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**LEDYARD HIGH SCHOOL TRACK AND FIELD  
RENOVATION PROJECT**

Ledyard, CT  
KBA #19016.00

Date: 10/3/19

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The following changes to the Project Manual shall become a part of the Drawings, Specifications, Bidding Requirements and Contract Documents; superseding previously issued Drawings, Specifications, Bidding Requirements, Contract Documents and Addenda, to the extent modified by this Addendum.

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**BID DATES (per addenda #1)**

- **BID OPENING: Thursday, October 10, 2019, 11:00 a.m.** (*October 3, 2019, 11:00 a.m.*) **No bids will be accepted after said date and time**
- **BIDDER INTERVIEWS: Friday October 11, 2019 and Monday October 14, Time TBD**

**CLARIFICATIONS**

Q: What type of resilient pad is specified, A 14 mm or a 17mm?

A: Per revised Specification 32 18 13 issued in this addendum, resilient pad shall be > 17mm and meet the performance criteria specified.

Q: Please specify the type of wire to be used on the 4' ht. Vinyl Coated chain link fence 9 GA or 6 GA?

A: *Replace Specification section 31 31 13 – Chain Link Fences and Gates with attached Specification section 31 31 13 – Chain Link Fences and Gates dated October 3, 2019. Chain link fence & fabric at fields shall be black vinyl coated (type 2b) with 9GA core.*

Q: Please provide a linear footage for the fence to be provided as part of Alternate.

A: *Per the alternate, the contractor is responsible for confirming the linear footage in the field, prior to submitting his bid.*

Q: Clarify the distance between fence posts, Specification calls for 8', details call for 10'?

A: *See revised Specification section 31 31 13 – Chain Link Fences and Gates dated October 3, 2019 attached. Spacing shall be 10' max.*

Q: Please clarify if Mapei PU2K is an acceptable Synthetic Turf adhesive.?

A: *Refer to requirements for synthetic turf carpet seaming in Specification Section 32 18 13 dated October 3, 2019. Acceptance of adhesive will be dependent on weather conditions at time of installation.*

Q: Alternate #1 – Turf sideline lettering: Drawings indicate a two-color text. Specifications list a three-color text. Please Clarify.

A: *Disregard colors listed in the specification. Side line text for this Alternate shall be two color: Navy Blue with White border.*

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Q: Field Utilities. Please Clarify.

A: *Contractor shall be responsible for providing all material, labor, and other items necessary to install utility conduits, utility boxes, com boxes, pull wires and items necessary for the complete infrastructure under the base bid. Base bid shall include an additional allowance of \$50,000 for the pulling and connection of electrical wiring.*

Q: Please clarify scoreboard connections under Alternate.

A: *New scoreboard shall include hard communication to the existing press box.*

Q: Modification to existing stairs, are handrails required?

A: *Yes, new handrails are required at all modified stair locations.*

Q: Can subsoil material removed from the track and field be used as ‘compacted earth fill’ as called out on Sheet C9.01 under the stabilization stone below the bleachers.

A: *Contractors may use inorganic materials removed from the track and field as ‘compacted earth fill’. Organic materials (other than topsoil) shall be removed and disposed of off-site by Contractor.*

## **CHANGES TO SPECIFICATIONS**

Section 31 31 13 Chain Link Fencing: Replace entire section with section 31 31 13 dated October 3, 2019

Section 32 18 13 Synthetic Grass Surfacing: Replace entire section with Section 32 18 13 Synthetic Grass Surfacing dated October 3, 2019

## **CHANGES TO DRAWINGS**

*Replace the attached sheets dated “9/6/2019 Bid Drawings” with drawings of the same title and number dated “10/2/2019 Addendum #2)*

C1.01	GENERAL NOTES, DRAWING INDEX AND LOCATION MAP
C2.01	EXISTING CONDITIONS PLAN
C3.01	SITE DEMOLITION PLAN
C4.01	SITE IMPROVEMENTS PLAN
C5.01	SITE GRADING PLAN
C6.01	STORMWATER MANAGEMENT PLAN
C7.01	SITE UTILITIES PLAN
C8.01	EROSION AND SEDIMENTATION CONTROL PLAN
C8.02	EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS
C9.01-C9.03	CIVIL DETAILS

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**ATTACHMENTS**

- (12) C-series drawing sheets as noted above.
- Section 31 31 13 Chain Link Fencing dated October 3, 2019
- Section 31 31 13 Chain Link Fencing dated October 3, 2019

END ADDENDUM #2

## SECTION 32 18 13 – SYNTHETIC GRASS SURFACING (ADDENDUM #2)

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The Contractor, Subcontractors, and/or suppliers providing goods and services referenced in or related to this Section shall also be bound by the Related Documents identified in Division 01 Section “Summary.”
- B. Specification Section 32 18 13.10 Synthetic Grass Surfacing Warranty.

#### 1.2 SUMMARY

- A. Section includes: Generally, installation of synthetic turf, over a resilient pad with infill consisting of a mix of coated crumb rubber and sand.
  - 1. Procurement and installation of synthetic grass surfacing.
  - 2. Procurement and installation of sand and coated rubber infill.
  - 3. Procurement and installation of Resilient pad.
  - 4. Pre and post installation testing of synthetic grass system.
  - 5. Warranty and maintenance requirements for the synthetic grass system.
  - 6. All incidental work items required to complete the work as shown on the Drawings and as called-for in the Specifications.
- B. Contractor shall coordinate work between all Contractors, sections, and trades required for the proper completion of the work. Carefully examine all of the Contract Documents for requirements which affect the work of this Section. The exact scope of work of this section cannot be determined without a thorough review of all Specification Sections and other Contract Documents.
- C. In all cases when conflicts exist between information contained in this Section and in other parts of the Contract Documents, Contractor shall assume that the more stringent and highest-performing solution is required.
- D. Contractor is responsible for all health and safety .
- E. It is the Owner intent to meet the requirements for FIFA Quality Pro, World Rugby, and FIH Multi-Sport Field at the completion of the installation and to meet the requirements for FIFA Quality, World Rugby, and FIH Multi-Sport for the life of the warranty period (8-years). *The field will not be required to be FIFA Certified or World Rugby at this time, but rather meet the requirements for all three organizations.*

#### 1.3 REFERENCES

- A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.

- B. American Society for Testing and Materials (ASTM)
  - 1. ASTM D 789 - Yarn Melting Point
  - 2. ASTM D 1335 - Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
  - 3. ASTM D 1577 - Standard Test Methods for Linear Density of Textile Fibers (Fiber Denier)
  - 4. ASTM D5034 – Standard Testing Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
  - 5. ASTM D5035 – Standard Testing Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
  - 6. ASTM D 2256 - Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method (Breaking Strength and Elongation)
  - 7. ASTM D 2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials (Flammability)
  - 8. ASTM D 3218 – Standard Test for Fiber Thickness (Microns)
  - 9. ASTM D422 Particle-Size Analysis
  - 10. ASTM D 4491 - Water Permeability of Geotextiles by Permittivity.
  - 11. ASTM F 355 - Standard Test Method for Impact Attenuation of Playing Surface Systems and Materials.
  - 12. ASTM F 1551 - Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials (for those not covered above)
  - 13. ASTM F 1632 - Particle Size Analysis and Sand Shape Grading of Golf Course Putting Green and Sports Field Rootzone Mixes
  - 14. ASTM F 1936 - Standard Specification for Impact Attenuation of Turf Playing Systems as Measured in the Field
  - 15. ASTM F2157 - Standard Test Method for Base Material Evenness
  - 16. ASTM F 2765 - Standard Specification for Total Lead Content in Synthetic Grass Fibers.
- C. National Federation of State High Schools (NFHS)
- D. Synthetic Turf Council Guidelines (STC)
- E. Connecticut Interscholastic Athletic Conference (CIAC)
- F. American Sports Builders Association (ASBA)

#### 1.4 DEFINITIONS

- A. Most terms used within the documents are industry standard. Certain words or phrases shall be understood to have specific meanings as follows:
  - 1. Provide: Furnish and install completely connected up and in operable condition.
  - 2. Furnish: Purchase and deliver to a specific location within the building or site.
  - 3. Install: With respect to equipment furnished by others, install means to receive, unpack, move into position, mount and connect, including removal of packaging materials.

4. Synthetic Turf Testing Agency (Testing Agency): Agency to perform testing on the synthetic turf system. All testing shall be done by a 3<sup>rd</sup> party testing agency. Performance testing and on-site testing shall be performed by an Agency currently holding certification by FIFA, World Rugby, and FIH.

## 1.5 SUBMITTALS

### A. Bid Submittals

1. Non-compliance with the bid submittal requirements as specified herein may result in rejection of the bid.
2. The following letters, on the synthetic grass surfacing manufacturer/vendor's letterhead and signed by an officer of the company, shall be submitted with the bid.
  - a. A letter shall confirm their intent to conform to all requirements set forth in the Bid Documents for the Synthetic Grass Surfacing System and qualified installation crew. Including, but not limited to, the Bid Drawings, Specifications, Addendum, and RFI Clarifications.
  - b. Manufacturer's Review of Synthetic Grass Surfacing: A letter confirming that the Bid Documents for the Synthetic Grass Surfacing System have been completely reviewed by qualified representatives of the materials manufacturer and that they are in agreement that the materials and system to be used for the synthetic grass field surfacing are proper and adequate for the applications shown and in no way impact the system warranty.
  - c. Sample manufacturer's warranty and maintenance requirements for the synthetic turf system proposed for this project.
3. The following letters, on the Resilient pad manufacturer/vendor's letterhead and signed by an officer of the company, shall be submitted with the bid.
  - a. A letter shall confirm their intent to conform to all requirements set forth in the Bid Documents for Resilient pad and qualified installation crew. Including, but not limited to, the Bid Drawings, Specifications, Addendum, and RFI Clarifications. Letter shall specifically confirm the ability to meet the resilient pad performance requirements set forth in this specification.
  - b. Manufacturer's Review of Synthetic Grass System A letter confirming that the Bid Documents for the synthetic turf system have been completely reviewed by qualified representatives of the materials manufacturer and that they are in agreement that the materials and system to be used are proper and adequate for the applications shown and in no way impact the pad warranty.
  - c. Sample manufacturer's warranty for the resilient pad proposed for this project.

B. Pre-Manufacturing Submittals

1. The intent of the pre-manufacturing submittal is for the synthetic turf manufacturer to provide the required documentation listed below for the manufacturer's standard system that most closely resembles the system specified and has been previously tested for conformance to the requirements below. The intent of this section is for manufacturers to provide a system that has been previously tested, not to require a manufacturer to conduct the required pre-manufacturing submittal testing on a non-standard system. *Systems that meet the requirements of this system and have been approved by FIFA should meet the requirements of this specification, with the possible exception of the infill material and resilient pad.*
2. Material Testing: Submit for approval test results for all material testing performed under "Quality Control Testing, Pre-Manufacturing" herein. Provide copies of all Testing Agency reports. **Testing shall be no more than 18 months old from date of submittal.**
3. Product Data: Submit manufacturer's general specifications and installation instructions for all products in the Synthetic Grass Surfacing System, including certifications and other data as may be required, to show compliance with the Contract Documents.
  - a. Material Safety Data Sheets (MSDS) sheets for all products and product components, as necessary. This shall include solvents and other products required as part of clean-up.
  - b. Certified Statement of the presences of toxic and or hazardous materials. Any toxic and/or hazardous material exceeding 100 parts per million (ppm) shall be identified in list form. The list shall reference the standard in name and threshold if applicable, and the test results. This requirement is above and beyond the requirements for MSDS.
  - c. Submit manufacturer's product data for the Resilient pad demonstrating compliance with this specification. Include manufacturer's written instructions and procedures for each product.
4. Material Samples: Submit two (2) samples for approval for all materials under 2.1 Materials including, but not limited to, the following:
  - a. Synthetic Grass Surfacing Fiber: Provide samples for each color used for the field, markings, and logos.
  - b. Synthetic Grass Samples: Twelve-inch (12") square samples of un-filled synthetic grass for each color used for the field. The samples shall be the manufacturer's standard product that most closely resembles the specified system and is to be reviewed as the general product intended for use on the field. Manufacturer shall note any discrepancies between the standard product sample submitted and the product to be manufactured for this project.

- c. Seaming Materials: Twelve-inch (12") long samples of all materials to be used for seaming of the synthetic grass turf system including, but not limited to, glue and seaming tape.
  - d. Synthetic Grass Surfacing Infill: One-pound samples of sand and coated rubber (in separate bags).
  - e. Resilient Pad Sample: Twelve-inch (12") square samples of resilient pad.
5. Shop Drawings: Submit for approval the following:
- a. Seaming plan; Seams of the field shall not coincide with the subsurface drain system nor seams of pad (if applicable).
  - b. Field Marking Layout, including logos. Layouts for all sports shown on the Drawings showing any field lines, markings, boundaries on the appropriate field(s) and all specified colors. All markings shall be tufted in the factory or inlaid. Provide certification that field layouts meet all NFHS and CIAC sport marking requirements as installed in the field.
  - c. Details on field construction, making special note of any details that may deviate from the Drawings or Specifications. Include: edge detail, goal post detail, covers for access to subsurface structures, other inserts, etc.
6. Warranties: Submit a draft copy of the warranties in Owner's name for all products furnished under this section for review and approval.
7. Testing Agency: Submit qualification of testing agency(s) for review and approval.
8. Synthetic grass surfacing manufacturer/vendor and installer qualifications:
- a. Installer Qualifications: Synthetic Grass Installation Sub-Contractor shall certify in writing the designated supervisory personnel on the project are competent in the installation of the all-weather grass material, including gluing or sewing seams and proper installation of the infill mixture. The synthetic grass surfacing installer shall have a representative on-site to certify the installation and warranty compliance. Provide experience to show that installation crew is competent to complete the level of work outlined in this project. Synthetic Grass Installation Sub-Contractor's superintendent shall demonstrate experience that the superintendent is competent to oversee and complete the level of work outlined in this project.
  - b. At a minimum, provide the following documentation: Fifteen (15) reference projects consisting of Synthetic Grass Multi-Sport Grass Fields of 75,000 square-feet or larger within the past five (5) years completed by the proposed on-site full-time installation superintendent.

- c. Project Information: At a minimum, provide the following information for each reference project:
            - 1) Project Name
            - 2) Project Location
            - 3) Project scope
            - 4) Construction timeline
            - 5) Construction cost
            - 6) Reference name, title, affiliation, and contact information.
  9. Resilient Pad:
    - a. Resilient pad manufacturer/vendor and installer qualifications:
      - 1) Installer Qualifications; Resilient pad Installation Sub-Contractor shall certify in writing the designated supervisory personnel on the project are competent in the installation of the Resilient pad material. The Resilient pad installer shall have a representative on-site to certify the installation and warranty compliance. Provide experience to show that installation crew is competent to complete the level of work outlined in this project. Resilient pad Installation Sub-Contractor's superintendent shall experience to demonstrate that the superintendent is competent to oversee and complete the level of work outlined in this project.
      - 2) At a minimum, provide the following documentation: Fifteen (15) reference projects consisting of Resilient pads of 75,000 square-foot or larger within the past five (5) years completed by the proposed on-site full time installation superintendent.
      - 3) Project Information: At a minimum, provide the following information for each reference project:
        - a) Project Name
        - b) Project Location
        - c) Project scope
        - d) Construction timeline
        - e) Construction cost
        - f) Reference name, title, affiliation, and contact information.
  10. Field Maintenance Equipment:
    - a. 2.1 Materials, H. Field Maintenance Equipment
  11. Field Attic Stock
    - a. 2.1 Materials, G. Attic Stock
  12. Surveyor: Submit name and qualifications of Professional Land Surveyor who will be responsible for layout and verification of the work of this Section.
- C. Post Manufacturing/Pre-Installation Submittals
  1. Material Testing: Submit for approval test results for all material testing performed under "1.8 Quality Control Testing, Post-Manufacturing/Pre-Installation" herein. Provide copies of all testing agency reports.

2. Material Samples: Submit two (2) samples, with required testing data, for approval for all materials under 2.1 Materials including, but not limited to, the following:
  - a. Synthetic Grass Carpet Sample: Twelve-inch (12") square samples of un-filled synthetic grass for each color manufactured for the project. Samples shall be the same as samples send to the testing agency for conformance of the product declaration.
  - b. Synthetic Grass System Sample: Sample box of synthetic grass system, including infill material.
3. Acceptance of Prior Work: Refer to section 3.2 Examination.

D. Post-Installation Submittals

1. Material Testing: Submit for approval test results for all material testing performed under "1.8 Quality Control Testing, Post-Installation" herein. Provide copies of all testing agency reports.

E. Warranty Quality Control Submittals

1. Material Testing: Submit for approval test results for all material testing performed under "Quality Control Testing, Warranty" herein. Provide copies of all testing agency reports to the Owner and Landscape Architect for review and approval for the entire warranty period.

1.6 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. The Owner, or Landscape Architect on the Owners behalf, reserves the right to submit any material, either before or after installation, for testing it deems necessary to satisfy the conditions of this contract.
  1. Any material tested and found not in compliance with the contract will be rejected and replaced with material conforming to the specifications. This will be done at the sole expense of the Contractor.
  2. Any testing performed by the Owner will be at the Owner's expense. The Contractor is responsible for the cost of all testing that fails. Contractor will bear the cost of all retesting as required by the Owner.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Schedule delivery to minimize on-site storage. Segregate differing materials and prevent from contamination with other materials.

- B. Packing and Shipping: Deliver products in original unopened packaging with legible manufacturers' identification. All materials shall be stored in a dry place out of the direct sunlight.
  - C. Resilient pad
    - 1. Follow manufacturer's recommendations for packaging, transportation, and delivery to ensure materials are not damaged. Furnish materials in wrapping that protects the material from ultraviolet radiation and from abrasion due to shipping and hauling.
    - 2. Materials shall be stored on a prepared surface. Protect materials from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat or cold, or other damaging circumstances.
  - D. Prior to the installation of any materials and immediately upon delivery of the synthetic grass system and components to the project site, the Contractor shall inspect materials as follows:
    - 1. For damaged or defective items.
    - 2. Measure synthetic grass roll lengths, perforations, and uniformity.
    - 3. Adhesives and seaming tap shall arrive in sealed dry containers and be kept in adequate temperature per manufactures requirements.
    - 4. Rubber in-fill shall arrive in large sacks or bags without tears and loose material.
    - 5. Rubber in-fill shall arrive dry and loose. No Rubber shall be accepted that is bulked or solid.
    - 6. Rubber in-fill shall be free of exposed metal particles.
    - 7. Sand in-fill shall be free from contamination of site materials.
  - E. Bulk Materials: Deliver materials in clean, washed and covered trucks to eliminate contamination during transportation. On site stockpiling locations to be coordinated with the Owner. Stockpile only in areas free of debris and away from drainage routes. Cover all materials with plastic or geotextile if materials are to be stockpiled more than 48 hours.
- 1.8 QUALITY CONTROL TESTING

- A. All sampling/testing shall be the responsibility of Contractor. Contractor shall retain and pay for the services of a third-party Testing Agency to perform all sampling/testing in accordance with applicable standards.
- B. All testing shall be completed by an independent (third-party) Testing Agency as approved by Landscape Architect. Testing must be for current materials with current date from independent testing laboratory as described herein.
- C. Certified copies of laboratory reports shall be submitted for all testing.
- D. **Pre-Manufacturing Testing**
  - 1. The intent of the pre-manufacturing testing is for manufacturers to submit the required testing for a previously tested **standard materials and systems** that most closely resembles the specified system. Manufacturer shall note any discrepancies between the

standard **materials and systems** previously tested and the system proposed for this project, if any.

a. *IT IS NOT THE INTENT OF PRE-MANUFACTURING TESTING SECTION TO REQUIRE MANUFACTURERS TO ENGAGE IN TESTING OF MATERIALS OR SYSTEMS NOT PREVIOUSLY TESTED AFTER BIDS HAVE BEEN RECEIVED.*

- 1) *PREVIOUS TESTING SHALL NOT BE DATED OVER TWO (2) YEARS FROM DATE OF BIDDING.*
- 2) *MANUFACTURERS WITHOUT A PREVIOUSLY TESTED SYSTEM CLOSELY RESEMBLING THE SPECIFICATION SHALL NOT BE CONSIDERED FOR THIS PROJECT.*

2. Timing: Contractor shall submit to Landscape Architect a copy of all test results certified by the independent Testing Agency prior to manufacturing of the Synthetic Grass Surfacing for the Project. Provide testing data for the following:

TESTING METHOD	CHARACTERISTIC	DECLARATION
<b>SYNTHETIC GRASS YARN (include results for each yarn color separately)</b>		
<b>(provide previous results for testing of product that closely meets specification)</b>		
ASTM D1907/ FIFA Test Method 23	Fiber Denier (Dtex)	< +/- 10%
ASTM D3218/ FIFA Test Method 25	Fiber Microns	< +/- 10%
FIFA Method 22	Pile Yarn Characteristic	Same Polymer
ASTM D 789	Melting Point	> 235 degrees F
ASTM D 5034	Breaking Strength (length)	> 283 lbs./ ft.
ASTM D 5034	Breaking Strength (width)	> 200 lbs./ft
ASTM F 2765-09	Lead Content	< 50 ppm
<b>Artificial Weathering (FIFA 10)</b>		
EN ISO 20105-A02	Artificial Weathering (5,000 hours UVA) Turf Color Change	> Gray Scale 3
EN 13864	Artificial Weathering (5,000 hours UVA) Pile Yarn Tensile Strength	<50% reduction
<b>SYNTHETIC GRASS INFILL MATERIALS</b>		
<b>(include results for each infill material separately)</b>		
<b>(provide previous results for testing of product that closely meets specification)</b>		
EN 71-3	Safety of Toys Part 3	Pass
ASTM F3188	Safety of Synthetic Turf Infill	Pass
EN 933/ FIFA Test Method 20	Particle Size	Max. 1 sieve difference
EN 14955	Particle Shape	Same Shape
EN 1097-3	Bulk Density	± 15% of specification
EN ISO 20105-A02	Artificial Weathering (5,000 hours UVA) Polymetric Infill Color Change	> Grey Scale 3, no change in shape

