

REQUEST FOR PROPOSAL - #2016-4

**TRACK AND FIELD IMPROVEMENTS
AT
MASUK HIGH SCHOOL
MONROE, CONNECTICUT**

April 25, 2016

MMI #5660-02

Prepared for:

Monroe Board of Education
Monroe, Connecticut

Prepared by:

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REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS

**MASUK HIGH SCHOOL
MONROE, CONNECTICUT**

CHECKLIST OF FORMS TO BE SUBMITTED WITH BID

- BID PROPOSAL FORM
- REQUIRED DISCLOSURES
- BIDDER'S NON COLLUSION AFFIDAVIT
- BIDDER'S STATEMENT OF REFERENCES
- BID BOND

THIS CHECKLIST IS PROVIDED FOR THE BIDDERS CONVENIENCE. IN NO WAY DOES THIS CHECKLIST SUPERSEDE THE SUBMITTAL REQUIREMENTS IN THE BID DOCUMENTS.

5660-02-a2516-specs-checklist-revised

TOWN OF MONROE, CONNECTICUT

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

TABLE OF CONTENTS

| | |
|--------------|---|
| Section I | Notice of Bid |
| Section II | Invitation to Bid |
| Section III | Instruction to Bidders |
| Section IV | Proposal Forms/Bid Forms: <ul style="list-style-type: none">• Bid Proposal Form• Bidder's Non-Collusive Affidavit• Bidder's Statement of References• Bid Bond• Performance Bond• Sample Contract |
| Section V | General Conditions |
| Section VI | Special Conditions |
| Section VII | Special Provisions |
| Section VIII | Prevailing Wage Rates |
| Section IX | Geotechnical Report and Test Pit Investigation |
| Section X | Synthetic In-Filled Athletic Turf RFP (For Reference Only) |

5660-02-a2516-specs-01-table of contents

SECTION I

Notice of Bid

NOTICE OF BID

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS

**MASUK HIGH SCHOOL
MONROE, CONNECTICUT**

Sealed bids will be received at the Office of Finance and Management Services for Monroe Public Schools at 375 Monroe Turnpike, Monroe CT 06468 until 2:00 p.m., Wednesday, May 11, 2016, and will be publicly opened and read at that time.

Bids must be received by the Office of Finance and Management Services in a sealed envelope marked with project name and the bidder's name and mailing address on the front of the envelope. The project includes the installation of a new synthetic turf field, track improvements and other miscellaneous improvements to the Stadium Field at Masuk High School as detailed in the bid documents.

Plans and specifications may be obtained at the Office of Finance and Management Services for Monroe Public Schools at 375 Monroe Turnpike, Monroe CT 06468 on or after Monday, April 25, 2016. There is a **\$40 nonrefundable** cost for copies of the bid documents. The bid documents are also available for download on the Monroe Public Schools website: http://www.monroeps.org/pages/monroeps/Departments/Business_Office/Request_for_Proposals

The Town of Monroe reserves the right to accept or reject any or all bids; to waive any informality, or; to accept any bid deemed in the best interests of the Town.

TOWN OF MONROE

Gabriella DiBlasi
Director of Finance and Management Services

5660-02-a2516-specs-03-notice of bid

SECTION II

Invitation to Bid

MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

INVITATION TO BID

Proposal Opening Date: May 11, 2016
Proposal Opening Time: 2:00 p.m. local time
Proposal Opening Place: Office of Finance and Management Services
Monroe Public Schools
375 Monroe Turnpike
Monroe, CT 06468

.....

The Town of Monroe is seeking sealed bids for improvements to the track and field at Masuk High School including but not limited to installation of new synthetic in-filled turf, track improvements, and other work necessary to complete the project as described in the Project Manual and construction plans.

One (1) original and two (2) copies of sealed bids must be received in the Monroe Public Schools Office by the date and time noted above. Monroe Board of Education (Monroe) will not accept submissions by e-mail or fax. Monroe will reject bids received after the date and time noted above.

Plans and specifications may be obtained at the Office of Finance and Management Services for Monroe Public Schools at 375 Monroe Turnpike, Monroe CT 06468 on or after Monday, April 25, 2016. There is a **\$40 nonrefundable** cost for copies of the bid documents. The bid documents are also available for download on the Monroe Public Schools website:

http://www.monroeps.org/pages/monroeps/Departments/Business_Office/Request_for_Proposals

Each bidder is responsible for checking the website to determine if the Monroe has issued any addenda and, if so, to complete its bid in accordance with the solicitation as modified by the addenda.