TESTING METHOD	CHARACTERISTIC	DECLARATION
<b>RESILIENT PAD</b>		
<b>(previous results for testing of product that closely meets specification)</b>		
EN 1969	Thickness	>17 mm
ASTM F355-A/F1936	Impact Attenuation(g-max)	< 110 G's
EN 1177	Impact Attenuation, Head Injury Criteria (HIC)	0.9
EN 14809/ FIFA 05a&15	Vertical Deformation	4.5mm to 6mm
EN 14808/ FIFA 04&09	Force Reduction	55% to 70%
ASTM F1551/EN 12616 (FIFA Method 24)	Water Infiltration Rate	>50 in./hr. vertically
Thermal Expansion (per 1°C)	ASTM D696-03	<.0.1mm/M
Compression Strength	ASTM D3575	> 25 psi @ 25% > 40 psi @ 50%
Compression Set – Static Load (35psi for 30 min at 23°C after 24 hrs)	ISO 1856C	<7.5% max
Microbiological Analysis Bacteria Resistance, Fungal Resistance Chemical resistance	ASTM G22-76 ASTM G21-96 ASTM F925	No growth or detrimental effects
Accelerated Aging 20 yr model - % tensile strength loss 20 yr model - % elongation loss		-<10% after 120 days @ 85C -<5% after 120 days at 85C
<b>SYNTHETIC GRASS SYSTEM</b>		
<b>(provide previous results for testing of product that closely meets specification)</b>		
ASTM D5848/ISO 2549	Pile Height (Pile Length Above Backing)	<5%
ASTM D5793	Stitch Gauge	< 3/8"
ISO 1763	Tufts per Unit Area/Knots per Woven Area	
ASTM D5848/ISO 8543	Pile Weight	< +/- 5% of product declaration
ASTM D5848	Total Weight	
ASTM D1335/ISO 4919	Turf Bind (withdrawal)	.30N (unaged)
EN 13744 & ASTM D1335/ISO 4919	Turf Bind (withdrawal)	.30N (after immersion in hot water)
EN 1969/ FIFA Test Method 18	Free Pile Height	< ½" Fiber Reveal
EN 13746	Dimensional Stability	>0.5% After Each Stage
EN 1969/ FIFA Test Method 21	Infill Depth	< ½" Fiber Reveal
EN 12228 Method 1	Joint Strength – unaged	1000N/100mm (bonded)
EN 13744 & EN 12228 Method 1	Joint Strength – after immersion in hot water	1000N/100mm (bonded)
EN 13672	Lisport XL Simulated Wear (can be equivalent yarn on similar system)	> 6,000 passes without splitting

ASTM F1551/EN 12616 (FIFA Method 24)	Water Infiltration Rate	>16 in./hr. (>180mm/h2)
ASTM F355-A/F1936	Impact Attenuation(g-max)	< 100 G's
EN 1177	Impact Attenuation, Head Injury Criteria (HIC)	<900 @ 1.4m
EN 14808/ FIFA 04&09	Force Reduction	55% to 70%
EN 14809/ FIFA 05a&15	Vertical Deformation	4mm to 11mm
EN 15301/ FIFA 06&15	Rotational Resistance	27n to 48n

3. Any system material previously tested and found not in compliance with the contract may be rejected and Contractor shall submit a material found to be acceptable.
4. The Owner, or Landscape Architect on the Owner behalf, reserves the right to independently test any material. Any testing performed by the Owner will be at the Owner's expense. The Contractor is responsible for the cost of all testing that fails. Contractor will bear the cost of all retesting as required by the Owner.
5. The approved testing results shall be referred to as the 'manufacturers declaration' for the remainder of this section.

E. Post Manufacturing/Pre-Installation Material Identification Testing

1. Samples, as required to perform the testing below, of the materials manufactured for this project shall be submitted to the independent Testing Agency.
2. Timing: Contractor shall submit to Landscape Architect a copy of all test results certified by the Independent Testing Agency prior to shipping of the Synthetic Grass System materials to the Project. Provide testing data for the following:

<b>PRODUCT IDENTIFICATION - SYNTHETIC GRASS SURFACING CARPET</b>		
ISO 8543	Total Mass Per Unit Area	< 5%
ISO 1763	Tufts per Unit Area/Knots per Woven Area	<10% manufacturers declaration
ISO 4919	Turf Withdrawal Force	>95% of manufacturers declaration
ASTM D5848/ISO 2549	Pile Height (Pile Length Above Backing)	<5%
ASTM D5848/ISO 8543	Pile Weight	> 95%
ASTM D 1335	Tuft Bind (w/out infill)	> 6.8 lbs. or 30N
ASTM D 5848	Primary Backing Weight	± 2 oz./yd2 of manufacturers declaration
ASTM D 5848	Secondary Backing Weight	± 2 oz./yd2 of manufacturers declaration
Visual	Perforations	>3/16" dia. holes, spaced 4" on center
<b>PRODUCT IDENTIFICATION – PILE YARN</b>		
ASTM D 1907/FIFA Test Method 23	Denier (Dtex)	± 5% of manufacturers declaration

ASTM D 3218/FIFA Test Method 25	Microns	± 5% of manufacturers declaration
<b>PRODUCT IDENTIFICATION – INFILL (for each infill material)</b>		
EN 933/ FIFA Test Method 20	Particle Size	Max. 1 sieve difference
EN 14955	Particle Shape	Same Shape
EN 1097-3	Bulk Density	± 10% of manufacturers declaration
<b>PRODUCT IDENTIFICATION – RESILIENT PAD</b>		
	Composition	Similar Composition
EN 1969	Thickness	>90% of manufacturers declaration
EN 12230	Tensile Strength	0.15MPa

3. Any material tested and found not in compliance with the contract may be rejected and Contractor shall submit a material found to be acceptable.
4. The Owner, or Landscape Architect on the Owner behalf, reserves the right to independently test any material. Any testing performed by the Owner will be at the Owner's expense. The Contractor is responsible for the cost of all testing that fails. Contractor will bear the cost of all retesting as required by the Owner

F. Post Manufacturing/Pre-Installation Performance Testing

1. Samples, as required to perform the testing below, of the synthetic grass carpet, infill material, and resilient pad system shall be submitted to the Independent Testing Agency.
2. Timing: Contractor shall submit to Landscape Architect a copy of all test results certified by the Independent Testing Agency prior to shipping of the Synthetic Grass System materials to the Project. Provide testing data for the following:

<b>SYNTHETIC GRASS SURFACING SYSTEM (carpet, infill, and resilient pad)</b>		
EN 1969/ FIFA Test Method 18	Free Pile Height	< ½” Fiber Reveal
	Infill Ratio	
ASTM F1551/EN 12616	Water Infiltration Rate	>16 in./hr.
ASTM F 1936	Impact Attenuation(g-max)	< 100 G’s
EN 1177	Impact Attenuation, Head Injury Criteria (HIC)	<900 @ 1.4m
EN 14808/ FIFA 04&09	Force Reduction	55% to 70%
EN 14809/ FIFA 05a&15	Vertical Deformation	4mm to 11mm
EN 15301/ FIFA 06&15	Rotational Resistance	27n to 48n
EN 12235/ FIFA 01&15	Vertical Ball Rebound	60cm to 100cm
EN 12234/ FIFA 17 & 15	Reduced Ball Roll	4m to 10m

FIFA 02	Angle Ball Rebound	45% - 70%
FIFA 04a & 15	Shock Absorption	57% - 68%

3. Any material tested and found not in compliance with the contract may be rejected and Contractor shall submit a material found to be acceptable.
4. The Owner, or Landscape Architect on the Owner behalf, reserves the right to independently test any material. Any testing performed by the Owner will be at the Owner's expense. The Contractor is responsible for the cost of all testing that fails. Contractor will bear the cost of all retesting as required by the Owner.

G. Drainage Testing, Pre-Construction

1. Refer to Specification Section 33 46 16 Field Subdrainage System for testing and approval requirements of the synthetic turf field base.
2. Synthetic turf system installer shall submit pre-installation base acceptance letter.

H. Post-Installation Testing

1. Timing: Testing shall be completed on-site and within five (5) days of the completion of installation.
2. Contractor shall submit to Landscape Architect a copy of all test results certified by the independent Testing Agency. Provide testing data for the following:

<b>DRAINAGE STONE</b> (installed on-site, prior to installation of resilient pad)		
SEE SPECIFICATION SECTION 33 46 16 'FIELD SUBDRAINAGE SYSTEM'		
<b>SYNTHETIC GRASS SURFACING SYSTEM</b> (installed on-site, after installation of synthetic grass surfacing, infill, and resilient pad)		
ASTM F1551/EN 12616	Water Infiltration Rate	>16 in./hr. (1 test per 20,000 s.f.)
EN 1969/ FIFA 21	Infill Depth Measurement	± 10% of specification (any location, <b>not average</b> )
EN 13036/FIFA 12	Planarity/Surface Regularity	<10 mm
ASTM F 1936	Impact Attenuation(g-max) (minimum 10 locations)	< 95 G's ( <b>any location, not average</b> )
EN 1177	Impact Attenuation, Head Injury Criteria (HIC) (minimum 10 locations)	<900 @ 1.4m ( <b>any location – not average</b> )
EN 14808/ FIFA 04a	Shock Absorption	55% to 70%
EN 14809/ FIFA 05a	Vertical Deformation	4mm to 11mm
EN 15301/ FIFA 06	Rotational Resistance	25n to 50n
EN 12235/ FIFA 01	Vertical Ball Rebound	60cm to 100cm
EN 12234/ FIFA 03	Ball Roll	4m to 10m

EN 71-3	Safety of Toys Part 3	Pass (minimum of 3 samples)
ASTM F3188	Safety of Synthetic Turf Infill	Pass (minimum of 3 samples)

3. Any material tested and found not in compliance with the contract may be rejected and Contractor shall rectify the issue to be acceptable. Any area/item not within conformance shall be retested at the Contractors expense after remedy is implemented until satisfactory results are achieved.
4. The Owner, or Landscape Architect on the Owner behalf, reserves the right to independently test any material. Any testing performed by the Owner will be at the Owner's expense. The Contractor is responsible for the cost of all testing that fails. Contractor will bear the cost of all retesting as required by the Owner.

**I. Warranty Testing**

1. Timing: Testing shall be completed on-site and annually for the warranty period.
2. Contractor shall submit to Landscape Architect a copy of all test results certified by the independent Testing Agency. Provide testing data for the following:

<b>SYNTHETIC GRASS SURFACING SYSTEM (annually)</b>		
EN 13036	Planarity/Surface Regularity	<10 mm
EN 1969	Infill Depth Measurement	± 10% of specification (1/2" exposed fiber) (any location, not average)
ASTM F 1936	Impact Attenuation(g-max) (minimum 10 locations)	< 100 G's (individual locations, not average field results)
EN 1177	Impact Attenuation, Head Injury Criteria (HIC) (minimum 10 locations)	<900 @ 1.4m (individual locations, not average field results)
EN 71-3	Safety of Toys Part 3	Pass (minimum of 3 samples)
ASTM F3188	Safety of Synthetic Turf Infill	Pass (minimum of 3 samples)

3. Any materials tested and found not in compliance with the warranty requirements shall be rectified at Contractors expense. Contractor shall rectify the issue to be acceptable and pass all warranty testing requirements. Any area/item not within conformance shall be retested at the Contractors expense after remedy is implemented until satisfactory results are achieved.

1.9 PATENT RIGHTS AND INFRINGEMENT

- A. The Drawings and Specifications are not indented to be proprietary or in violation of any current or pending patents. The Contractor and subcontractors are responsible to provide the Owner and Landscape Architect with any violations contained here in prior to bidding. By bidding on the project, the Contractor and subcontractors shall hold the Owner, Construction Manager, and Design Consultants harmless from infringement of any current or future patent issued for the synthetic grass surfacing system.
- B. Contractor and subcontractors shall hold the Owner, Construction Manager, and Design Consultants harmless from infringement of any current or future patent issued for the synthetic grass surfacing system, fibers, backings, including resilient pad (if required), installation methods and vertical draining characteristics. The successful bidder will be required to submit a letter for consent from their surety. The Surety shall indemnify the requirements.
- C. There are various established performance criteria throughout this 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 which 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, Construction Manager, and Design 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, Construction Manager, and Design 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.

#### **1.10 WARRANTY**

- A. Synthetic Grass Surfacing Warranty – Sports Fields: See Specification Section 32 18 13.10 Synthetic Grass Surfacing Warranty.
- B. Synthetic Grass Infill Warranty
  - 1. The Infill Material Manufacturer shall provide a non-prorated Manufacturer/Installer Warranty/Guarantee (also referred to herein as the Warranty) for the synthetic grass infill materials and installation as specified herein, for a minimum non-pro-rated period of eight (8) years to the Owner from the date of Certificate of Substantial Completion.
  - 2. Infill material shall be warrantied against breakdown of material outside of project specifications, deterioration of infill coatings, and failure to adhere to EN 71-3 and ASTM F3188 testing.
- C. Resilient pad Warranty's
  - 1. The Resilient Pad Manufacturer shall provide a non-prorated Resilient pad Manufacturer/Installer Warranty/Guarantee (also referred to herein as the Warranty) for the Resilient pad materials and installation as specified herein, for a minimum non-pro-

rated period of sixteen (16) years to the Owner from the date of Certificate of Substantial Completion.

2. Warranty shall include coverage for the following:
  - a. Drainage issues or failure to drain at rate of 50" per hour or greater.
  - b. Undulations or heaving repair for any undulation caused by the padding material apparent in the turf over 10mm vertical height, whether periodic (due to weather) or persistent.
  - c. Persistent depressions, or deformation of the pad material 10 mm or greater caused by the resilient pad materials.
  - d. Any failure in the physical properties of the resilient pad that negatively affect the aesthetics, playability, G-Max rating, HIC rating, or longevity of the synthetic turf of the athletic field.
  - e. Costs for repair or replacement of the synthetic turf and infill above the resilient pad in affected areas in the event of product failure.
- D. The Warranties shall cover, in general, the usability of the Synthetic Grass System: accessories, use, characteristics, and suitability, of the installation to the minimums specified in this Section.
- E. All items covered by the warranty are to be replaced or repaired with new materials, including installation at the sole expense of the warranting material manufacturer/supplier over the life of the Warranty.
- F. Sports Field Synthetic Grass System Use: The materials utilized in the sports field synthetic grass system (carpet, infill, resilient pad, seaming, logo's, inlays, etc.) shall be guaranteed for the designated uses as follows:
  1. Football, Rugby, Soccer, Baseball, Softball, Field Hockey, Lacrosse
  2. Marching Band
  3. Graduations and Ceremonies
  4. Physical Education and Intramural Sports Programs
  5. Physical Education exercises and activities
  6. Pedestrian traffic and other similar uses
  7. Pneumatic rubber-tired maintenance and service equipment, designed for use on athletic fields and golf courses.
- G. Warranty documents and terms of Warranty shall be in accordance with this Specification.
  1. The use of the Manufacturers' standard or modified form of Warranty shall in no circumstance supersede the conditions set forth in this Specification Section, which shall be considered part of the Warranty.
  2. This Warranty shall constitute a contract made in the State of where the project is located and shall be governed by the laws of that State.
- H. All Warranties shall include coverage for the following:

1. Drainage issues, or failure to drain at the specified rate.
  2. Any failure in the physical properties that negatively affect the aesthetics, playability, G-Max rating, HIC rating, or longevity of the synthetic grass.
- I. Test results, field repairs, and field concerns shall be submitted to the Owner and the Landscape Architect in a Field Inspection Report and Testing Results for review.

#### 1.11 WARRANTY AND MAINTENANCE OBLIGATIONS

1. The Synthetic Grass Manufacture/Supplier shall be required to provide testing, as described under G. Warranty Testing, and inspection plan for the lifespan of the warranty as part of this Contract and shall submit a schedule of visits at the time of completion.
  - a. Contractor shall make corrections as necessary to meet all testing requirements.
2. The Synthetic Grass Manufacture/Supplier to return to the site once (1) per year for the duration of the warranty, no less than 8 visits.
3. The Synthetic Grass Manufacture/Supplier shall inspect any areas of concern and make repairs as necessary under warranty during each visit including, but not limited to, the following:
  - a. Nailer Board/Concrete Anchor Cub Repairs (general contractor)
  - b. Inlays, Numbers, Logo, and Seam Conditions
  - c. Fiber Conditions
  - d. Fiber Height
  - e. Infill Condition
  - f. Infill Height/ Compaction
  - 1) Sports Fields: Additional infill may be required by the Contractor to maintain the G-Max, HIC levels and required infill depths.
4. Test results, field repairs, and field concerns shall be submitted to the Owner and the Landscape Architect in a Field Inspection Report and Testing Results for review.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. Resilient Pad/Shock Pad

1. Commercially available panelized/modular resilient pad system designed for multi-sport uses. Resilient pad shall consist of prefabricated, interlocking units configured for installation beneath a synthetic turf system.
2. Compatibility: Resilient pad shall be compatible with the submitted synthetic grass surfacing and the infill material. The grass surfacing and pad shall provide an acceptable system. Resilient pad shall be in all ways compatible with the specified grass surfacing

and infill, and shall not affect the synthetic grass warranty, as well as the grass surfacing submitted shall not affect the pad warranty. Pad shall be intended for installation on a gravel base without the use of adhesives or separation fabric.

3. Load Capacity: No permanent deformation under periodic loading (e.g. grooming equipment, or ambulance).
4. Connectors, couplers, and other fittings shall not be required to connect resilient pad panels. Material of construction and configuration shall be in accordance with the resilient pad manufacture’s requirements or recommendations, whichever is more stringent.
5. Warranty: Minimum 16-year manufacturer's warranty.
6. Resilient pad performance requirements:

<b>Resilient Pad</b>		
<b>Characteristic</b>	<b>Testing Method</b>	<b>Requirements</b>
Material Thickness	>17 mm (0.55 inch) +/-0.18 inch	
Format / Type	Sheet/ Interlocking panels	
Drainage / Permeability	ASTM F1551:DIN 18-035 part 6	Perforated or Permeable 50 inches per hour minimum
<b>PERFORMANCE CRITERIA</b>		
SEE SECTION 1.8 QUALITY CONTROL TESTING, D. Pre-Manufacturing Testing		

7. Manufacturer shall provide documentations that the Resilient pad meets the following:
  - a. Product meets human health and total threshold limit concentrations using EPA method 3052
  - b. Product meets human health and total threshold limit concentrations for Title 22 (CAM 17) metals using EPA 6010B/7471A and hexavalent chromium using EPA method 7196A.

**B. Synthetic Grass Surfacing Carpet**

1. All components and their installation method shall be designed and manufactured for use on outdoor athletic fields. The finished surface shall resist abrasion and cutting from normal use.
2. 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, heat degradation, and be non-allergenic and non-toxic. The entire system shall be constructed to maximize dimensional stability, to resist damage and normal wear and tear from its designated uses and to minimize the ultra-violet degradation.
3. The system shall have the basic characteristics of flow-through drainage, allowing free movement of surface runoff through the synthetic grass system where such water may flow to the existing base and into the field drainage system.

4. Pile fibers shall resemble freshly grown natural grass in appearance, texture and color (except as noted for markings and graphics). Streaks, discoloration, or different dye lots shall not be accepted.
5. Manufacturer is to guarantee that the synthetic grass fiber is adaptable to painted lines.
6. The synthetic grass surfacing systems shall be a proven athletic caliber yarn designed specifically for outdoor use and stabilized to resist the effect of ultraviolet degradation, heat, foot traffic, water, and airborne pollutants.
7. All adhesives used in bonding the system together shall be resistant to moisture, bacterial and fungus attacks, and resistant to ultra-violet rays at any location upon installation.
8. Fabric surface shall be constructed and installed in minimum widths of 15 feet with no longitudinal or transverse seams, except for inlaid lines with a finished roll assembly.
9. The Synthetic Grass System shall remain free draining at all times before, during, and after the infill materials are installed.
10. The synthetic grass surfacing shall be made up of the following systems:
  - a. Multi-Sport Field – Tufted combination of Diamond Shaped Monofilament and Slit-Film, and thatch fibers.
  - b. The intent of the system is for manufacturers to utilize a standard system that most closely resembles the specified system. Refer to Section 1.8 Quality Control for system performance and safety requirements.
  - c. *IT IS NOT THE INTENT OF THE PRE-MANUFACTURING TESTING SECTION TO REQUIRE MANUFACTURERS TO ENGAGE IN TESTING OF SYSTEM NOT PREVIOUSLY TESTED BETWEEN THE TIME OF BID AND MANUFACTURING.*  
*1) MANUFACTURERS WITHOUT A PREVIOUSLY TESTED SYSTEM CLOSELY RESEMBLING THE SPECIFICATION SHALL NOT BE CONSIDERED FOR THIS PROJECT.*

**Synthetic Turf Carpet Properties:**

Denier	9,000 (mono & slit-film) 5,000 (thatch/rootzone/spikezone)
Microns	310 microns (mono) 120 microns (slit-film)
Pile Height	2 inches
Pile Weight (Total)	60 oz.
Stitch Gauge	< 3/8"

C. Perforations

1. Synthetic grass carpeting shall be perforated to provide vertical drainage as specified herein.
2. Size and spacing of perforations shall be as specified herein. Spacing of perforations shall be uniform in both directions.