Bids must be held firm and cannot be withdrawn within 90 days of the bid submission.

The Town reserves the rights to amend or terminate this Invitation to Bid, accept all or any part of a bid, reject all bids, waive any informalities or non-material deficiencies in a bid, and award the contract to the bidder that, in Monroe's judgment, will be in their best interests.

This Invitation to Bid ("ITB" or "Invitation") includes:

- Instructions to Bidders
- Supplementary General Conditions
- Special Provisions

- Insurance Requirements
- Bid Proposal Form
- Bidder's Legal Status Disclosure
- Bidder's Non Collusion Affidavit
- Plans (entitled "Masuk High School – Track and Field Improvements" prepared by Milone & MacBroom, Inc., dated April 25, 2016.)
- Bid Bond
- Performance Bond
- Bidder's Statement of References
- State of Connecticut Department of Labor Minimum Wage Rates and Classifications Applicable to this RFP.
- Addenda, if any

5660-02-a2516-specs-05-invitation to bid

SECTION III

Instruction to Bidders

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

INSTRUCTIONS TO BIDDERS

INDEX TO INSTRUCTION TO BIDDERS

1. General
2. Key Dates
3. Preparation of Bids
4. Corrections
5. Withdrawal of Bids
6. Qualifications of the Bidder
7. Obligations of the Bidder
8. Information Supplied to Bidders
9. Taxes
10. Bid Security
11. Method of Award - Lowest Qualified Bidder
12. Execution of the Agreement
13. Liquidated Damages for Failure to Enter into Contract
14. Notice to Proceed
15. Time of Completion and Liquidated Damages
16. Addenda and Interpretations
17. Items Not Listed in the Bid
18. Balanced Bidding
19. Prices
20. Non-Discrimination
21. Employment of Labor
22. Laws and Regulations
23. Non-Resident Contractors

ARTICLE 1 – GENERAL

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities in or reject any and all bids. Conditional or qualified bids will not be accepted. Any bid received after the time and date specified shall not be considered. Should there be reasons why the contract cannot be awarded within the specified period the time may be extended by mutual agreement between the Owner and the bidder.

ARTICLE 2 – KEY DATES

| | |
|--------------------------------|---|
| Notice to Bid: | April 25, 2016 |
| Pre-Bid Meeting: | May 2, 2016 at 10:30 AM at Benedict Stadium at Masuk High School |
| Deadline to Submit Questions: | May 6, 2016 at 4:00 PM |
| Addendum to be Distributed: | May 9, 2016 |
| Bid Opening: | May 11, 2016 at 2:00 PM |
| Anticipated Notice to Proceed: | June 1, 2016 |
| Construction Commencement: | June 15, 2016 (construction cannot begin until after graduation on June 14, 2016) |
| Substantial Completion: | September 13, 2016 (90 days after Construction Commencement) |

ARTICLE 3 – PREPARATION OF BID

Each Bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in, in ink or typewritten, both in words and figures. All bids must be prepared in conformity with and shall be based on and submitted subject to all requirements of the Specifications and Drawings together with all Addenda thereto.

ARTICLE 4 – CORRECTIONS

Erasures or other changes in the bid must be explained or noted over the signature of the bidder.

ARTICLE 5 – WITHDRAWAL OF BIDS

Bids may be withdrawn personally or on written or telegraphic request dispatched by the bidder in time for delivery in the normal course of business prior to the time fixed for the opening, provided that written confirmation of any telegraphic withdrawal over the signature of the bidder is placed in the mail and postmarked prior to the time set for the opening of the bids. Negligence on the part of the bidder in

preparing their bid confers no right of withdrawal or modification of his bid after such bid has been opened.

No bidder may withdraw his bid within ninety (90) days after the actual date of the opening thereof.

ARTICLE 6 – QUALIFICATIONS OF THE BIDDER

In order to be considered for the project, the successful bidder must demonstrate that they have completed a minimum of five synthetic field projects in comparable size or greater to the project with in the previous five calendar years. The bidder shall also have completed two projects that involve installing a synthetic field and edge drain inside an existing track.

The Owner may make such investigations as it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein.