3. Perforations shall be complete and full diameter for a minimum of 95% of each roll.
4. Perforations shall be tested by passing a 3/8" drill bit through the holes with no more than 7 lbs. pressure.

D. Markings and Logos

1. All field lining, marking, field boundary system with team area limits, logos, etc. shall be same material (yarn, infill, and backing) as playing field system.
2. Lines, logos, and graphics to be installed on the synthetic grass surface as per documents are to be tufted in the factory to the maximum extent practical. Those not tufted in the factory shall be inlaid in the field (**shaving is not permitted**).
3. A complete field lining, marking, and field boundary system with team area limits, etc. shall be provided with the initial installation. Layouts shall be accurately surveyed and marked prior to installation. Layouts shall include all incidental markings required by the NFHS or state athletic organization, whichever is applicable.
4. All markings shall be uniform in color, providing a sharp contrast with the synthetic grass field color and shall have sharp and distinct edging.
5. Logos and lines shall be true and shall not vary more than 1/2" from specified width and location.
6. Turf Graphics (other than field lining)
  - a. Base Bid Field Graphics: (See drawings for detail and location)
    - 1) Three color Centerfield logo
    - 2) Navy Blue color safety run-out areas/Border
  - b. Alternate Field Graphics: (See drawings for detail and location)
    - 1) Two color 'COLONELS' text at center of each sideline (see drawings for detail and location)

E. Adhesive Materials and Seaming Tape

1. Adhesive material to fix the synthetic grass carpet to the seaming tape shall be a polyurethane adhesive:
  - a. NORDOT Adhesive by Synthetic Surfaces Inc.
  - b. Turfbond Synthetic Turf Adhesive
  - c. Mapei Ultrabond Turf PU Single Component Adhesive
2. If a hot melt welding method is used, the glue shall have an application temperature of 325 degrees F. with a melting point of 180 degrees F. Material shall be National Adhesive #34-5372 or equal. Submission of all hot melts shall be 10 calendar days prior to installation.
  - a. **Hot melt shall not be used to adhere synthetic turf carpet to concrete anchor curbing.**

3. Bonding surfaces shall be clean, dry, and free from grease, oil, wax, weak oxide films, mold release agents, and other surface contaminants.
4. The adhesive shall be applied at the rate not to exceed 60 square feet per gallon.
5. The adhesive shall have the same warranty period as the synthetic grass system.
6. Seaming tape shall be a 12" wide polypropylene or polyethylene fabric acceptable for use with the synthetic turf carpet system and the adhesive material.
7. Seaming tape shall meet FIFA Joint Strength >25N/100mm
8. **Sewn seams are not acceptable.**

F. Infill

1. Infill Materials shall be uniformly filled to a depth which leaves no more than 1/2" of exposed pile after settlement.
  - a. Infill materials shall consist of a homogeneous non-compacting mixture of silica sand and recycled rubber granules meeting the following criteria: Combination of sand and coated ambient crumb rubber (SBR) are to be used as the in-fill system, the green coated crumb rubber content shall be between approximately 30-40% by weight and the sand shall be between 60-70% by weight. Manufacturer to provide infill ration based on pre-installation testing.
  - b. Coated Ambient Crumb Rubber Infill
    - 1) Shall be free of all metal and produced of 100% recycled automobile or truck tires. The material shall have a size not to exceed 10 mesh nor smaller than 20 mesh.
    - 2) The fine particles shall not exceed 10% by volume. Rubber shall have no visible evidence of steel particles present in the final synthetic grass surfacing in-fill. The bulk density of the rubber materials shall not be less than 29.75 lbs/cubic feet.
      - a) Coating color: **GREEN**
    - 3) Coated ambient crumb rubber shall be UV stabile and resistant to heat degradation.
  - c. Sand Infill
    - 1) Sand shall comprise 100% passing the #16 sieve, no more than 80% passing the #30 sieve and no more than 0.5% passing the #50 sieve per ASTM E-1.

G. Additional Field Materials (Attic Stock)

1. Sports Fields:
  - a. The Contractor shall supply and deliver an additional 50 lineal feet of full width (15') material, plus 5 linear feet of full width of each color used. Scraps left from the installation process are not acceptable.

- b. The Contractor shall supply and deliver an additional 2,000 lbs crumb rubber material as specified for the sports field synthetic grass surfacing system. *The rubber infill shall be placed in RubberMaid 50 gallon containers with lockable covers and wheels and clearly labeled "FIELD INFILL".*
- 2. Seaming Tape and Adhesive: Provide 25' linear feet of seaming tape and sufficient gluing materials necessary for seaming repair. Materials shall be easily used by the Owner.**
- a. **5 Gallon pails of glue material are not acceptable.**
- H. Field Maintenance Equipment
1. Contractor shall provide one (1) complete set of grooming equipment to the Owner.
    - a. Synthetic Grass Groomer:
      - 1) One (1) new and unused GreensGroomer® 926 Integrated Synthetic Turf Groomer or approved equal. The synthetic grass groomer shall be a towable, non-motorized unit measuring 72" wide by 72" long, (not including the draw bar), that is transported on 2 pneumatic tires and incorporates an electric lift for raising and lowering. Including the rear finishing brush, it incorporates 240 linear inches of brushes, of which 164" are configured in 4 distinct angles. The Spring Tine Rake is housed within the framework of the unit, and consists of 3 rows of 14 tines providing 7/8" spacing with a 40 degree tip bend. The Spring Tine Rake is fully retractable with the working depth being adjustable with a hand lever. The overall weight of the 926 Integrated Turf Groomer is 374lbs, and is measured at 0.35lbs/PSI.
    - b. Synthetic Grass Debris Sweeper:
      - 1) One (1) new and unused GreensGroomer LitterKat® 760 Synthetic Turf Sweeper or approved equal. Sweeper shall be a towable, non-motorized unit. The all steel construction has a frame width of 91" including the wheels. Two 33" long by 10" diameter continuous nylon bristle brushes are powered by a ground driven, direct drive gear with rigid gear guards. A 12V actuator raises and lowers the unit for use or transport. Two perforated collection baskets are 31" long x 35.5" wide x 9" diameter each. Each basket has a 12V vibrator to re-distribute infill. The removable draw bar is 56" long x 3" diameter steel. The LitterKat Synthetic Turf Sweeper weighs 447lbs.
    - c. Synthetic Grass Magnet:
      - 1) One (1) new and unused GreensGroomer Sportsfield Magnet® SFM or approved equal. Synthetic grass magnet shall be a towable unit with a 72" draw bar situated on a frame that rides on 2 pneumatic 280/250-4 ribbed 4-ply tires with bearings. Measuring 72" wide x 5" long x 2" in height, the magnet provides 360 sq. inches of surface. Strength of the magnet is 670lbs Pull. The weight of the complete unit is 102lbs.
    - d. Synthetic Grass Hand Equipment:
      - 1) Rakes: The Contractor shall supply at the end of the Project two (2) new and unused plastic leaf hand rakes.
      - 2) Hand Brushes: The Contractor shall supply at the end of the Project two (2) new and unused push brooms.
      - 3) Hand Shovel: The Contractor shall supply at the end of the Project two (2) new and unused 27-inch aluminum scoop shovel with fiberglass handle.

- 4) **Two (2) Gallon Bucket: The Contractor shall supply at the end of the Project two (2) new and unused five (5) gallon bucket with handle and lid.**

- 5) Six (6) Single-Prong Infill Depth Gauges: The contractor shall supply at the end of the Project six (6) new and unused single-prong depth gauge supplied by The Synthetic Turf Council [www.syntheticurfCouncil.org](http://www.syntheticurfCouncil.org), contact: Melanie Taylor, [melanie@syntheticurfCouncil.org](mailto:melanie@syntheticurfCouncil.org)
- e. Maintenance and Grooming Vehicle:
  - 1) John Deere TX (Model Year 2018 or newer) equipped with the following:
    - a) Turf tires acceptable for use on synthetic turf. Off-road or aggressive tires shall not be acceptable.
    - b) Adjustable seat
    - c) Deluxe Cargo Box with reflectors and spray-on liner
    - d) Cargo box power lift
    - e) Backup alarm kit
    - f) Horn kit
    - g) Drawbar, 1.25 in. (38 mm)

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Verify site conditions before proceeding with demolition work. Field check the accuracy of the Drawings and inspect structures, utilities, and other site features prior to start of work and notify Engineer in writing, of any hazardous conditions and/or discrepancies.
- B. Weather Permitted Conditions: The Contractor shall not perform any work if the conditions for working are:
  1. Ambient air temperatures are below 45 degrees F.
  2. Material temperature falls below 45 degrees F.
  3. Rain is forecast or falling
  4. Conditions exist or are pending that will be unsuitable to the installation of the system.
- C. Drawings / Specifications: The Contractor shall perform all work in strict accordance to the Contract Drawings / Plans, Shop Drawings and manufacturer's specifications and instructions.
- D. Verification: The Contractor shall be responsible for the inspecting, verifying and completing all installed work of this section.

#### 3.2 EXAMINATION

- A. **Installer is responsible to review the planarity, pitch (slope) and conditions of the prepared stone base by means of string lines and other methods as they deem necessary.**
- B. Acceptance of Prior Work-Field Base Stone: Upon completion of the base and drainage work, the Site General Contractor shall submit a letter, addressed to the Owner, signed by the Site General Contractor, Resilient pad Installer, and the Synthetic Grass Surfacing Installer. The letter shall confirm Field Base Stone has been reviewed, including all testing data, and is acceptable for

installation of the synthetic grass surfacing system. Any discrepancies, problems, and/or conflicts shall be addressed prior to issuance of the letter.

1. Continuing with the installation of the Resilient pad over the field base stone without issuance of such letter shall be considered as an approval of the base by the Resilient pad and Synthetic Grass Surfacing Installer.

### 3.3 PREPARATION

- A. The Contractor shall take special care to protect all field structures and utilities. Any damage shall be repair or replaced at the cost of the Contractor
- B. Layout: The Contractor shall be responsible for furnishing, setting and marking all lines, seams and markings for the field. The Contractor shall at all times maintain all necessary benchmarks and control points to locate all events and markings.
- C. Slope: The field shall be installed with a minimum 0.5% and maximum 0.75% slope unless otherwise noted in the Drawings, from the center crown to the sideline.
  1. The finish profile of the crown of the field may not exceed grade shown on the Drawings. This will be maintained throughout the length of the crown.
  2. Contractor shall excavate at trench drain/anchor curb at field perimeter so top of resilient pad can be installed flush with top of concrete notch at trench drains. See Detail.
  3. All field base stone shall be touched up and laser graded prior to testing and installation of new turf.

### 3.4 INSTALLATION

- A. Resilient pad
  1. Prior to pad installation pad installer /manufacturer shall provide written acceptance of the prepared subgrade material and surface. Acceptance shall, at a minimum, include the following:
    - a. Permeability
    - b. Planarity
    - c. Suitability for synthetic turf system.
  2. Install Pad loose laid on gravel base in accordance with manufacturer's requirements.
  3. Protect panels from damage or movement during the installation process. Damaged panels shall be rejected. Install panels and cover with turf promptly. Do not leave panels exposed overnight without ballasting. Contractor is responsible for material stability during construction and shall take all measures necessary to avoid shifting or displacement due to construction, weather or temperature changes.
  4. An interlocking panel design shall be used to hold adjacent panels in place.

5. Pads shall be cut and fit tightly to the edges of the field and all objects within the field. No gaps in the pad over ¼" are acceptable. Use largest size possible. Filler strips or piecemeal work are not acceptable.
6. Grade and planarity of installed Pad system shall comply Surface Regularity of this specification. Care shall be taken to fix any disturbances of the stone base while installing the resilient pad.

B. Synthetic Grass Surfacing Installation

1. The synthetic grass carpet shall be staged and unrolled as necessary for a daily installation. No material will be allowed to be unrolled 24 hours prior to installation.
2. Synthetic grass surfacing shall be installed over the resilient pad. Care shall be taken so as not to damage installed resilient pad.

C. Seams

1. All panel seams spacing is to be held to a minimum of 15 feet unless prior approval of seaming diagram indicates a lesser panel.
2. Fabric surface shall be constructed and installed in minimum widths of 15 feet with no longitudinal or transverse seams, except for inlaid lines with a finished roll assembly. The seams shall be 15'-0" apart. No fitted pieces shall be allowed to true alignment.
3. All panel seams shall be securely ~~sewn or~~ glued and lay flat. Minimum of 5" of seaming tape and glue shall be on either side of the seam.
  - a. Ridges or tenting of seams is not acceptable.
  - b. Gaps greater than 1/8" are not acceptable.
- ~~4. All synthetic grass surfacing seams shall be sewn with high strength polyester fiber cord. Sewn seams shall be a butt sewn with double loop lock stitch. Seams shall lay flat after in fill. Bagger type seam stitching is not permitted~~
5. All seams shall be brushed thoroughly before infill materials are installed.
6. All seams shall have full fastenings and no loose areas. At no time can pulling on the section separate the material.
7. The Synthetic Grass System shall remain free draining at all times before, during, and after the infill materials are installed.

D. Synthetic Grass System Edges and Termination

1. **All edges and ends of the synthetic grass system shall be secured to the anchor curb by 100% glue.**
  - a. **Hot melt or nailing is not acceptable.**
  - b. **Final infill level shall be flush with adjacent anchor curb or track surfacing unless noted otherwise on plan.**

E. Lines, Markings, Logos, and In-Lays

1. Lines and markings shall be tufted in the factory to the greatest extent possible during manufacturing.
2. All lines, numbers, and field markings are to be tufted or in-laid, shaving shall not be permitted, with the specific colored synthetic grass. All lines and markings shall be accurately set and surveyed to within 1/2" tolerance.
3. All lines and markings shall be installed and verified prior to any installation of in-fill material.
4. All glued inlays shall have a 12" wide seaming tape, fully coated with adhesive. All inlays shall not have any adhesive applied to any exposed fibers. All graphics or markings can be tuft-in or cut-in (shaving is not permitted).
5. All seams and in-laid areas shall be brushed thoroughly before infill materials are installed.
6. All seams and inlays shall have full fastenings and no loose areas. At no time can pulling on the section separate the material.
7. Installer shall exercise caution to prevent gluing or adhesion of turf to resilient pad. Glue shall not be applied directly to pad in any instance.

F. Synthetic Grass Surfacing Infill

1. No in-fill materials shall be installed until the synthetic grass surfacing is fully installed with all lines and markings.
2. The synthetic grass surfacing shall be thoroughly brushed prior to any in-fill materials to remove any wrinkles and defibrillate the slit film.
3. Infill shall not leave more than 1/2" of exposed fiber on sports fields.
4. The in-fill materials shall be installed in layers not to exceed 0.30 lbs per sq ft per layer.
5. Infill material shall be 'worked into' the thatch/rootzone/spikezone layer. Contractor shall allow time and proper machinery to do so.

3.5 PROTECTION

- A. The Contractor shall take special care to protect all field and building structures and utilities. Any damage shall be repair or replaced at the cost of the Contractor.

### 3.6 TRAINING INSTRUCTION AND OWNERS MANUALS

- A. Provide a 4 hour, at a minimum, on-site training instructional program for the Owner. Prior to conducting training the contractor shall put together and test all maintenance equipment. Equipment shall be fully functional and ready to use at the time of the training. The training shall include review and demonstration generally of the following, but not be limited to:
  - 1. Daily/Weekly fiber, infill, and seam inspections.
  - 2. Low infill hand grooming and infill placement.
  - 3. Seam repair.
  - 4. Field sweeping, grooming, and decompaction (with tines groomer if applicable). Including demonstration of hock-up, detachment, and use of all equipment with the Owner's equipment.
  - 5. Field plowing (if applicable).
  - 6. Protection for events.
  - 7. Procedure for Warranty claims.
- B. The training instruction will be summarized on a DVD included in the Owner's Manual and close-out documents.
- C. Training shall take place no later than fourteen (14) days after article "Quality Control Testing, Post-Construction Testing" is completed.

### 3.7 AS-BUILT FIELD LAYOUT DRAWING

- A. Provide As-Built Field Layout Drawing including verification of field layout dimensions, by licensed surveyor, to the Landscape Architect for review and approval.
  - 1. Provide as-built survey in AutoCAD and .pdf format for review.

### 3.8 CLEAN UP

- A. The site shall be kept clean and free of debris throughout the installation. Empty barrels, sacks, bags, and remnant materials shall be stored or disposed daily in a proper container or legal manner.
- B. After completion of the entire Project, the site shall have a general cleanup removing all debris remaining on the site that is not a part of the final Project.
- C. The equipment supply requirements for this Project shall be part of the total price and shall be the sole expense of the Contractor.
- D. All natural grass areas disturbed during this construction shall be restored to the satisfaction of the Owner at no additional cost to the Owner.
- E. All attic stock materials shall be placed in it's appropriate location as determined by the Owner.

3.9 Acceptance

- A. Should any imperfections develop in the surface areas prior to the final acceptance of the work, they shall be removed and replaced with new materials. All such repair work shall be done at no additional cost to the Owner.
- B. Acceptance will be issued to the Contractor as described under “Substantial Completion” when all work under this section is found to be completed. The Owner or Landscape Architect will not be responsible for any additional acceptance requirements by the Contractor or subcontractor.

END OF SECTION 32 18 13

**SECTION 32 31 13 – CHAIN LINK FENCES AND GATES (ADDENDUM #2)**

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes
  - 1. Furnishing and installing woven wire fencing systems of the type and height specified and supported by metal posts erected where indicated on the Drawings and as specified herein, including fence and gates.
- B. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.
- C. Contractor is responsible for all health and safety.

1.2 REFERENCES

- A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.
- B. Code of Federal Regulations (CFR).
  - 1. 29 CFR 1926, Safety and Health Regulations for Construction.
- C. American Society for Testing and Materials (ASTM).
  - 1. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 2. ASTM A90- Standard Test Method for Weight (Mass) of Coating on Iron or Steel Articles with Zinc or Zinc Alloy.
  - 3. ASTM A123- Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
  - 4. ASTM A153- Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
  - 5. ASTM A392- Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
  - 6. ASTM A428- Standard Test Method for Weight (Mass) of Coating on Aluminum-Coated Iron or Steel Articles.
  - 7. ASTM A491- Standard Specification for Aluminum Coated Steel Chain Link Fence Fabric.
  - 8. ASTM A780 – Standard Specification for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
  - 9. ASTM A817- Standard Specification for Metallic-Coated Steel Wire for Chain Link Fence Fabric and Marcellled Tension Wire.

10. ASTM A824 - Standard Specification Metallic-Coated Steel Marcellled Tension Wire for Use with Chain Link Fence.
11. ASTM B211- Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire.
12. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
13. ASTM F552 - Standard Terminology Relating to Chain Link Fencing.
14. ASTM F567- Standard Practice for Installation of Chain Link Fence.
15. ASTM F626 - Standard Specification for Fence Fittings.
16. ASTM F668 - Specification for Polymer Coated Chain Link Fence Fabric.
17. ASTM F900 - Standard Specification for Industrial and Commercial Swing Gates.
18. ASTM F934 - Specification for Standard Colors for Polymer-Coated Chain Link.
19. ASTM F1043 - Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
20. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
21. ASTM F1183 - Standard Specification for Aluminum Alloy Chain Link Fence Fabric.

D. Chain Link Fence Manufacturer's Institute

1. Chain Link Fence Manufacturer's Institute Product Manual, latest revision.

1.3 SYSTEM DESCRIPTION

A. Temporary Construction Fence shall meet the following basic parameters:

1. Fence Height: 8 feet.
2. Mesh Size: 2 inches.
3. Mesh Gage: 12
4. Gates: Height of gates shall match that of fence. Width of gates shall be as shown on the Drawings.
5. Anchored post or driven posts where indicated. No top or bottom rails required.
6. Panelized/modular units where indicated. Two stabilizers per panel.

B. Permanent Fence shall meet the following basic parameters:

1. Fence Height: Varies, refer to the Drawings.
2. Type:
  - a. At Running Track: 9 gauge vinyl coated black mesh and accessories

- b. Alternate Perimeter fence: 9 gauge galvanized mesh and accessories
3. Mesh Size:
  - a. Field and boundary fencing: 2"
  - b. All mesh to have knuckled both selvages.
4. Mesh Gage:
  - a. Field Fencing: Wire with a diameter of 9 gauge galvanized core fused. Measured prior to application of coating.
  - b. Perimeter Fencing (alternate): Wire with a diameter of 9 gauge galvanized core fused. Measured prior to application of coating.
5. Gates: Height of gates shall match that of fence. Type and size of gates shall be as shown on the Drawings.
6. Anchored post where indicated; top and bottom rails between posts unless otherwise indicated.

#### 1.4 SUBMITTALS

- A. Shop drawings showing the plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates and a schedule of components.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
  1. Fence and gate posts, rails, and fittings.
  2. Chain-link fabric, reinforcements, and attachments.
  3. Accessories: Privacy slats.
  4. Gates, locking mechanisms and hardware.
- C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show accessories, hardware, gate operation, and operational clearances.
- D. Samples for Initial Selection: For components with factory-applied color finishes.
- E. Samples for Verification: Prepared on Samples of size indicated below:
  1. Polymer-Coated Components: In 6-inch lengths for components and on full-sized units for accessories.
- F. Delegated-Design Submittal: For chain-link fences and gate framework indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified factory-authorized service representative.
- B. Product Certificates: For each type of chain-link fence, and gate, from manufacturer.
- C. Product Test Reports: For framing strength according to ASTM F 1043.
- D. Field quality-control reports.
- E. Warranty: Sample of special warranty.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For the following to include in emergency, operation, and maintenance manuals:
  - 1. Polymer finishes.
  - 2. Gate hardware.

#### 1.7 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Supply material in accordance with Chain Link Fence Manufacturer's Institute Product Manual and this Specification.
- C. Perform installation in accordance with ASTM F567.
- D. Maintain all facilities installed under this Section in proper and safe condition throughout the progress of the work.
- E. Testing Agency Qualifications: For testing fence grounding. Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Emergency Access Requirements: Comply with requirements of authorities having jurisdiction for gates with automatic gate operators serving as a required means of access.
- H. Mockups: Build mockups to set quality standards for fabrication and installation.
  - 1. Include 10-foot length of fence and gate.
- I. Preinstallation Conference: Conduct conference at Project site.
  - 1. Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.

2. Review sequence of operation for each type of gate operator.
3. Review coordination of interlocked equipment specified in this Section and elsewhere.
4. Review required testing, inspecting, and certifying procedures.

#### 1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

#### 1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.
- B. Packages shall be labeled with the manufacturer's name.
- C. Store fence fabric and accessories in a secure and dry place.

#### 1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Faulty operation of gate accessories and mechanisms.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- B. Warranty Period: Five years from date of Substantial Completion.

### PART 2 PRODUCTS

#### 2.1 GENERAL

- A. Material furnished shall be in good condition and shall not have been painted.
- B. All posts and rails shall be straight, true to section and of sufficient length for proper installation.
- C. Unless otherwise specified, hardware and accessories shall conform to the requirements of ASTM F626 and ASTM A123 or ASTM A153 as applicable for zinc-coating.

## 2.2 LINE POSTS

- A. See Drawings for size and type depending on height of fence.
  - 1. Vinyl Coated Color: Black Class 2b fused and adhered
  - 2. Galvanized class 2 – Zinc coating 2oz/ft<sup>2</sup>

## 2.3 CORNER, END, AND PULL POSTS

- A. See Drawings for size depending on height of fence.
  - 1. Vinyl Coated Color: Black Class 2b fused and adhered
  - 2. Galvanized class 2 – Zinc coating 2oz/ft<sup>2</sup>

## 2.4 BRACE ASSEMBLY

- A. Rails
  - 1. 1.25-inch nominal (1.660 O.D.) steel pipe, steel pipe.
    - a. Vinyl Coated Color: Black Class 2b fused and adhered
    - b. Galvanized class 2 – Zinc coating 2oz/ft<sup>2</sup>
- B. Truss rod shall be 3/8-inch with adjustable turnbuckles or truss tightener to match fabric type.

## 2.5 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:
  - 1. Fabric Height: As indicated on Drawings.
  - 2. Steel Wire Fabric:
    - a. Field Fencing: Wire with a diameter of 9 gauge galvanized core fused. Measured prior to application of coating.
    - b. Mesh Size:
      - 1) 2 inches. Measured prior to application of coating.
    - c. Polymer-Coated Fabric: ASTM F 668, Class 2b.
      - 1) Color: Black, ASTM F 934.
    - d. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.
    - e. Galvanized Fabric: ASTM F 392, Zinc coating 2oz/ft<sup>2</sup>.
      - 1) Color: natural grey.

f. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.

3. Selvage: Knuckled at both selvages.

## 2.6 FENCE FRAMING

A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:

1. Fence Height: As indicated on Drawings.

2. Light Industrial Strength: Material Group IC-L, round steel pipe, electric-resistance-welded pipe.

a. Line Post: Refer to Drawings for post sizes based on fence height.

b. End, Corner and Pull Post: Refer to Drawings for post sizes based on fence height.

3. Horizontal Framework Members: Intermediate top and bottom rails complying with ASTM F 1043.

a. Top, Bottom and Mid Rail for all fencing systems and all heights: Refer to Drawings for post sizes based on fence height.

b. Brace Rails: Comply with ASTM F 1043.

B. Polymer coating over metallic coating.

1. Color: Black, ASTM F 934.

## 2.7 STRETCHER BARS

A. Bars shall be one piece lengths of zinc-coated steel, not less than 2-inches shorter than the full height of the fencing fabric with a minimum cross section of 3/16-inch by 3/4-inch, ASTM F626.

B. Polymer coating over metallic coating.

C. Color: Black, ASTM F 934.

## 2.8 TENSION WIRE

A. Polymer-Coated Steel Wire: Marcellled (spiraled or crimped) No. 7 gage, (0.177-inches) diameter, ASTM A824, ASTM F 1664,

B. Polymer coating Class 2b over-coated steel wire. Color Black, ASTM F 934.

C. Galvanized Type II zinc coated class 5 - 2oz/ft<sup>2</sup>

## 2.9 HARDWARE AND TIES

A. Hardware & tie finish shall match that of fence fabric used.

- B. Miscellaneous hardware, including but not limited to nuts, bolts, washers, clips, bands, rail ends, brackets, and straps shall be provided as required, hot-dip galvanized steel or aluminum alloy, ASTM F626.
- C. Tension bands shall be formed from flat or beveled steel and shall have a minimum thickness after galvanizing of 0.078-inches and a minimum width of 3/4-inch.
- D. Brace bands shall be formed from flat or beveled steel and shall have a minimum thickness after galvanizing of 0.108-inches and a minimum width of 3/4-inch.
- E. Wire ties shall be minimum 16-gage galvanized steel wire or minimum 9-gage aluminum alloy wire.
- F. All fasteners shall be hot-dip galvanized, ASTM F2329.
- G. Bolts: Steel, ASTM A307.
- H. Washers: Steel, round, ASTM F844.
- I. Bolts: Steel, ASTM A563 Grade A, hex head.

## 2.10 FITTINGS

- A. General: Comply with ASTM F 626.
- B. Post Caps: Provide for each post.
  - 1. Provide line post caps with loop to receive tension wire or top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
  - 1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.
  - 2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails in the fence line-to-line posts.
- E. Tension and Brace Bands: Pressed steel.
- F. Tension Bars: Steel, length not less than 2 inches (50 mm) shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.
- H. Tie Wires, Clips, and Fasteners: ASTM F 626.
  - 1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
    - a. Hot-Dip Galvanized Steel: 0.148-inch- (3.76-mm-) diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.

I. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. (366 g /sq. m) zinc.
  - a. Polymer coating over metallic coating.

2.11 GATES

- A. Gate Construction: ASTM F900. Corners welded or assembled with special malleable or pressed-steel fittings and rivets or bolts to provide rigid connections.
- B. Pipe and Tubing:
  1. Zinc-Coated Steel: Comply with ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framing.
- C. Posts: Round tubular steel.
  1. Size: Refer to Drawings for prost sizes based on fence height.
- D. Gate Frames and Bracing: Round tubular steel.
  1. Framing:
    - a. Size: Refer to Drawings for prost sizes based on fence height.
    - b. Assemble gate frames by welded connections. When width of gate leaf exceeds 10 feet, install mid-distance vertical tubing of the same size and weight as frame members. When either horizontal or vertical bracing is not required, provide truss rods as cross bracing to prevent sag or twist.
    - c. Horizontal bid bracing shall be used on all gates.
- E. Wire Fencing Fabric: Fabric shall match that of fence, attached securely to frame at intervals not exceeding 15-inches.
- F. Hardware:
  1. Hinges: 180-degree outward swing only.
    - a. Hinge brackets shall be tak welded after install and coated.
    - b. Gates shall not allow swing over track surfacing or turf.
    - c. Open gate position shall lie parallel to adjacent fenceline
  2. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
  3. All gates shall be equipped with hot-dipped galvanized steel hinges and latch with provisions for padlocking.
  4. Double gates and single gates with leaf width 4 feet and greater shall be equipped with a minimum ½” drop bar and gate hold backs, one each leaf.

5. Hinges shall be cast steel hinges capable of 180 degree opening. Tak weld hinge brackets to the steel post after installation to lock each hinge to the gate post and prevent rotation. No-lift-off type. Box type hinges are not acceptable.
6. Gate Leaves: Configured with intermediate members and diagonal truss rods or tubular members as necessary to provide rigid construction, free from sag or twist.
7. Latches, hinges, stops, keepers and other hardware items shall be furnished as required for proper operation.

## 2.12 CONCRETE

- A. Concrete shall conform to ASTM C94; or pre-packaged concrete mix, ASTM C387. Minimum 28-day compressive strength of 3,000 psi. No air entrainment.

## 2.13 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Install fence with properly trained crew as shown on the drawings in accordance with ASTM F567.
- B. Install all nuts for tension bands and hardware bolts on the side of the fence opposite the fabric.
- C. The temporary chain link fence shall be removed at the conclusion of the work.

### 3.2 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
  1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

### 3.4 INSTALLATION, GENERAL

A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.

1. Install fencing on established boundary lines inside property line.

### 3.5 CHAIN-LINK FENCE INSTALLATION

A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Concrete post footings shall have a plan diameter 12-inches greater than the post diameter. Holes shall be clean and free of loose soil and debris. Concrete shall be placed continuously in one operation and tamped or vibrated for consolidation. Tops of the concrete footings shall be crowned to shed water.

3. Gate post/footings shall be installed a minimum of 42-inches below grade.

4. All corner, end posts, and gate posts shall be braced.

- a. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.

- b. Corner and terminal posts are to be braced horizontally and diagonally. The braces are to extend over one adjacent panel. Changes in line of 30 degrees or more shall be considered as corners.

- c. Braces and truss rods shall be securely fastened to posts with appropriate hardware.

- d. Pull posts with two braces shall be provided for all heights where changes in horizontal or vertical alignment of ten (10) degrees or more occur.

5. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

- a. Concealed Concrete: Top 3 inches below grade as indicated on Drawings to allow covering with surface material.

- b. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.

- c. Posts Set into Voids in Concrete: Form or core drill holes not less than 5 inches deep and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink,

nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.

- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- D. Line Posts: Space line posts uniformly as indicated on the Drawings. Unless indicated otherwise, spacing shall be 8 feet on-center.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
  - 1. horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- F. Tension Wire: Install according to ASTM F567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches on-center. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:
  - 1. Extended along top and bottom of fence fabric. Install top tension wire through post cap loops. Install bottom tension wire within 6 inches (152 mm) of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- G. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- H. Intermediate and Bottom Rails: Install and secure to posts with fittings.
- I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1 inch between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches on-center.
- K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F626. Bend ends of wire to minimize hazard to individuals and clothing.
  - 1. Maximum Spacing: Tie fabric to line posts at 12 inches on-center and to braces at 24 inches on-center.

- L. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.
- M. Fabric:
  - 1. Do not install fabric until concrete post footings have cured seven (7) days. Provide fabric of the height specified. Install fabric on the public side of the fence, with bottom no greater than 2-inches above the ground surface. Fabric shall be pulled taut to prevent sagging and provide a uniform smooth appearance. Fasten fabric to line posts at intervals not exceeding 15-inches with ties as specified.
  - 2. Install tension wire in one continuous length between pull posts, weaved through fence fabric at top. Tension wire shall be applied to provide a wire without visible sag between posts. Fasten fabric to tension wire at intervals not exceeding 24-inches with ties or hog rings as specified.
  - 3. Where it is not practicable to conform the fence to general contour of the ground, as at ditches, channels, etc., the opening beneath the fence shall be enclosed with chain link fabric and sufficiently braced to preclude access, but not to restrict the flow of water.

### 3.6 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.
- B. Provide swing gates at the locations and dimensions shown on the Drawings. Do not install gates until concrete post footings have cured seven (7) days.
- C. Gates shall be installed plumb, level, and secure, with full opening without interference. Hardware shall be installed and adjusted for smooth operation and lubricated where necessary.
- D. Provide concrete center drop to footing depth and suitable drop rod sleeve at each leaf at center of double gate openings.
- E. Gates shall not be able to swing over adjacent track surfacing. Gates shall open 180 degrees, fully so that gate leaf lies parallel to adjacent fence.

### 3.7 GROUNDING AND BONDING

- A. Fence Grounding: Install at maximum intervals of 1,500 feet except as follows:
- B. Fences within 100 feet of buildings, structures, walkways, and roadways: Ground at maximum intervals of 750 feet.
  - 1. Gates and Other Fence Openings: Ground fence on each side of opening.
  - 2. Bond metal gates to gate posts.
  - 3. Coordinate subparagraph below with Drawings in projects where intentional discontinuities are provided in metal fencing conductivity to localize lightning effects to the vicinity of strikes. See Evaluations.

4. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.
- C. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet on each side of crossing.
- D. Plans and details on Electrical Drawings and requirements in Division 26 Sections may revise or illustrate application of requirement below or may require grounding that exceeds minimum requirements in IEEE C2. Fences enclosing electrical substations are often bonded to a station grounding mat.
- E. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.
- F. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6-inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location, including the following:
  1. Make grounding connections to each barbed wire strand with wire-to-wire connectors designed for this purpose.
  2. Make grounding connections to each barbed tape coil with connectors designed for this purpose.
- G. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
- H. Connections: Make connections to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
  1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
  2. Make connections with clean, bare metal at points of contact.
  3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
  4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
  5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- I. Bonding to Lightning Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor complying with NFPA 780.

### 3.8 FIELD QUALITY CONTROL

- A. Grounding-Resistance Testing: Engage a qualified testing agency to perform tests and inspections.

1. Grounding-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure grounding resistance no fewer than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural grounding resistance. Perform tests by two-point method according to IEEE 81.
2. Excessive Grounding Resistance: If resistance to grounding exceeds specified value, notify Architect promptly. Include recommendations for reducing grounding resistance and a proposal to accomplish recommended work.
3. Report: Prepare test reports certified by a testing agency of grounding resistance at each test location. Include observations of weather and other phenomena that may affect test results.

### 3.9 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

### 3.10 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION

**GENERAL NOTES**

1. THE SUBJECT PROPERTY IS NOT LOCATED WITHIN A FEMA SPECIAL FLOOD HAZARD AREA OR AN AQUIFER PROTECTION ZONE.
2. A PRECONSTRUCTION MEETING WITH TOWN STAFF, THE OWNER, ARCHITECT AND THE ENGINEER IS REQUIRED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY.
3. NO ACCESS TO ADJACENT PROPERTIES IS PERMITTED WITHOUT PRIOR WRITTEN APPROVAL OF THE PROPERTY OWNER(S).
4. CONSTRUCTION TRAFFIC SHALL ACCESS THE SITE OVER THE SPECIFIED ANTI-TRACKING PAD.
5. THE CONTRACTOR SHALL MAINTAIN SIDE SLOPES AND DRAINAGE SWALES DURING CONSTRUCTION TO PREVENT PONDING AND EROSION.
6. THE CONTRACTOR SHALL MAINTAIN EXCAVATION SLOPES DURING CONSTRUCTION IN ACCORDANCE WITH THE MINIMUM AND MAXIMUM SLOPES STIPULATED BY ANY STATE OR FEDERAL AGENCY. ANY LATERAL SUPPORT SYSTEM USED IN THE FIELD SHALL BE INCIDENTAL TO THE APPROPRIATE WORK ITEM AND CONFORM TO OSHA REQUIREMENTS.
7. ALL EARTHWORK SHALL BE PERFORMED IN THE DRY. SHOULD GROUNDWATER BE ENCOUNTERED DURING EXCAVATION, THE CONTRACTOR SHALL DEVELOP A DEWATERING PLAN TO BE REVIEWED AND APPROVED BY THE ENGINEER AND OWNER'S REPRESENTATIVE PRIOR TO IMPLEMENTATION. THE DEWATERING PLAN SHALL INCLUDE MEASURES TO PREVENT SEDIMENT LOADED WATER FROM BEING DISCHARGED TO ANY DRAINAGE SYSTEM, WETLANDS OR WATERCOURSE.
8. THE CONTRACTOR IS RESPONSIBLE FOR: BYPASSING ANY FLOWS COMING DIRECTLY FROM ANY UPSTREAM SOURCES; ALL CONSTRUCTION DEWATERING NECESSARY FOR ACHIEVING A FIRM, DRY SUBGRADE; CONTROLLING ANY STORMWATER FLOWS COMING FROM ON-SITE AND OFF-SITE LOCATIONS; AND ANY OTHER MEASURES NECESSARY TO COMPLETE THE WORK INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MONITORING OVERHEAD UTILITIES AND UNDERGROUND UTILITIES AT THE SITE FOR THE DURATION OF THE PROJECT.
10. ALL PROPOSED UTILITY SERVICES TO THIS PROJECT SHALL BE UNDERGROUND UNLESS OTHERWISE NOTED.
11. ALL MATERIALS, INSTALLATIONS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PROJECT MANUAL AND THE CONNECTICUT DEPARTMENT OF TRANSPORTATION (CTDOT) STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION, FORM 817 AS AMENDED.
12. ALL TRAFFIC SIGNAGE, MARKINGS, LOCATIONS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED.
13. ALL HANDICAP ACCESSIBLE FEATURES SHALL BE IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES AS AMENDED.
14. EROSION CONTROL MEASURES SHALL BE THE FIRST ITEM OF CONSTRUCTION AND SHALL BE MAINTAINED UNTIL ALL ACTIVITY AREAS ARE PERMANENTLY STABILIZED.
15. ALL SITE WORK SHALL CONFORM TO ALL LOCAL AND STATE PERMITS AND APPLICABLE CODE REQUIREMENTS.