ARTICLE 7 – OBLIGATIONS OF THE BIDDER

Bidders must satisfy themselves by personal examination at the site of the proposed work, by review of the Drawings and Specifications including Addenda, and by additional means as they may prefer, as to the actual conditions, requirements, and limits of the proposed work, and as to the accuracy of the information and statements herein contained, and the submission of any bid will be accepted by the Owner as satisfactory proof that the bidder has satisfied himself in these respects. The bidder shall not at any time after the submission of a bid dispute or complain of such statements or information, nor, assert that there was any misunderstanding in regard to the nature, or amount of work to be done. The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve the bidder of his obligation to furnish all materials except those materials furnished by the Owner and labor necessary to carry out the provisions of the Contract Documents and to complete the contemplated work for the considerations set forth in his bid, if his bid is accepted.

ARTICLE 8 – INFORMATION SUPPLIED TO BIDDERS

The Contract Documents contain the provisions required for the construction of the project. Information obtained from any officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the Contract.

ARTICLE 9 – TAXES

Materials purchased for permanent installation in the work will be exempt from the Connecticut Sales and Use Tax and each bidder shall take this exemption into account in capitulating his bid for the work.

ARTICLE 10 – BID SECURITY

Each bid must be accompanied by a certified check of the bidder, or a bid bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of 5 percent of the bid. Such checks or bid bonds will be returned to all but the three lowest bidders within five days after the opening of bids, and the remaining checks or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract; or if no award has been made within 90 days after the date of the opening of the bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid. The bid bond of the successful bidder will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned.

ARTICLE 11 – METHOD OF AWARD-LOWEST QUALIFIED BIDDER

If, at the time this Contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the Owner as available to finance the Contract, the Contract will be awarded on the lowest base bid by a responsible bidder, availability of bidder and bidder considered best suited to the Owner's needs in the Owner's opinion. If such bid exceeds such amount, the Owner expressly reserves the right to increase or decrease any class, item, or part of the work, and this reservation includes the omission of any such item, items, class, or part of the work as may be decided by the Owner at unit prices submitted by the bidder, to bring the Contract within available funds; or the Owner may reject all bids. **In determining the lowest qualified bidder the Owner reserves the right to consider either the Base Bid or combination of Add Alternates the Owner has funds to accept. The lowest qualified bidder will not necessarily be the low price, but a series of factors will be weighed to determine the successful bidder.**

The lowest qualified bidder shall supply the names and addresses of major material suppliers and subcontractors when requested to do so by the Owner.

ARTICLE 12 – EXECUTION OF THE AGREEMENT

A Contract in a form to be provided by the Owner will be required to be executed by the successful bidder and the Owner. The party to whom the Contract is awarded will be required to obtain the performance bond and insurance certificates within ten (10) calendar days from the date when the Notice of Award is delivered to the bidder. The Notice of Award shall be accompanied by the necessary Agreement and bond forms. The Contractor shall furnish a performance bond in the amount of 100 percent of the Contract Price, with a corporate surety approved by the Owner, as security for faithful performance of the Contract.

The Bidder, ten (10) days after notification of award shall have three (3) copies of the Performance Bond, Insurance Certificates, Save harmless endorsement and Agreement ready for a contract signing with the Owner at the Owner's place of business, at which time a pre-construction conference shall be held.

ARTICLE 13 – LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the Contract and bonds required within 10 days after he has received notice of the acceptance of his bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal the surety deposited with his bid.

ARTICLE 14 – NOTICE TO PROCEED

The Notice to Proceed shall be issued within ten (10) days of the execution of the Agreement by the Owner.

ARTICLE 15 – TIME OF COMPLETION AND LIQUIDATED DAMAGES

The bidder must agree to commence work on or before the date specified in the written Notice to Proceed from the Owner. **All work shall be completed in 90 days from the construction commencement day which is anticipated to be June 15, 2016. Based on this date the anticipated construction completion date is September 13, 2016.** The bidder must agree also to pay as liquidated damages, the sum of \$1,000.00 for each consecutive calendar day thereafter as hereinafter provided in the Contract and General Conditions.