**CONSTRUCTION NOTES**

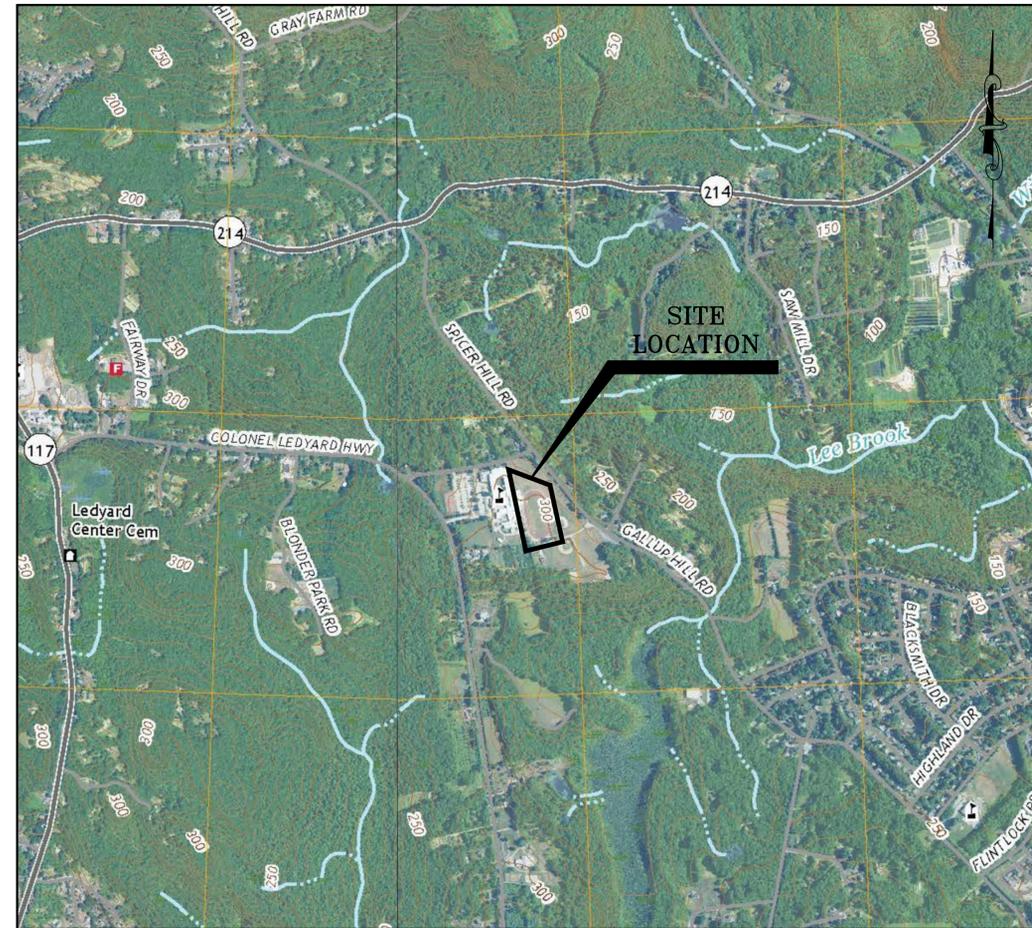
1. THE CONTRACTOR SHALL CALL "CALL BEFORE YOU DIG" (CBYD) AT 1-800-922-4455 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS, EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE CBYD PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.
2. LOCATIONS OF EXISTING PIPES, CONDUITS, UTILITIES, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS ARE NOT WARRANTED TO BE CORRECT AND THE CONTRACTOR SHALL HAVE NO CLAIM ON THAT ACCOUNT SHOULD THEY BE OTHER THAN SHOWN.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT TEST PITS TO CONFIRM EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION.
4. STONE WALLS, FENCES, MAIL BOXES, SIGNS, CURBS, LIGHT POLES, ETC. SHALL BE REMOVED AND REPLACED AS NECESSARY TO PERFORM THE WORK. UNLESS OTHERWISE INDICATED, ALL SUCH WORK SHALL BE INCIDENTAL TO CONSTRUCTION OF THE PROJECT.
5. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS BEYOND PROJECT LIMITS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS AT NO ADDITIONAL COST TO THE OWNER.
6. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND PROJECT LIMITS SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
7. THE CONTRACTOR SHALL NOT STORE ANY APPARATUS, MATERIALS, SUPPLIES, OR EQUIPMENT ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS.
8. OPENINGS FOR PIPE IN PRECAST STRUCTURES SHALL BE CAST IN THE REQUIRED LOCATIONS DURING STRUCTURE MANUFACTURE. FIELD CUT OPENINGS WILL NOT BE PERMITTED UNLESS CORE DRILLED OR APPROVED BY THE ENGINEER.
9. IN PAVED AREAS, THE TOP OF MANHOLE COVERS SHALL BE SET FLUSH WITH THE PAVED SURFACE. IN OTHER AREAS THE TOP OF THE COVERS SHALL BE SET FLUSH TO THE FINISHED GRADE, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
10. INLET PROTECTION SHALL BE PROVIDED AND MAINTAINED ON ALL EXISTING AND PROPOSED DRAINAGE INLETS UNTIL ALL DISTURBED AREAS OF THE PROJECT SITE ARE PERMANENTLY STABILIZED.
11. THE TRUNKS OF TREES WHICH ARE ADJACENT TO THE WORK AND ARE NOT TO BE REMOVED SHALL BE PROTECTED IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL AS AMENDED TO PROTECT THEM FROM INJURY FROM PILED MATERIAL, FROM EQUIPMENT, FROM THE OPERATIONS, OR OTHERWISE DUE TO THE WORK.
12. BRANCHES, LIMBS AND ROOTS OUTSIDE OF THE LIMIT OF CLEARING SHALL NOT BE CUT EXCEPT BY PERMISSION OF THE OWNER OR OWNER'S REPRESENTATIVE. ALL CUTTING SHALL BE SMOOTHLY AND NEATLY DONE WITHOUT SPLITTING OR CRUSHING.
13. ALL PROPOSED PAVING SHALL MATCH EXISTING GRADE AT INTERSECTIONS WITH EXISTING PAVEMENT.
14. ALL EXCAVATIONS WITHIN TRAVEL WAYS SHALL BE COMPLETELY CLOSED BY BACKFILLING OR PLATING AT THE END OF EACH WORKING DAY. THE CONTRACTOR SHALL BARRICADE AND APPROPRIATELY SIGN ALL TRENCHES, HOLES AND OTHER EXCAVATIONS TO PREVENT ACCIDENTAL FALLS AND UNAUTHORIZED ENTRY DURING CONSTRUCTION.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATE BARRICADES, FENCING, SIGNAGE AND SITE SECURITY DURING AND AFTER WORK HOURS. THE CONTRACTOR SHALL PROVIDE AND INSTALL ADDITIONAL SECURITY AND SAFETY MEASURES TO ENSURE THE PROTECTION OF PUBLIC SAFETY AND SECURITY IS MAINTAINED AT ALL TIMES THROUGHOUT THE ENTIRE DURATION OF THE PROJECT.
16. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH ALL NECESSARY TRAFFIC CONTROL DEVICES AND PERSONNEL REQUIRED TO MAINTAIN SAFE PUBLIC AND EMERGENCY ACCESS WHERE APPROPRIATE DURING ALL PHASES OF THE PROJECT, INCLUDING BUT NOT LIMITED TO TEMPORARY BARRIERS AND TEMPORARY FENCING.
17. EROSION CONTROL BLANKETS SHALL BE INSTALLED ON ALL SLOPES 3H:1V AND STEEPER.
18. STAKEOUT OF ALL PROPOSED IMPROVEMENTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

**UTILITY NOTES**

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES DEPICTED ON THESE DRAWINGS ARE FROM THE BEST AVAILABLE SOURCES. SUCH INFORMATION IS FURNISHED ONLY FOR THE INFORMATION OF THE CONTRACTOR AND IS NOT GUARANTEED.
2. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE APPLICABLE UTILITY.
3. AT ALL UTILITY CROSSINGS, A MINIMUM 18" VERTICAL SEPARATING DISTANCE SHALL BE PROVIDED UNLESS INDICATED OTHERWISE ON THE PLANS. IF THE INDICATED SEPARATION CANNOT BE ACHIEVED, THE OWNER SHALL BE NOTIFIED PRIOR TO PROCEEDING. CONCRETE ENCASUREMENT SHALL BE UTILIZED AS REQUIRED.
4. ALL VALVE BOXES AND CURB BOXES SHALL BE ADJUSTED TO THE FINAL GRADES. ALL CURB BOXES SHALL BE LOCATED IN GRASSED AREAS UNLESS INDICATED OTHERWISE ON THE PLANS.
5. RECORD DRAWINGS OF ALL UTILITIES SHALL BE MAINTAINED FOR THE DURATION OF CONSTRUCTION AND SUBMITTED TO THE APPROPRIATE UTILITY UPON COMPLETION OF THE WORK OR AT SUCH STAGES OF THE CONSTRUCTION AS REQUIRED. DRAWINGS SHALL BE IN A FORM ACCEPTABLE TO THE UTILITY PROVIDERS AND SHALL BE APPROVED PRIOR TO FINAL ACCEPTANCE OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL INFORMATION NECESSARY TO GENERATE DRAWINGS AND WILL PROVIDE THE ACTUAL DRAWINGS. A REDLINED PROGRESS SET OF DRAWINGS SHALL BE MAINTAINED DAILY AND BE AVAILABLE ON SITE AT ALL TIMES.
6. UTILITY LOCATIONS MAY VARY. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER, THE OWNER'S REPRESENTATIVE AND THE CUSTODIAL UTILITY COMPANY PRIOR TO CONSTRUCTION. FINAL LOCATIONS OF ALL UTILITIES SHALL BE DETERMINED BY THE CUSTODIAL UTILITY COMPANY.
7. THE LOCATIONS OF PROPOSED UTILITIES WERE ESTABLISHED USING AVAILABLE EXISTING AND PROPOSED SITE INFORMATION. THE CONTRACTOR MAY ADJUST THE LOCATIONS TO MATCH FIELD CONDITIONS AND CUSTODIAL UTILITY COMPANY REQUIREMENTS. THE CONTRACTOR SHALL INFORM THE OWNER AND THE OWNER'S REPRESENTATIVE REGARDING DEVIATIONS FROM THE PLANS PRIOR TO MAKING ANY FIELD MODIFICATIONS.
8. ALL DRAINAGE PIPE SHALL BE SMOOTH INTERIOR HIGH DENSITY POLYETHYLENE PIPE (HDPE) OR APPROVED EQUAL UNLESS OTHERWISE NOTED. ALL PIPE SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. A MINIMUM TWO-FOOT OF COVER SHALL BE PROVIDED PRIOR TO ANY VEHICULAR TRAFFIC.
9. ALL STORM DRAINAGE STRUCTURES INCLUDING CATCH BASINS, MANHOLES AND RISERS SHALL BE PRECAST REINFORCED CONCRETE CONFORMING TO THE CTDOT STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION. ALL CATCH BASIN AND MANHOLE FRAMES AND COVERS SHALL BE CAST IRON AASHTO TRAFFIC LOAD RATED AND SHALL BE PRIME AND PAINTED. ALL GRATES WITHIN WALKING AREAS SHALL BE ADA COMPLIANT.

**LEGEND & ABBREVIATIONS**

±	MORE OR LESS	TC	TOP OF CURB
AC.	ACRES	BC	BOTTOM OF CURB
CY	CUBIC YARDS	BS	BOTTOM OF STEP
TYP	TYPICAL	TS	TOP OF STEP
CONC	CONCRETE	ME	MATCH EXISTING
PVC	POLYVINYL CHLORIDE	TF	TOP OF FRAME
RCP	REINFORCED CONCRETE PIPE	BW	GRADE AT BOTTOM OF WALL
HDPE	HIGH DENSITY POLYETHYLENE PIPE	TW	GRADE AT TOP OF WALL
VCP	VITRIFIED CLAY PIPE	EW	GRADE AT END OF WALL
DI	DUCTILE IRON	x 560.0	EXISTING SPOT ELEVATION
FEU	FLARED END UNIT	x 560.0	PROPOSED SPOT ELEVATION
S.F.	SQUARE FEET	— 560 —	EXISTING CONTOUR
FF	FINISHED FLOOR	— 560 —	PROPOSED CONTOUR
BSMT	BASEMENT	—	EXISTING TREELINE
ELEV	ELEVATION	—	PROPOSED TREELINE
S	SLOPE	— S —	SANITARY SEWER
Ø	DIAMETER	— W —	WATER
LF	LINEAR FEET	— G —	GAS
SMH	SANITARY MANHOLE	— E/T/C —	ELECTRIC/TELEPHONE/COMMUNICATION
ESMH	EXISTING SANITARY MANHOLE	— SE —	SECONDARY ELECTRIC
PSMH	PROPOSED SANITARY MANHOLE	—	OVERHEAD WIRE
DMH	DRAINAGE MANHOLE	— FD —	FOOTING DRAIN
EDMH	EXISTING DRAINAGE MANHOLE	— FP —	FIRE PROTECTION
PDHM	PROPOSED DRAINAGE MANHOLE	— RD —	ROOF DRAIN
CB	CATCH BASIN	•	ANGLE POINT
ECB	EXISTING CATCH BASIN	○	IRON PIPE, IRON PIN, OR REBAR
PCB	PROPOSED CATCH BASIN	□	MONUMENT
TF	TOP OF FRAME	●	POINT TO BE SET
INV	INVERT	○	UTILITY POLE
FL	FLOW LINE	○	UTILITY POLE WITH LIGHT
CO	CLEAN OUT	○	GUY WIRE
TP	DEEP TEST PIT	○	CATCH BASIN
GV	GAS VALVE	○	SANITARY MANHOLE
WV	WATER VALVE	○	STORM DRAINAGE MANHOLE
HH	HAND HOLE	○	WATER OR GAS VALVE
MB	MAILBOX	○	BLOW OFF VALVE
W/	WITH	○	DEEP TEST PIT
WF	WETLAND FLAG	○	BENCH MARK
CHD	CONNECTICUT HIGHWAY DEPARTMENT	○	SIGN
MON	MONUMENT	○	WETLAND FLAG
REC	RECOVERED	○	LIGHT POLE
CL&P	CONNECTICUT LIGHT AND POWER	○	Boulder
N/F	NOW OR FORMERLY		
BCLC	BITUMINOUS CONCRETE LIP CURB		



**LOCATION MAP**

SCALE: 1"=1000'

"APPROVED BY THE TOWN OF LEDYARD PLANNING & ZONING COMMISSION"

"TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

CHAIRMAN OR SECRETARY OF THE COMMISSION DATE

DAVID C. MCKAY, P.E. LICENSE NO. DATE

JOHN U. FAULISE JR., L.S. LICENSE NO. DATE

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Phone: 860-229-0361 Fax: 860-229-5303

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**BOUNDARIES**

Boundaries LLC  
179 Pachaug River Drive, Griswold, CT 06351  
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9/30/2019	ADDENDA
10/2/2019	ADDENDA 2

REVISIONS	
DATE	REFERENCE



**LEDYARD HIGH SCHOOL  
TRACK & FIELD  
RENOVATIONS**

24 GALLUP HILL RD.  
LEDYARD, CT 06339

PROJECT NO.: 19-2752 DRAWN BY: DM

**GENERAL NOTES,  
DRAWING INDEX  
AND LOCATION  
MAP**

DRAWING NO.:

**C1.01**

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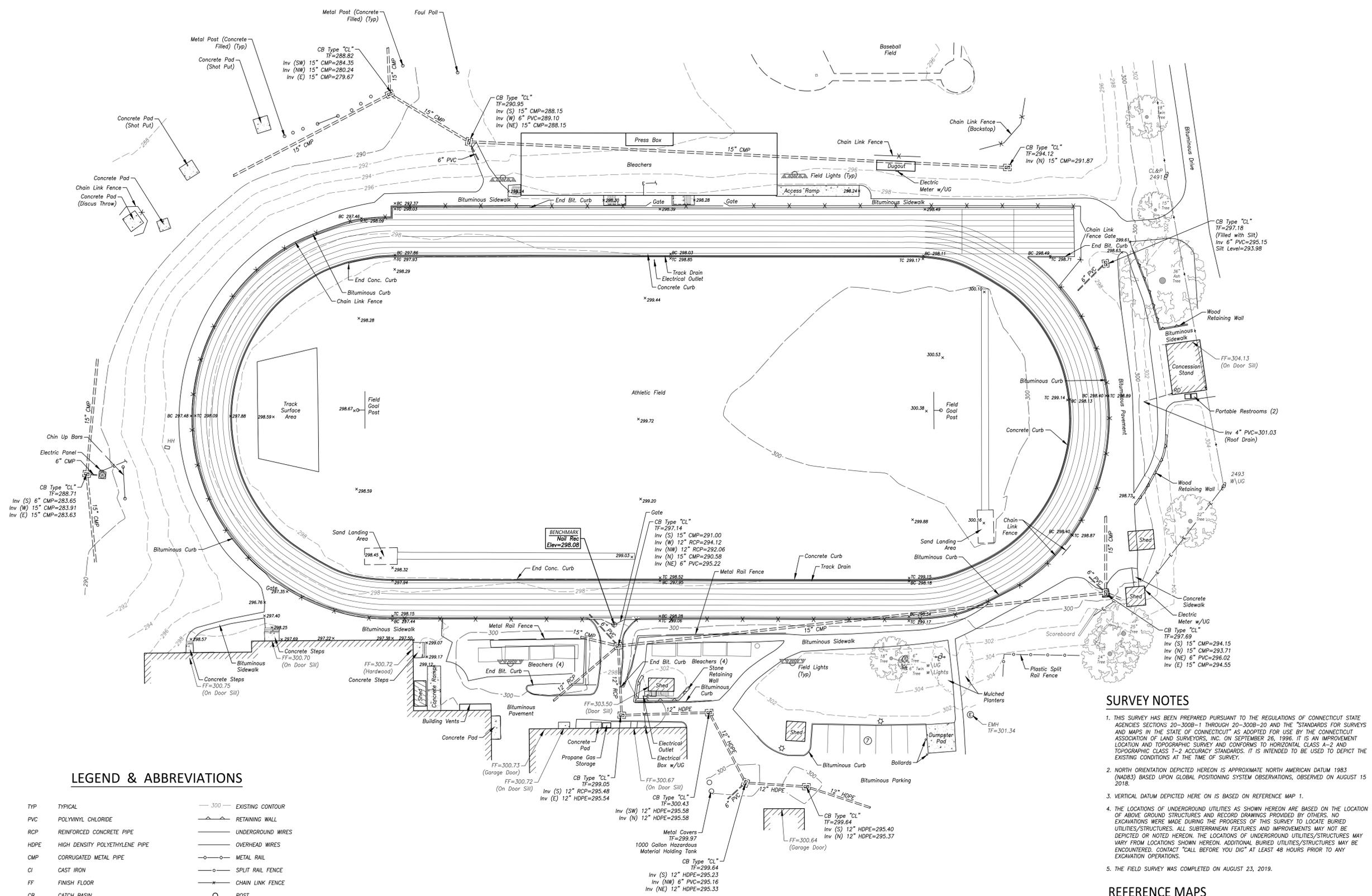
**LEDYARD HIGH SCHOOL TRACK & FIELD RENOVATIONS**

**24 GALLUP HILL RD.  
LEDYARD, CT 06339**

PROJECT NO.: 19-2752 DRAWN BY: **DM**

**EXISTING CONDITIONS PLAN**

DRAWING NO.: **C2.01**



**LEGEND & ABBREVIATIONS**

TYP	TYPICAL	— 300 —	EXISTING CONTOUR
PVC	POLYVINYL CHLORIDE	—	RETAINING WALL
RCP	REINFORCED CONCRETE PIPE	—	UNDERGROUND WIRES
HDPE	HIGH DENSITY POLYETHYLENE PIPE	—	OVERHEAD WIRES
CMP	CORRUGATED METAL PIPE	—	METAL RAIL
CI	CAST IRON	—	SPLIT RAIL FENCE
FF	FINISH FLOOR	—	CHAIN LINK FENCE
CB	CATCH BASIN	○	POST
EMH	ELECTRIC MANHOLE	⊙	UTILITY POLE
TF	TOP OF FRAME	—	GUY WIRE
INV	INVERT	⊙	CATCH BASIN
HH	HANDHOLE	⊙	ELECTRIC MANHOLE
UG	UNDERGROUND	⊙	LIGHT STANDARD
W/	WITH	⊙	WELL
CL&P	CONNECTICUT LIGHT AND POWER		

**SURVEY NOTES**

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300B-1 THROUGH 20-300B-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED FOR USE BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS AN IMPROVEMENT LOCATION AND TOPOGRAPHIC SURVEY AND CONFORMS TO HORIZONTAL CLASS A-2 AND TOPOGRAPHIC CLASS T-2 ACCURACY STANDARDS. IT IS INTENDED TO BE USED TO DEPICT THE EXISTING CONDITIONS AT THE TIME OF SURVEY.
2. NORTH ORIENTATION DEPICTED HEREON IS APPROXIMATE NORTH AMERICAN DATUM 1983 (NAD83) BASED UPON GLOBAL POSITIONING SYSTEM OBSERVATIONS, OBSERVED ON AUGUST 15 2018.
3. VERTICAL DATUM DEPICTED HERE ON IS BASED ON REFERENCE MAP 1.
4. THE LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN HEREON ARE BASED ON THE LOCATION OF ABOVE GROUND STRUCTURES AND RECORD DRAWINGS PROVIDED BY OTHERS. NO EXCAVATIONS WERE MADE DURING THE PROGRESS OF THIS SURVEY TO LOCATE BURIED UTILITIES/STRUCTURES. ALL SUBTERRANEAN FEATURES AND IMPROVEMENTS MAY NOT BE DEPICTED OR NOTED HEREON. THE LOCATIONS OF UNDERGROUND UTILITIES/STRUCTURES MAY VARY FROM LOCATIONS SHOWN HEREON. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED. CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION OPERATIONS.
5. THE FIELD SURVEY WAS COMPLETED ON AUGUST 23, 2019.

**REFERENCE MAPS**

1. PROPERTY / TOPOGRAPHIC SURVEY, LEDYARD HIGH SCHOOL PARCELS, COLONEL LEDYARD HIGHWAY & GALLUP HILL ROAD, LEDYARD, CONNECTICUT. SCALE: 1"=80', DATED APRIL 9, 2002, PROJECT NO. 2250-01, SHEET 1 OF 1, PREPARED BY: MILONE & MACBROOM

"TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON."

70016  
JOHN U. FAULISE JR., L.S. LICENSE NO. DATE



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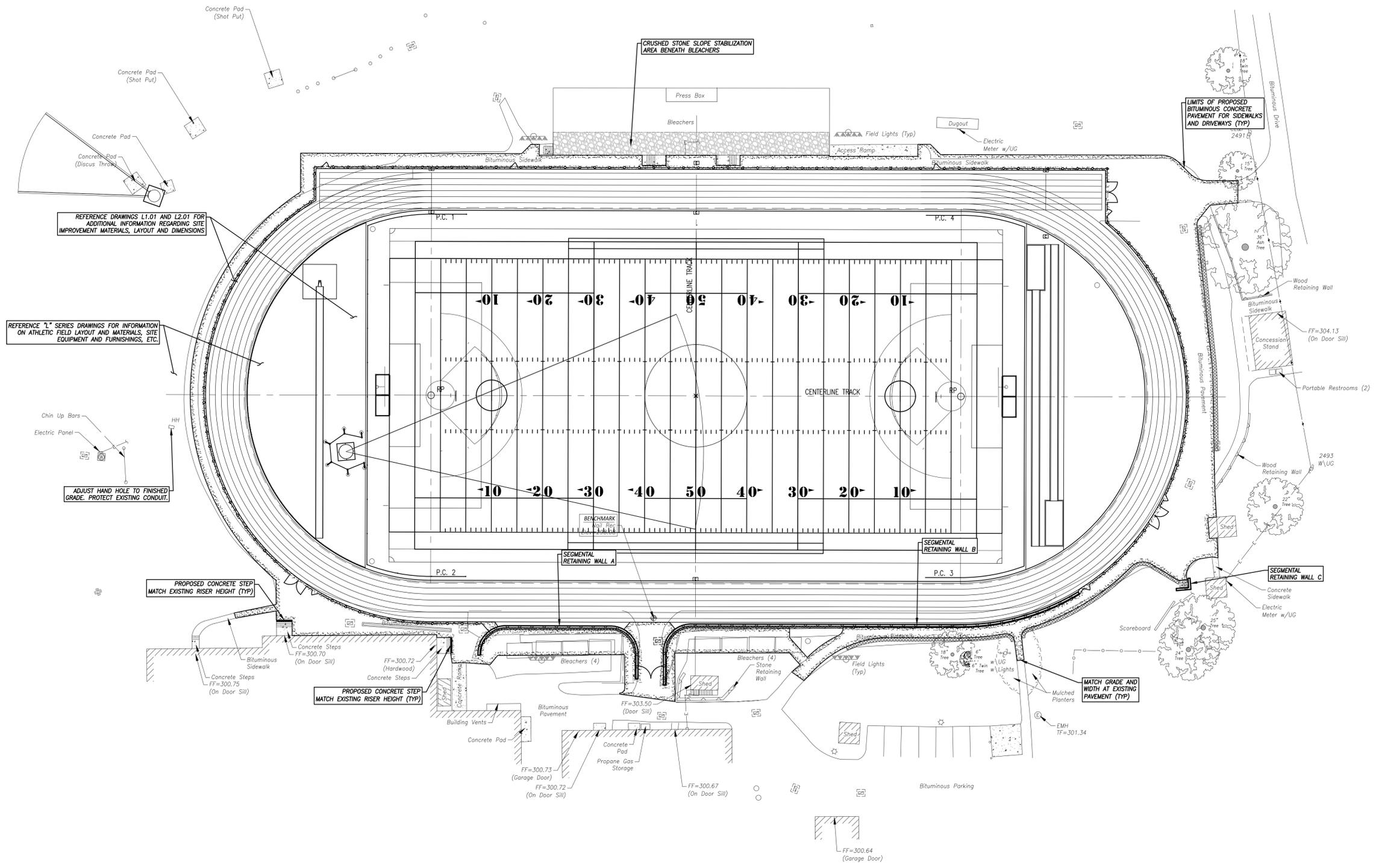
**LEDYARD HIGH SCHOOL  
TRACK & FIELD  
RENOVATIONS**

24 GALLUP HILL RD.  
LEDYARD, CT 06339

PROJECT NO.: 19-2752 DRAWN BY: **DM**

**SITE  
IMPROVEMENTS  
PLAN**

DRAWING NO.:  
**C4.01**



REFERENCE DRAWINGS L1.01 AND L2.01 FOR ADDITIONAL INFORMATION REGARDING SITE IMPROVEMENT MATERIALS, LAYOUT AND DIMENSIONS

REFERENCE 7" SERIES DRAWINGS FOR INFORMATION ON ATHLETIC FIELD LAYOUT AND MATERIALS, SITE EQUIPMENT AND FURNISHINGS, ETC.

ADJUST HAND HOLE TO FINISHED GRADE. PROTECT EXISTING CONDUIT.

PROPOSED CONCRETE STEP MATCH EXISTING RISER HEIGHT (TYP)

PROPOSED CONCRETE STEP MATCH EXISTING RISER HEIGHT (TYP)

MATCH GRADE AND WIDTH AT EXISTING PAVEMENT (TYP)

LIMITS OF PROPOSED BITUMINOUS CONCRETE PAVEMENT FOR SIDEWALKS AND DRIVEWAYS (TYP)

SEGMENTAL RETAINING WALL C

SEGMENTAL RETAINING WALL B

SEGMENTAL RETAINING WALL A

FF=304.13 (On Door Sill)

2493 W\UG

EMH TF=301.34

FF=300.67 (On Door Sill)

FF=300.72 (On Door Sill)

FF=300.73 (Garage Door)

FF=300.72 (Hardwood)

FF=300.70 (On Door Sill)

FF=300.75 (On Door Sill)

FF=300.64 (Garage Door)

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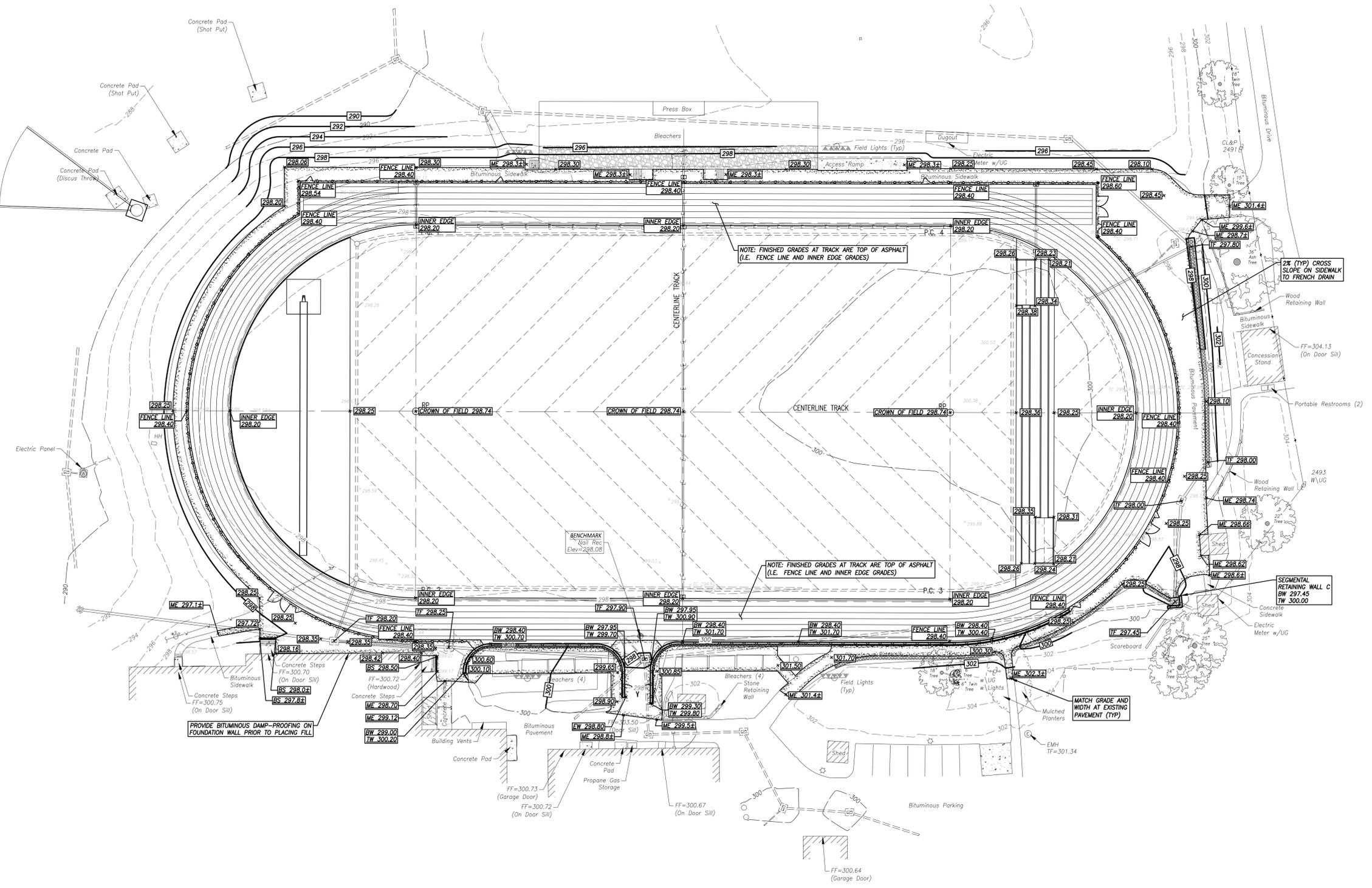


**LEDYARD HIGH SCHOOL  
TRACK & FIELD  
RENOVATIONS**

24 GALLUP HILL RD.  
LEDYARD, CT 06339

PROJECT NO.: 19-2752 DRAWN BY: **DM**

**SITE GRADING  
PLAN**



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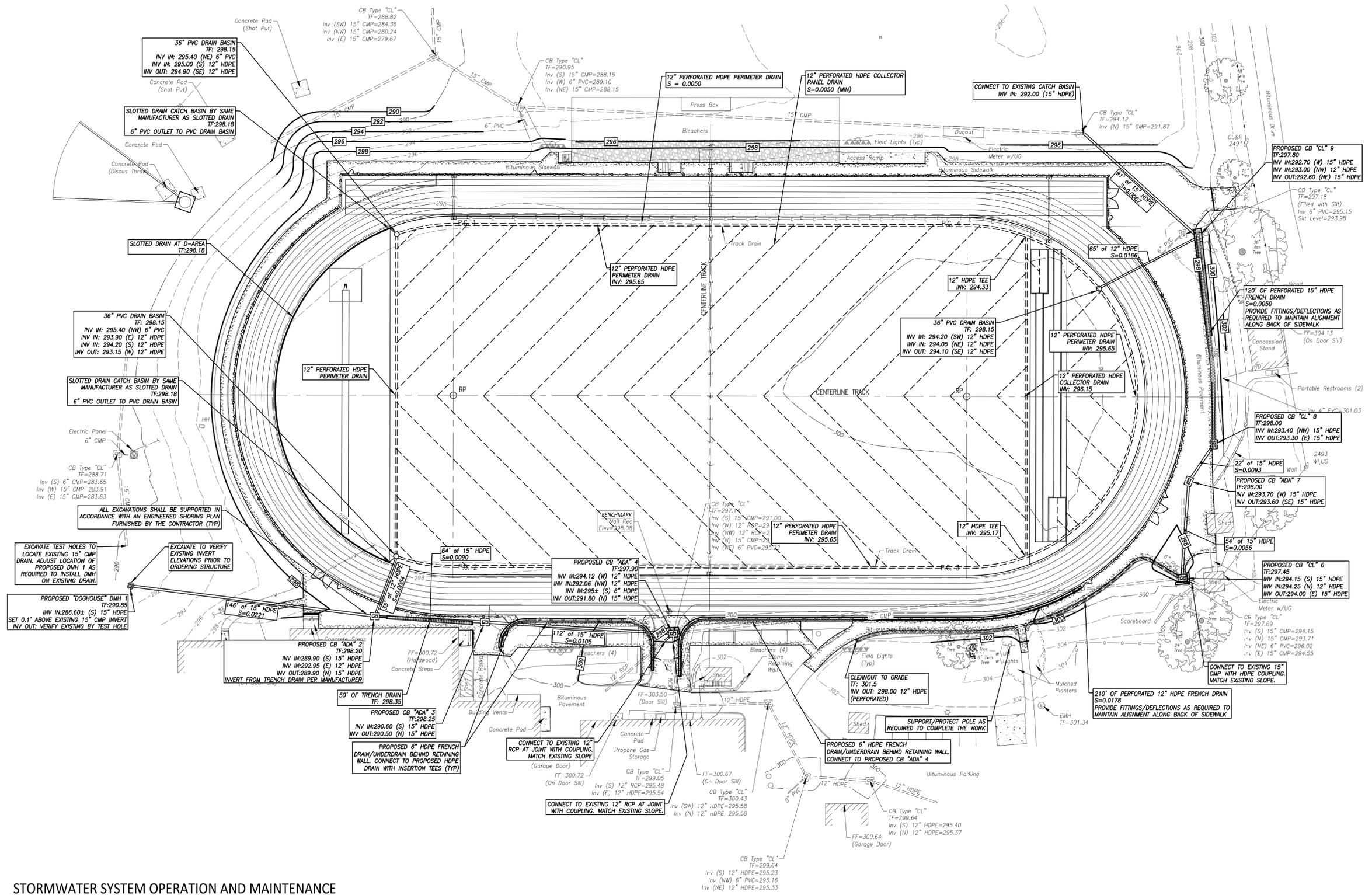
**LEDYARD HIGH SCHOOL  
TRACK & FIELD  
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24 GALLUP HILL RD.  
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PROJECT NO.: 19-2752 DRAWN BY: **DM**

**STORMWATER  
MANAGEMENT  
PLAN**

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DRAWING NO.: **C6.01**



**STORMWATER SYSTEM OPERATION AND MAINTENANCE**

1. THE PROPOSED STORMWATER MANAGEMENT SYSTEM INCLUDES DEEP SUMP CATCH BASINS, DRAINAGE MANHOLES, AND UNDERDRAIN SYSTEMS.
  - 1.1. CATCH BASINS SHALL BE INSPECTED ANNUALLY, AS SOON AS POSSIBLE FOLLOWING THE SNOW AND ICE REMOVAL SEASON, PREFERABLY PRIOR TO SPRING RAINFALL EVENTS. CATCH BASIN CLEANING SHOULD OCCUR IF SEDIMENT HAS FILLED ONE HALF OF THE TOTAL SUMP DEPTH (I.E. LESS THAN TWO FT FROM THE INVERT OF THE OUTLET PIPE TO THE SEDIMENT DEPOSIT.) SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS.
  - 1.2. DRAINAGE MANHOLES SHALL BE INSPECTED ANNUALLY, AS SOON AS POSSIBLE FOLLOWING THE SNOW AND ICE REMOVAL SEASON, PREFERABLY PRIOR TO SPRING RAINFALL EVENTS. MANHOLE CLEANING SHOULD OCCUR IF SEDIMENT OR DEBRIS HAS ACCUMULATED IN THE STRUCTURE. SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS.
  - 1.3. UNDERDRAIN SYSTEMS SHALL BE INSPECTED ANNUALLY, AS SOON AS POSSIBLE FOLLOWING THE SNOW AND ICE REMOVAL SEASON, DURING A RAIN EVENT OF 0.5 INCHES OR GREATER OF TOTAL RAINFALL. THE SURFACES OF THE AREAS IN THE VICINITY OF THE UNDERDRAINS SHALL BE INSPECTED FOR PONDED OR COLLECTED RUNOFF. IF PONDED WATER IS NOTED DURING THE INSPECTION THE UNDERDRAIN SYSTEM SHALL BE FLUSHED USING THE DRAIN BASIN ACCESS POINTS.
2. STORMWATER MANAGEMENT SYSTEM MAINTENANCE MAY BE REDUCED BY IMPLEMENTING A STREET SWEEPING PROGRAM, TO BE PERFORMED AT LEAST ANNUALLY IMMEDIATELY FOLLOWING THE SNOW AND ICE REMOVAL SEASON.

DATE	DESCRIPTION
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10/2/2019	ADDENDA 2

DATE	REVISIONS	REFERENCE

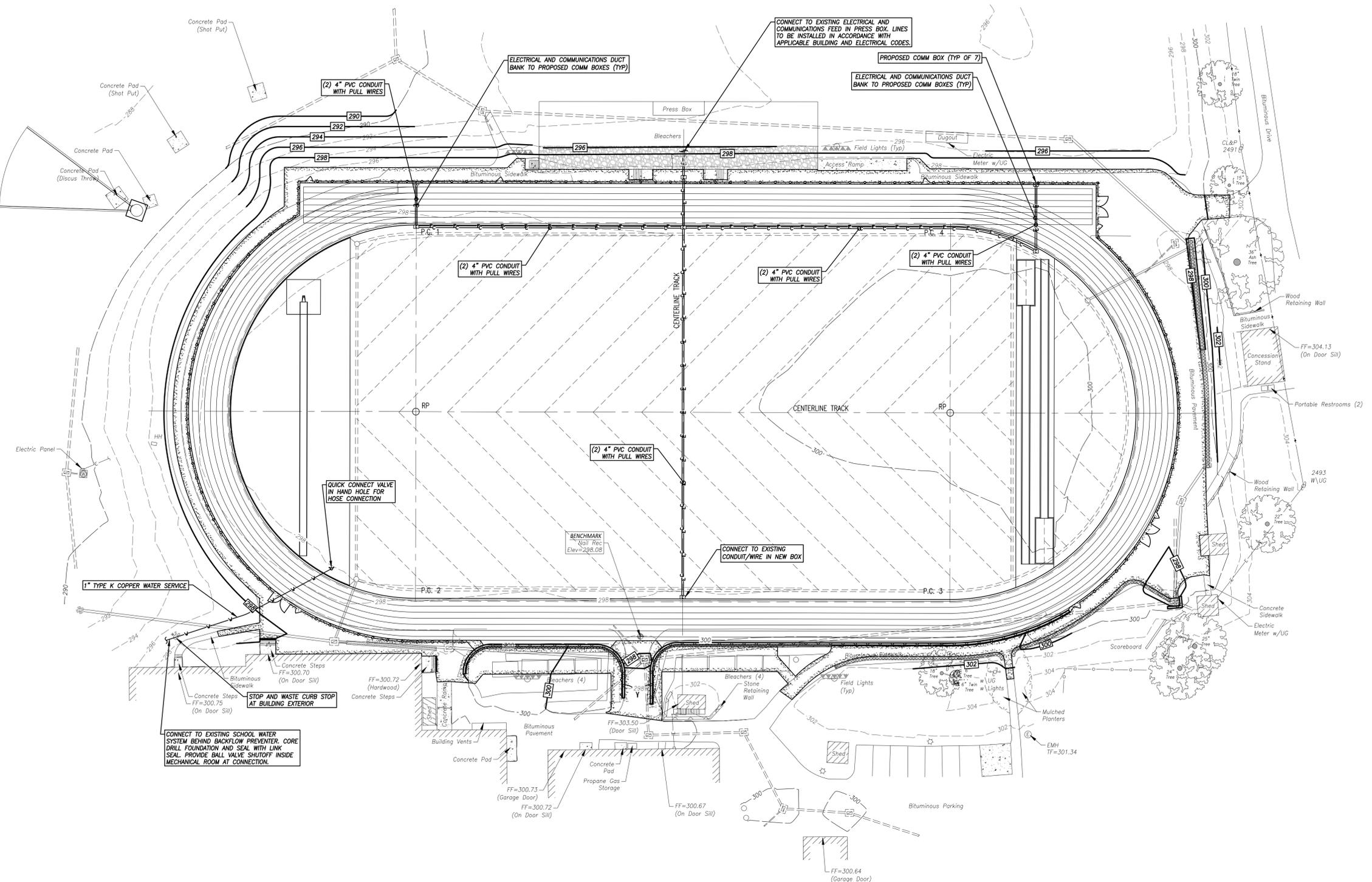


**LEDYARD HIGH SCHOOL  
TRACK & FIELD  
RENOVATIONS**

24 GALLUP HILL RD.  
LEDYARD, CT 06339

PROJECT NO.: 19-2752 DRAWN BY: DM

**SITE UTILITIES  
PLAN**



ISSUE DATE	
DATE	DESCRIPTION
9/6/2019	BID DOCUMENTS
9/30/2019	ADDENDA
10/2/2019	ADDENDA 2

REVISIONS	
DATE	REFERENCE



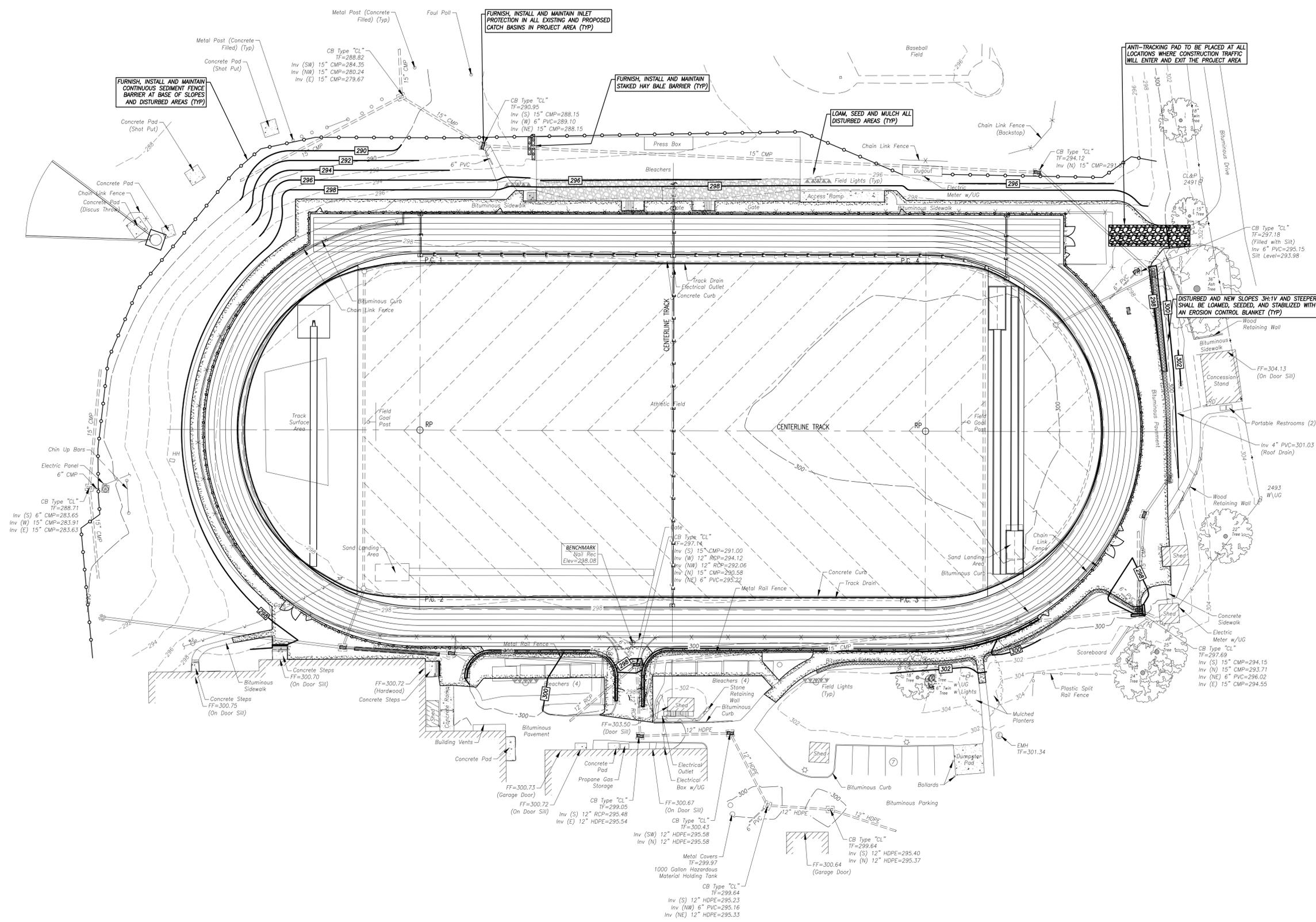
**LEDYARD HIGH SCHOOL  
TRACK & FIELD  
RENOVATIONS**

24 GALLUP HILL RD.  
LEDYARD, CT 06339

PROJECT NO.: 19-2752 DRAWN BY: DM

**EROSION AND  
SEDIMENTATION  
CONTROL PLAN**

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DRAWING NO.: **C8.01**



## SOIL EROSION AND SEDIMENTATION CONTROL NARRATIVE

THIS PROPOSAL CONSISTS OF THE REPLACEMENT OF THE EXISTING LEDYARD HIGH SCHOOL TRACK, FOOTBALL FIELD AND ASSOCIATED APURTENANCES. THE PROJECT IS LOCATED AT 24 GALLUP HILL ROAD IN THE TOWN OF LEDYARD. THE PROPERTY IS APPROXIMATELY 30.09 ACRES AND THE PROJECT AREA IS APPROXIMATELY 4.5 ACRES.

ON-SITE IMPROVEMENTS WILL INCLUDE: REPLACEMENT TRACK AND ASSOCIATED EQUIPMENT, NEW TURF ATHLETIC FIELD, REPLACEMENT CIRCULATION DRIVES AND WALKWAYS, AND STORMWATER MANAGEMENT IMPROVEMENTS.

THERE ARE NO INLAND WETLANDS LOCATED WITHIN 100 FEET OF THE PROJECT AREA.

CONTINUOUS SEDIMENT BARRIERS WILL BE INSTALLED AT LOCATIONS SHOWN ON THIS PLAN PRIOR TO ANY EARTHWORK OPERATIONS. THESE MEASURES WILL BE MAINTAINED UNTIL ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED. MEASURES DEPICTED HEREON REPRESENT THE MINIMUM ACCEPTABLE.

## REFERENCE IS MADE TO

- CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, MAY 2002.
- UNITED STATES DEPARTMENT OF AGRICULTURE (USDA), NATURAL RESOURCES CONSERVATION SERVICE (NRCS), WEB SOIL SURVEY (WSS) FOR THE STATE OF CONNECTICUT.
- CONNECTICUT DEPARTMENT OF TRANSPORTATION (CT DOT) STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, FACILITIES AND INCIDENTAL CONSTRUCTION, FORM B17 AS AMENDED.

## DEVELOPMENT SCHEDULE

PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS TO SCHEDULE A MANDATORY PRE-CONSTRUCTION MEETING ON-SITE TO DISCUSS ISSUES AS THEY RELATE TO THE PROPOSED PROJECT. THESE ISSUES WILL INCLUDE BUT NOT BE LIMITED TO:

- RESOURCE PROTECTION.
- CONSTRUCTION VEHICLE ACCESS, PARKING, AND FUELING.
- CONSTRUCTION METHODS AND SCHEDULING.
- EXISTING SITE UTILITIES AND MARK-OUT COORDINATION.
- MATERIAL DELIVERY AND STOCKPILING.
- MAINTENANCE OF TRAFFIC AND SITE SAFETY.
- SITE INSPECTION PROCEDURES AND AS-BUILT DRAWINGS.

### SUGGESTED SEQUENCE OF CONSTRUCTION:

#### PHASE 1 - INSTALLATION OF EROSION CONTROLS

- OBTAIN APPROPRIATE PERMITS, NOTIFY TOWN OFFICIALS OF CONSTRUCTION COMMENCEMENT, AND SUBMIT CONSTRUCTION TIMETABLE.
- FLAG THE LIMITS OF CONSTRUCTION AND CLEARING LIMITS.
- INSTALL THE CONSTRUCTION ENTRANCE/ANTI-TRACKING PAD AND CONTRACTOR PARKING/LAYDOWN AREA.
- ON-SITE CONSTRUCTION SEQUENCE SHALL START WITH THE MINIMUM AMOUNT OF CLEARING REQUIRED TO INSTALL GEOTEXTILE SEDIMENT FENCE, SEDIMENT AND EROSION CONTROL BERMS, AND/OR HAY/STRAW BALES AND ALL DRAINAGE INLET PROTECTION MEASURES AS SHOWN ON PLAN.
- INSTALL SEDIMENT FENCE AND HAY/STRAW BALES AS SHOWN ON THE PLANS OR AS REQUIRED.
- FOLLOWING INSTALLATION OF THE EROSION CONTROLS, THE CONTRACTOR SHALL CONTACT THE TOWN AND/OR OWNER'S REPRESENTATIVE FOR INSPECTION AND APPROVAL OF INSTALLED MEASURES. NO WORK SHALL COMMENCE UNTIL ALL EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED.

#### PHASE 2 - SITE PREPARATION

- DEMOLISH EXISTING SITE FEATURES AND UTILITIES TO BE REMOVED, STRIP AND STOCKPILE TOPSOIL FROM PROPOSED GRADING AREAS AFTER EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED. THE TOPSOIL STOCKPILE SHALL BE COMPLETELY SURROUNDED WITH SILT FENCING OR EQUAL AND SEEDED IMMEDIATELY AFTER STOCKPILING IN ORDER TO STABILIZE THE SLOPE AND LIMIT SEDIMENT RUNOFF. ALL STOCKPILED TOPSOIL SHALL BE SEEDED AND MULCHED WHEN IT IS TO BE STORED FOR MORE THAN 21 DAYS FROM TIME OF STOCKPILING.
- PERFORM MASS EARTHWORK AS REQUIRED TO ESTABLISH ROUGH GRADES. PERFORM ALL CUTS AND FILLS AS REQUIRED. ESTABLISH THE SUBGRADE FOR THE TURF FIELD, TRACK, TOPSOIL AREAS AND DRIVEWAYS AND WALKWAYS AS REQUIRED.
- COMPACT SUBGRADE TO 95% MAXIMUM DENSITY PRIOR TO PLACING FILL OR SUBBASE.

#### PHASE 3 - SITE IMPROVEMENTS

- PRIOR TO INSTALLING SURFACE WATER CONTROLS SUCH AS TEMPORARY DIVERSIONS AND WATER BARS, INSPECT EXISTING CONDITIONS TO ENSURE THAT THE EROSION CONTROLS ARE STABLE. IF NOT STABLE, REVIEW DISCHARGE CONDITIONS WITH THE DESIGN ENGINEER AND IMPLEMENT ADDITIONAL STABILIZATION MEASURES PRIOR TO INSTALLING WATER SURFACE CONTROLS.
- INSTALL STORMWATER MANAGEMENT IMPROVEMENTS AND UTILITIES TO WITHIN 5 FEET OF THE BUILDING OR AS OTHERWISE MODIFIED BY THE DESIGN ENGINEER TO ADJUST FOR UNFORSEEN SITE CONDITIONS.
- PREPARE SUB-BASE FOR TURF FIELD, TRACK, ACCESS AND CIRCULATION DRIVES, SLOPES, SHOULDER AREAS, AND ANY OTHER AREA OF DISTURBANCE FOR FINAL GRADING.
- INSTALL SUB-BASE AND BASE COURSES OF GRAVEL AND DRAINAGE LAYERS.
- PLACE TOPSOIL WHERE REQUIRED. COMPLETE THE PERIMETER LANDSCAPE PLANTINGS.
- FINE GRADE, RAKE, SEED AND MULCH TO WITHIN 2 FEET OF THE CURBING.
- UPON SUBSTANTIAL COMPLETION OF THE SITE WORK AND STABILIZATION OF ALL OTHER DISTURBED AREAS, INSTALL FIRST COURSE OF PAVING.
- WHEN ALL OTHER WORK HAS BEEN COMPLETED, REPAIR AND SWEEP ALL PAVED AREAS FOR THE FINAL COURSE OF PAVING. INSPECT THE DRAINAGE SYSTEM AND CLEAN AS NEEDED.
- INSTALL FINAL COURSE OF PAVEMENT ON ACCESS AND CIRCULATION DRIVES, AND PARKING AREAS.

#### PHASE 4 - FINAL SEEDING AND CLEANUP

- ALL DISTURBED AREAS SHALL BE PREPARED WITH TOPSOIL AND SEEDED AND MULCHED ACCORDING TO THIS PLAN.
- AFTER ALL FINAL GRADED DISTURBED AREAS HAVE BEEN STABILIZED, REMOVE ALL EROSION AND SEDIMENT STRUCTURES. CLEAN ALL STORMWATER STRUCTURES OF SEDIMENT AND DEBRIS.

### ANTICIPATED CONSTRUCTION SCHEDULE

NO.	PHASE DESCRIPTION	ESTIMATED DURATION
1	INSTALLATION OF EROSION CONTROLS	1 WEEK
2	SITE PREPARATION	1 TO 2 MONTHS
3	SITE IMPROVEMENTS, UTILITIES AND STORMWATER CONTROLS	2 TO 4 MONTHS
4	SIDEWALKS, PAVING, FINAL SEEDING AND CLEANUP	1 TO 2 MONTHS

## EROSION CONTROL OPERATION AND MAINTENANCE PLAN

THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT THE PROJECT. NO CONSTRUCTION SHALL PROCEED UNTIL PROPER SEDIMENTATION AND EROSION CONTROL METHODS HAVE BEEN INSTALLED AS THE SEQUENCE OF CONSTRUCTION NECESSITATES.

MAINTENANCE OF EROSION AND SEDIMENT CONTROLS SHALL BE COMPLETED IN ACCORDANCE WITH THE CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL (2002). THE CONTRACTOR SHALL MAINTAIN A COPY OF THE GUIDELINES ON-SITE AND REFER TO THE APPROPRIATE MAINTENANCE PROCEDURES THAT SHALL BE UTILIZED DURING THE CONSTRUCTION. A SUMMARY OF THE MAINTENANCE REQUIREMENTS FOR THE PROJECT IS PROVIDED BELOW.

DURING CONSTRUCTION, ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN PROPER WORKING ORDER. DISTURBED AREAS SHALL BE KEPT TO A MINIMUM AND SHALL ONLY TAKE PLACE WHERE IMMEDIATELY REQUIRED TO FURTHER CONSTRUCTION. IT IS DESIRABLE FROM AN EROSION PREVENTION PERSPECTIVE TO MINIMIZE DISTURBED AREAS. FINAL GRADING AND SEEDING SHALL TAKE PLACE AS SOON AS PRACTICAL.

EVERY PRECAUTION SHALL BE USED DURING CONSTRUCTION TO PREVENT AND MINIMIZE THE DEGRADATION OF THE EXISTING WATER QUALITY FROM STORMWATER RUNOFF. ALL ACTIVITIES SHALL BE IN CONFORMANCE TO AND CONSISTENT WITH ALL APPLICABLE WATER QUALITY STANDARDS AND MANAGEMENT PRACTICES AS SET FORTH BY LOCAL, STATE AND FEDERAL AGENCIES.

THE SITE CONTRACTOR SHALL APPOINT AN ONSITE AGENT WHO SHALL BE PERSONALLY RESPONSIBLE FOR IMPLEMENTING THIS EROSION AND SEDIMENT CONTROL PLAN AND ENFORCING THE PRESCRIBED SAFEGUARDS DURING THE EXCAVATION AND OPERATION PERIOD. THE NAME AND CONTACT INFORMATION FOR THE EROSION CONTROL AGENT SHALL BE SUPPLIED TO THE MUNICIPAL ZONING OFFICIAL.

THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES THROUGHOUT THE PROJECT, INFORMING ALL PARTIES ENGAGED ON SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER AGENCY AND OFFICIALS OF ANY TRANSFER OF THIS RESPONSIBILITY.

ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REPAIRED, CLEANED AND/OR REPLACED AS NECESSARY THROUGHOUT THE PROJECT IN ORDER TO MAINTAIN COMPLETE AND INTEGRAL EROSION AND SEDIMENT CONTROL PROTECTION. ONCE IN PLACE, ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO REMAIN IN PLACE IN PROPER CONDITION AND BE CONTINUOUSLY MAINTAINED UNTIL FINAL SITE STABILIZATION HAS BEEN COMPLETED. FOLLOWING SUCH PERMANENT STABILIZATION, THE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE DISMANTLED, REMOVED, AND DISPOSED OF IN AN APPROVED MANNER. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES BEYOND THOSE SHOWN ON THE PLANS OR PRESCRIBED HEREIN SHALL BE PUT IN PLACE, WHENEVER NECESSARY, TO ADDRESS FIELD CONDITIONS AND/OR AS ORDERED BY THE ENGINEER OR THE MUNICIPAL ZONING OFFICIAL.

QUALIFIED PERSONNEL PROVIDED BY THE SITE CONTRACTOR SHALL INSPECT DISTURBED AREAS AND THE LOCATIONS WHERE VEHICLES ENTER AND LEAVE THE SITE. THESE AREAS SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN TWENTY-FOUR HOURS OF THE END OF A STORM OF 0.1 INCHES OR GREATER, AS MEASURED IN THE ON-SITE RAIN GAGE. THE GAGE SHALL BE FURNISHED AND INSTALLED BY THE SITE CONTRACTOR. ADDITIONAL MEASURES BEYOND THOSE INDICATED AND/OR SHOWN ON THIS PLAN SET OR PRESCRIBED HEREIN SHALL BE PUT IN PLACE, WHENEVER NECESSARY, TO ADDRESS FIELD CONDITIONS AND/OR AS ORDERED BY THE ENGINEER. WHERE SITES HAVE BEEN TEMPORARILY OR FINALLY STABILIZED, SUCH INSPECTION SHALL BE CONDUCTED AT LEAST ONCE EVERY MONTH FOR THREE CONSECUTIVE MONTHS.

NO SOIL, FILL OR OTHER MATERIALS SHALL BE DEPOSITED IN SURROUNDING INLAND WETLANDS UNLESS PERMITTED BY THE LOCAL REGULATORY AUTHORITY.

ALL TEMPORARY STORAGE AND/OR STOCKPILE AREAS SHALL BE PROPERLY STABILIZED TO PREVENT EROSION AND SUITABLY CONTAINED TO PREVENT TURBID RUNOFF.

DURING CONSTRUCTION, THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE INSPECTION AND MAINTENANCE TO ASSURE PROPER PERFORMANCE OF EROSION CONTROL MEASURES. INSPECTION AND MAINTENANCE SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:

- INSPECT ALL SEDIMENT FENCE, SEDIMENT AND EROSION CONTROL BERMS AND OTHER EROSION CONTROL MEASURES. REPAIR OR REPLACE ANY DAMAGED PORTION IN ORDER TO INSURE ITS PROPER AND EFFECTIVE OPERATION. REMOVE ACCUMULATED SEDIMENT IF REQUIRED (GREATER THAN 4" DEPTH).
- INSPECT ALL STOCKPILES. REPAIR OR REPLACE ANY DAMAGED PORTION OF EROSION CONTROL MEASURES SURROUNDING THESE AREAS IN ORDER TO PREVENT SEDIMENTATION DOWNGRADIENT.
- INSPECT GRASS RESTORED AREAS. REVEGETATE ANY ERODED OR DISTURBED AREAS TO PROVIDE PERMANENT STABILIZATION. RESEED AND/OR REVEGETATE ANY AREAS THAT DO NOT HAVE A SUITABLE STAND OF GRASS OR ANY SCOURED AREAS TO PROVIDE PERMANENT STABILIZATION.
- INSPECT ANTI-TRACKING PAD. REMOVE AND DISPOSE OF PAD AND REPLACE IF PAD IS NO LONGER FUNCTIONING EFFICIENTLY OR ACCUMULATED SEDIMENT IS TO A DEPTH OF 2" BELOW THE SURFACE.
- INSPECT ALL STONE CHECK DAMS, TEMPORARY DIVERSIONS, AND WATER BARS. REMOVE ACCUMULATED SEDIMENT IF REQUIRED (BLOCKING MORE THAN 3" DEPTH OF FLOW).
- INSPECT DOWNGRADIENT AREAS OF ALL STORMWATER DISCHARGES AND DEVELOPMENT AREAS. STABILIZE ANY ERODED AREAS IF FOUND.
- INSPECT ROADWAYS ADJACENT TO THE SITE DAILY. SWEEP OR VACUUM TO REMOVE VISIBLE ACCUMULATED SEDIMENT.

## EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMP'S)

MINIMIZE DISTURBED AREA AND PROTECT NATURAL FEATURES AND SOIL

### TOPSOIL:

TOPSOIL SHALL BE REMOVED AND STOCKPILED ON SITE AND UTILIZED FOR FINAL GRADING. ADDITIONAL TOPSOIL, IF REQUIRED, SHALL BE SUPPLIED FROM AN OFF-SITE SOURCE. EXCESS MATERIALS RESULTING FROM "CUT SLOPES" IN THE AREAS OF THE PROPOSED CONSTRUCTION THAT ARE NOT INTENDED FOR REUSE SHALL BE IMMEDIATELY REMOVED FROM THE SITE. WHEN SOIL IS STOCKPILED, THE SLOPE OF THE STOCKPILE SHALL NOT EXCEED 2 HORIZONTAL TO 1 VERTICAL.

INSTALLATION SCHEDULE: AS NOTED, EXCAVATED TOPSOIL SHALL BE STOCKPILED ON SITE. SEDIMENT FENCE SHALL BE PLACED AROUND ANY STOCKPILES THAT ARE NOT IMMEDIATELY REMOVED FROM THE SITE TO PROTECT THE EXISTING DRAINAGE SYSTEM AND OFF SITE AREAS. STOCKPILES SHALL BE SEEDED WITH ANNUAL RYE GRASS.

MAINTENANCE AND INSPECTION: THE CUT AND FILL AREAS SHALL BE INSPECTED WEEKLY FOR EROSION. THESE AREAS SHALL BE STABILIZED IMMEDIATELY WITH EROSION CONTROLS OR GRADED TO AVOID POSSIBLE DISTURBANCE TO THE EXISTING DRAINAGE SYSTEM OR OFF SITE AREAS. SEE ALSO MAINTENANCE AND INSPECTION PROCEDURES FOR SEDIMENT FENCE.

### CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT

#### AREA FOR SILT TO ACCUMULATE:

BMP/INSTALLATION SCHEDULE: BEFORE ANY GRADING OPERATIONS BEGIN, A SEDIMENT FENCE SHALL BE INSTALLED ADJACENT TO THE AREAS UNDER CONSTRUCTION JUST OUTSIDE THE LIMITS OF DISTURBANCE.

OTHER ADJACENT OFF SITE AREAS WILL ALWAYS BE PROTECTED BY A SEDIMENT FENCE OR ANOTHER BMP UNTIL FINAL STABILIZATION IS ACHIEVED.

MAINTENANCE AND INSPECTION: THE GRADED AREAS AND SEDIMENT FENCE WILL BE INSPECTED WEEKLY TO ENSURE THAT THERE ARE NO STRUCTURAL FAILURES AND IMMEDIATELY AFTER RAIN EVENTS.

### CONSTRUCTION SPECIFICATIONS

#### SEDIMENT FENCE:

- THE MATERIAL FOR SEDIMENT FENCES SHOULD BE A PEROUS SHEET OF SYNTHETIC FABRIC SUCH AS POLYPROPYLENE, NYLON, POLYESTER, OR POLYETHYLENE YARN.
- THE STAKES USED TO ANCHOR THE FILTER FABRIC SHOULD BE WOOD OR METAL. WOODEN STAKES SHOULD BE AT LEAST 3 FEET LONG AND HAVE A MINIMUM DIAMETER OF 2 INCHES IF A HARDWOOD LIKE OAK IS USED. STAKES FROM SOFT WOODS LIKE PINE SHOULD BE AT LEAST 4 INCHES IN DIAMETER.
- ERECT SEDIMENT FENCE IN A CONTINUOUS FASHION FROM A SINGLE ROLL OF FABRIC TO ELIMINATE GAPS IN THE FENCE. IF A CONTINUOUS ROLL OF FABRIC IS NOT AVAILABLE, OVERLAP THE FABRIC FROM BOTH DIRECTIONS ONLY AT STAKES OR POSTS. OVERLAP AT LEAST 6 INCHES. EXCAVATE A TRENCH TO BURY THE BOTTOM OF THE FABRIC FENCE AT LEAST 6 INCHES BELOW THE GROUND SURFACE. THIS HELPS TO PREVENT GAPS FROM FORMING NEAR THE GROUND SURFACE. GAPS WOULD MAKE THE FENCING USELESS AS A SEDIMENT BARRIER.
- THE HEIGHT OF THE FENCE POSTS SHOULD BE 16 TO 34 INCHES ABOVE THE ORIGINAL GROUND SURFACE. SPACE THE POSTS NO MORE THAN 10 FEET APART.
- THE FENCE SHOULD BE DESIGNED TO WITHSTAND THE RUNOFF FROM A 10-YEAR PEAK STORM EVENT. ONCE INSTALLED, IT SHOULD REMAIN IN PLACE UNTIL ALL AREAS UPSLOPE HAVE BEEN PERMANENTLY STABILIZED BY VEGETATION OR OTHER MEANS.

#### INSTALLATION:

- DIG A 6" DEEP TRENCH ON THE UPHILL SIDE OF THE PROPOSED BARRIER LOCATION.
  - POSITION THE POSTS ON THE DOWNHILL SIDE OF THE FABRIC BARRIER AND DRIVE THE POST 12" INTO THE GROUND.
  - LAY THE BOTTOM 6" OF THE FABRIC BARRIER IN THE TRENCH TO PREVENT UNDERMINING AND BACKFILL.
- MAINTENANCE:**
- SEDIMENT SHOULD BE REMOVED ONCE IT HAS ACCUMULATED TO 4" DEPTH.
  - FILTER FABRIC SHOULD BE REPLACED WHENEVER IT HAS DEGRADED TO SUCH AN EXTENT THAT THE EFFECTIVENESS OF THE FABRIC IS REDUCED (APPROXIMATELY SIX MONTHS).
  - SEDIMENT FENCE SHOULD REMAIN IN PLACE UNTIL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
  - ALL SEDIMENT ACCUMULATED AT THE FENCE SHOULD BE REMOVED AND PROPERLY DISPOSED OF BEFORE THE FENCE IS REMOVED.

#### INSPECTION:

- INSPECT SEDIMENT FENCE BEFORE ANTICIPATED STORM EVENTS (OR SERIES OF STORM EVENTS SUCH AS INTERMITTENT SHOWERS OVER ONE OR MORE DAYS) AND WITHIN 24 HOURS AFTER THE END OF A STORM EVENT OF 0.1 INCHES OR GREATER, AND AT LEAST ONCE EVERY SEVEN CALENDAR DAYS, AT LEAST 72 HOURS APART.
- WHERE SITES HAVE BEEN FINALLY OR TEMPORARILY STABILIZED, SUCH INSPECTIONS MAY BE CONDUCTED ONCE PER MONTH.

### HAY/STRAW BALE BARRIER

#### INSTALLATION:

- EXCAVATE TRENCH 4" AND PLACE MATERIAL UP SLOPE OF TRENCH.
- PLACE BALES IN A SINGLE ROW IN THE TRENCH, LENGTHWISE, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER AND THE BINDINGS ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES (TO AVOID PREMATURE ROTTING OF THE BINDINGS).
- ANCHOR EACH BALE WITH AT LEAST 2 STAKES, DRIVING THE FIRST STAKE IN EACH BALE TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER. STAKES MUST BE DRIVEN A MINIMUM OF 18 INCHES INTO THE GROUND. FILL ANY GAPS BETWEEN THE BALES WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES.
- BACKFILL THE BALES WITH THE EXCAVATED TRENCH MATERIAL TO A MINIMUM DEPTH OF 4 INCHES ON THE UPHILL SIDE OF THE BALES. TIME AND OR MACHINE AND COMPACT THE SOIL. LOOSE HAY/STRAW SCATTERED OVER THE DISTURBED AREA IMMEDIATELY UPHILL FROM THE HAY BALE BARRIER TENDS TO INCREASE BARRIER EFFICIENCY.

#### MAINTENANCE:

- INSPECT THE HAY/STRAW BALE BARRIER AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL AMOUNT OF 0.1 INCH OR GREATER TO DETERMINE MAINTENANCE NEEDS. FOR DEWATERING OPERATIONS, INSPECT FREQUENTLY BEFORE, DURING, AND AFTER PUMPING OPERATIONS. REMOVE THE SEDIMENT DEPOSITS WHEN SEDIMENT DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
- REPLACE OR REPAIR THE BARRIER WITHIN 24 HOURS OF OBSERVED FAILURE. FAILURE OF THE BARRIER HAS OCCURRED WHEN SEDIMENT FAILS TO BE RETAINED BY THE BARRIER BECAUSE:
  - THE BARRIER HAS BEEN OVERTOPPED, UNDERCUT OR BYPASSED BY RUNOFF WATER.
  - THE BARRIER HAS BEEN MOVED OUT OF POSITION, OR
  - THE BALES HAVE DETERIORATED OR BEEN DAMAGED.
- WHEN REPETITIVE FAILURES OCCUR AT THE SAME LOCATION, REVIEW CONDITIONS AND LIMITATIONS FOR USE AND DETERMINE IF ADDITIONAL CONTROLS ARE NEEDED TO REDUCE FAILURE RATE OR REPLACE HAY/STRAW BALE BARRIER.
- MAINTAIN THE HAY/STRAW BALE BARRIER UNTIL THE CONTRIBUTING AREA IS STABILIZED. AFTER THE UP SLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED, PULL THE STAKES OUT OF THE HAY BALES. REMOVE SEDIMENT.

### DUST CONTROL:

DUST FROM THE SITE WILL BE CONTROLLED BY USING A MOBILE PRESSURE-TYPE DISTRIBUTOR TRUCK THAT WILL APPLY CLEAN WATER AT RATE OF 300 GALLONS PER ACRE AND MINIMIZED AS NEEDED TO AVOID PONDING.

INSTALLATION SCHEDULE: DUST CONTROL WILL BE IMPLEMENTED AS NEEDED ONCE SITE GRADING HAS BEEN INITIATED, AND DURING WINDY CONDITIONS EXCEEDING 20MPH. WHILE SITE GRADING IS OCCURRING, SPRAYING OF WATER WILL BE PERFORMED ONCE PER DAY DURING THE MONTHS OF MARCH THROUGH MAY AND NO MORE THAN THREE TIMES PER DAY FROM JUNE TO SEPTEMBER OR WHENEVER DRYNESS OF SOIL WARRANTS IT.

MAINTENANCE SCHEDULE: AT LEAST ONE MOBILE UNIT WILL BE AVAILABLE AT ALL TIMES DURING CONSTRUCTION TO APPLY WATER. EACH MOBILE UNIT SHALL BE EQUIPPED WITH A POSITIVE SHUTOFF VALVE TO PREVENT OVER WATERING OF DISTURBED AREAS.

## SPILL PREVENTION AND CONTROL PLAN

- DUMPING OF OIL OR OTHER DELETERIOUS MATERIALS ON THE GROUND IS FORBIDDEN. THE CONTRACTOR SHALL PROVIDE A MEANS OF CATCHING, RETAINING AND PROPERLY DISPOSING OF DRAINED OIL, REMOVED OIL FILTERS, OR OTHER DELETERIOUS MATERIAL FROM EQUIPMENT USED ON-SITE. MAJOR VEHICLE MAINTENANCE SHALL BE COMPLETED OFF-SITE. ALL OIL SPILLS SHALL BE IMMEDIATELY REPORTED TO THE DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION/HAZARDOUS MATERIALS OFFICE. FAILURE TO DO SO MAY RESULT IN THE IMPOSITION OF FINES UNDER THE APPLICABLE CONNECTICUT GENERAL STATUTES.

- VEHICLE FUELING: REFUELING OF VEHICLES AND EQUIPMENT SHALL BE CONDUCTED IN A DESIGNATED LAYDOWN AREA AT LEAST 100 FEET FROM WETLANDS OR DRAINAGE STRUCTURES. THE LOCATION WITHIN THE LAYDOWN AREA SHALL BE COMPOSED OF AN IMPERVIOUS SURFACE WITHOUT ACCESS TO ANY SUBSURFACE DRAINAGE STRUCTURES. A SPILL CLEANUP KIT SHALL BE MAINTAINED AT THE FUELING LOCATION.

- HAZARDOUS MATERIAL STORAGE: HAZARDOUS MATERIALS INCLUDING BUT NOT LIMITED TO FUEL, OIL AND PETROLEUM PRODUCTS AND SOLVENTS WILL BE STORED IN AN APPROVED COVERED STORAGE UNIT AND PROVIDED WITH SECURED SECONDARY CONTAINMENT WITH AN IMPERVIOUS FLOOR IN ACCORDANCE WITH FEDERAL AND STATE REGULATIONS.

- MATERIAL SAFETY DATA SHEETS, A MATERIAL INVENTORY, AND EMERGENCY CONTACT INFORMATION WILL BE MAINTAINED AT THE ON-SITE PROJECT TRAILER.

- SPILL KITS: SPILL KITS WILL BE STORED WITHIN THE MATERIAL STORAGE AREA, CONCRETE WASHOUT AREAS, AND DESIGNATED FUELING AREA.

- SPILLS: ALL SPILLS WILL BE CLEANED UP IMMEDIATELY UPON DISCOVERY. SPENT ABSORBENT MATERIALS AND RAGS SHALL BE PLACED IN A SEALED BAG AND WILL BE HULLED OFF-SITE IMMEDIATELY AFTER THE SPILL IS CLEANED UP FOR DISPOSAL AT THE APPROPRIATE LANDFILL. SPILLS OR RELEASES OF HAZARDOUS CHEMICALS OR PETROLEUM PRODUCTS SHALL BE PROMPTLY REPORTED TO CTDEEP AT 1-800-424-3338 AND THE NATIONAL RESPONSE CENTER 1-800-424-8802.

- IN ACCORDANCE WITH CONNECTICUT GENERAL STATUTES THE CONTRACTOR SHALL, WITHIN 24 HOURS OF VERBAL NOTIFICATION, COMPLETE A WRITTEN REPORT OF PETROLEUM OR CHEMICAL PRODUCT DISCHARGE, SPILLAGE OR RELEASE AND MAIL IT TO: CTDEEP, BUREAU OF WASTE MANAGEMENT, 79 ELM STREET, HARTFORD, CT, 06106-5127.

- INSTALLATION SCHEDULE: THE SPILL PREVENTION AND CONTROL PROCEDURES WILL BE IMPLEMENTED ONCE CONSTRUCTION BEGINS ON-SITE.

## SPILL PREVENTION AND CONTROL BMP'S

### MATERIAL HANDLING AND WASTE MANAGEMENT:

#### WASTE MATERIALS:

ALL WASTE MATERIALS SHALL BE COLLECTED AND DISPOSED OF INTO METAL WASTE DUMPSTERS IN DESIGNATED AREAS. DUMPSTERS SHALL HAVE A SECURE TIGHT LID, BE PLACED AWAY FROM STORM WATER DRAINS AND STRUCTURES, AND SHALL MEET ALL FEDERAL, STATE, AND LOCAL REGULATIONS. ONLY TRASH AND CONSTRUCTION DEBRIS SHALL BE PLACED IN THE DUMPSTERS. CONSTRUCTION MATERIALS SHALL NOT BE BURIED ON SITE.

MAINTENANCE AND INSPECTION: THE DUMPSTERS SHALL BE INSPECTED WEEKLY AND IMMEDIATELY AFTER STORM EVENTS. THE DUMPSTER SHALL BE EMPTIED AS FREQUENTLY AS NEEDED, AND TAKEN TO AN APPROPRIATE LANDFILL.

#### HAZARDOUS WASTE MATERIALS:

BMP DESCRIPTION: ALL HAZARDOUS WASTE MATERIALS INCLUDING OIL FILTERS, PETROLEUM PRODUCTS, PAINT, AND EQUIPMENT MAINTENANCE FLUIDS SHALL BE STORED IN STRUCTURALLY SOUND AND SEALED SHIPPING CONTAINERS IN A DESIGNATED AREA. HAZARDOUS WASTE MATERIALS SHALL BE STORED IN APPROPRIATE AND CLEARLY MARKED CONTAINERS AND SEGREGATED FROM OTHER NON-WASTE MATERIALS. SECONDARY CONTAINMENT WILL BE PROVIDED FOR ALL WASTE MATERIALS IN A DESIGNATED AREA AND SHALL CONSIST OF COMMERCIALLY AVAILABLE SPILL PALLETS. ADDITIONALLY, ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. HAZARDOUS WASTE MATERIALS SHALL NOT BE DISPOSED OF INTO THE ON-SITE DUMPSTERS.

MAINTENANCE AND INSPECTION: THE HAZARDOUS WASTE MATERIALS AREA SHALL BE INSPECTED WEEKLY AND AFTER STORM EVENTS. THE STORAGE AREA SHALL BE KEPT CLEAN, WELL ORGANIZED AND EQUIPPED WITH AMPLE CLEANUP SUPPLIES AS APPROPRIATE FOR THE MATERIALS BEING STORED. MATERIAL SAFETY DATA SHEETS, MATERIAL INVENTORY, AND EMERGENCY CONTACT NUMBERS SHALL BE MAINTAINED IN THE OFFICE TRAILER.

#### SANITARY WASTE:

BMP DESCRIPTION: PORTABLE TOILETS, LOCATED IN THE STAGING AREA, SHALL BE PROVIDED AT THE SITE THROUGHOUT THE CONSTRUCTION PHASE. THE TOILETS SHALL BE LOCATED AWAY FROM CONCENTRATED DRAINAGE FLOW PATHS.

MAINTENANCE AND INSPECTION: SANITARY WASTE SHALL BE COLLECTED A MINIMUM OF ONCE A WEEK AND SHALL BE INSPECTED WEEKLY FOR EVIDENCE OF LEAKING HOLDING TANKS.

#### RECYCLING:

BMP DESCRIPTION: WOOD PALLETS, CARDBOARD BOXES, AND OTHER RECYCLABLE CONSTRUCTION SCRAPS SHALL BE DISPOSED OF IN A DESIGNATED DUMPSTER FOR RECYCLING. THE DUMPSTER SHALL HAVE A SECURE WATERTIGHT LID, BE PLACED AWAY FROM STORMWATER CONVEYANCES AND DRAINS AND MEET ALL LOCAL AND STATE SOLID-WASTE MANAGEMENT REGULATIONS. ONLY SOLID RECYCLABLE CONSTRUCTION SCRAPS FROM THE SITE SHALL BE DEPOSITED IN THE DUMPSTER.

MAINTENANCE AND INSPECTION: THE RECYCLING DUMPSTER SHALL BE INSPECTED WEEKLY. THE RECYCLING DUMPSTER SHALL BE EMPTIED WHEN FULL AND TAKEN TO AN APPROVED RECYCLING CENTER BY THE CONTRACTOR. IF RECYCLABLE CONSTRUCTION WASTES ARE EXCEEDING THE DUMPSTER'S CAPACITY, THE DUMPSTERS SHALL BE EMPTIED MORE FREQUENTLY.

### DESIGNATE WASHOUT AREAS:

#### CONCRETE WASHOUT

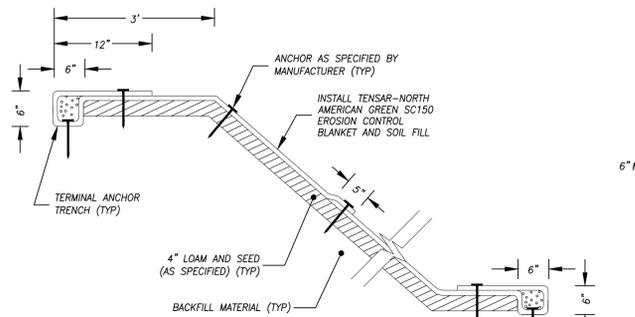
BMP DESCRIPTION: A TEMPORARY, ABOVE-GRADE CONCRETE WASHOUT AREA SHALL BE DESIGNATED. WHEN THE TEMPORARY WASHOUT AREA IS NO LONGER NEEDED FOR THE CONSTRUCTION PROJECT, THE HARDENED CONCRETE AND MATERIALS USED TO CONSTRUCT THE AREA WILL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS, AND THE AREA WILL BE STABILIZED.

INSTALLATION SCHEDULE: THE WASHOUT AREA WILL BE DESIGNATED BEFORE CONCRETE POURS OCCUR AT THE SITE.

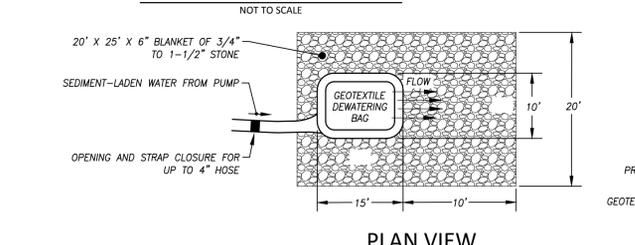
### VEHICLE FUELING AND MAINTENANCE PRACTICES:

BMP DESCRIPTION: SEVERAL TYPES OF VEHICLES AND EQUIPMENT WILL BE USED ON-SITE THROUGHOUT THE PROJECT, INCLUDING GRADERS, SCRAPERS, EXCAVATORS, LOADERS, ROLLERS, TRUCKS AND TRAILERS, BACKHOES, AND FORKLIFTS. ALL MAJOR EQUIPMENT/VEHICLE FUELING SHALL BE PERFORMING IN THE STAGING AREA. THIS PROPOSED ACTIVITY IS TO BE SITUATED SO THAT DRAINAGE FACILITIES OR WATER COURSES LOCATED IN THE AREA ARE NOT AT RISK FROM POTENTIAL INFILTRATION, ABSORBENT, SPILL-CLEANUP MATERIALS AND SPILL KITS SHALL BE AVAILABLE AT THE COMBINED STAGING AND MATERIALS STORAGE AREA. FUEL SHALL BE DELIVERED TO THE SITE ON AN AS NEEDED BASIS BY A FUEL DELIVERY SERVICE. FUELING OF EQUIPMENT SHALL ONLY OCCUR IN DESIGNATED FUELING AREAS ON AN IMPERVIOUS SURFACE. NON-EMERGENCY VEHICLE MAINTENANCE INCLUDING WASHING IS PROHIBITED ON SITE.

INSTALLATION SCHEDULE: BMP'S IMPLEMENTED FOR FUELING ACTIVITIES SHALL BEGIN AT THE START OF THE PROJECT.



## VEGETATIVE SLOPE DETAIL



### PLAN VIEW

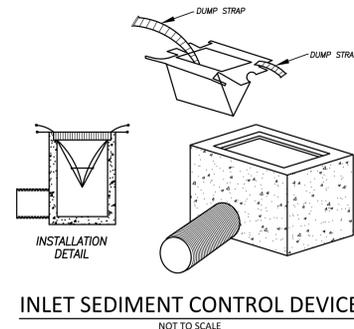
### PROFILE VIEW

### NOTES:

- GEOTEXTILE BAG MATERIAL SHALL BE A NON-WOVEN MATERIAL.
- DO NOT OVER PRESSURIZE BAG OR USE BEYOND CAPACITY.
- LOCATE DISCHARGE SITE ON FLAT UPLAND AREAS AS FAR AWAY AS POSSIBLE FROM STREAMS, WETLANDS, AND OTHER RESOURCES AND POINTS OF CONCENTRATED FLOW.
- DOWNGRADIENT FROM RECEIVING AREA MUST BE WELL VEGETATED OR OTHERWISE STABLE FROM EROSION, E.G., FOREST FLOOR OR COARSE GRAVEL/SLOPE.

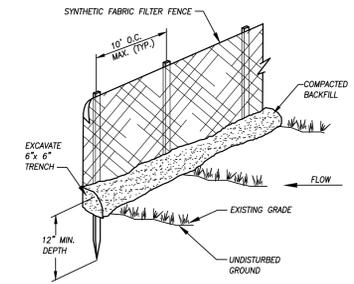
## GEOTEXTILE DEWATERING BAG

NOT TO SCALE



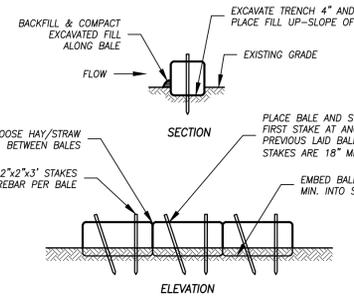
## INLET SEDIMENT CONTROL DEVICE

NOT TO SCALE



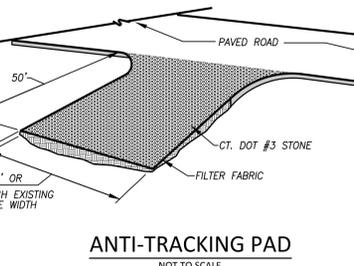
## SEDIMENT FENCE DETAIL

NOT TO SCALE



## HAY/STRAW BALE BARRIER DETAIL

NOT TO SCALE



## ANTI-TRACKING PAD

NOT TO SCALE

**KAESTLE BOOS**





ISSUE DATE	
DATE	DESCRIPTION
9/6/2019	BID DOCUMENTS
9/30/2019	ADDENDA
10/2/2019	ADDENDA 2

REVISIONS	
DATE	REFERENCE



**LEDYARD HIGH SCHOOL  
TRACK & FIELD  
RENOVATIONS**

24 GALLUP HILL RD.  
LEDYARD, CT 06339

PROJECT NO.: 19-2752 DRAWN BY: DM

**CIVIL DETAILS**

NOTE:  
SEE "L" SERIES DRAWINGS FOR BASIS OF DESIGN WALL DETAIL.