ARTICLE 16 – ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be given to any individual bidder orally. Every request for such interpretation must be in writing by email addressed to Gabriella DiBlasi, Director of Finance and Management Services for Monroe Public Schools: email: gdiblasi@monroeps.org and, to be given consideration, must be received by ***4 PM on Friday, May 6, 2016***. Any and all interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be either faxed or email with return receipt requested to all prospective bidders (*at the respective addresses furnished for such purposes*), as well as posted to the Town's website. Failure of any bidder to receive any such addenda or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

ARTICLE 17 – ITEMS NOT LISTED IN THE BID

Appurtenant items of work shown on the Drawings or specified or required to complete the work but not listed separately under the list of items in the bid shall be included in the cost of payment under the various applicable bid items of work and no separate payment will be made for such items. It shall be the responsibility of the Contractor to verify any missing or incomplete items.

ARTICLE 18 – BALANCED BIDDING

Minus bidding on any item or items of the Specifications is prohibited. Bids should be made on each separate item of work shown in the bid (Proposal) with reasonable relation to the probable cost of doing the work included in such item and the right is reserved to reject wholly any bid in case any item or items thereof are obviously unbalanced or appear to the Owner to be so unbalanced as to affect or to

be liable to affect adversely any interests of the Owner. The attention of the bidder is called to the fact that unbalancing of bids may adversely affect the Contractor if certain portions of the work are increased or decreased as provided in the Contract Documents.

ARTICLE 19 – PRICES

Bidders shall state the proposed price for the work by which the bids will be compared. This price is to cover all the expenses incidental to the completion of the work in full conformity with the Contract, the Specifications, and the Drawings. The price or prices proposed shall be stated both in words and in figures, and any bid not so stated shall be rejected.

In the event there is a discrepancy between the unit prices and the extended totals, the unit prices shall govern. In the event that there is a discrepancy between the unit prices written in words and the unit prices written in figures, the unit prices written in words shall govern. No bid will be accepted which does not contain a unit or lump sum price for every item contained in the bid form.

ARTICLE 20 – NON-DISCRIMINATION

The Contractor agrees and warrants that in the performance of this contract he will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, sex, mental retardation or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved in any manner prohibited by the laws of the United States or of the State of Connecticut, and further agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission concerning the employment practices and procedures of the Contractor as relate to the provisions of this section.

ARTICLE 21 – EMPLOYMENT OF LABOR

The wages paid to mechanics, laborers or workmen employed upon the work herein contracted to be done shall be at a rate equal to the rate of wages prevailing for the same work in the same trade or occupation in the Monroe area as determined by the labor Commissioner of the State of Connecticut. See Section 31.53 of the General Statutes of the State of Connecticut, Revision of 1955, as amended.

Public Act 79-325 passed by the 1979 Legislature covers exemptions from Section 31.53 of the General Statutes. Under the new exemptions, effective October 1985, the regulations that the prevailing wage must be paid for work performed by contractors and subcontractors in connection with work on public facilities will not apply:

To public work alterations, repair, refinishing projects with total cost of less than \$100,000.

To public works new construction with a total cost of less than \$400,000.

All Bidders are informed that the project is considered a repair project.

All Bidders are advised to inform themselves and to comply with the requirements of Federal, State and local laws governing the employment of labor.

The Contractor shall provide certified payroll sheets to the Owner which include all employees involved with the project for each payroll period during the course of the project.

ARTICLE 22 – LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable federal and state laws and municipal ordinances for the construction, reconstruction, alteration, remodeling, repair or demolition of public works and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

ARTICLE 23 – NON-RESIDENT CONTRACTORS

Connecticut General Statute §12-430(7) requires that:

When a non-resident contractor enters into a contract they must post a 5% cash or guarantee bond for the total amount with the Commissioner of Revenue Services;

or

Any person dealing with a non-resident contractor without first obtaining a certificate of compliance must deduct 5% from the amount payable to the non-resident contractor and submit it to the state.

If the requirements are not met, the general contractor will be liable for all Connecticut taxes imposed.

All questions shall be directed to the State of Connecticut Department of Revenue Services Discovery Unit at 860-541-3280.

SECTION IV

Proposal Forms/Bid Forms

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

BID PROPOSAL FORM

BIDDER'S FULL LEGAL NAME: _____

NAME OF COMPANY BIDDER IS ASSOCIATED WITH: _____

The respondent hereby acknowledges receipt of the Addenda listed below and further acknowledges that the provisions of each Addendum have been included in the preparation of this Bid:

Addendum No. & Date

Acknowledgement Signature

| | |
|--|--|
| | |
| | |
| | |

LUMP SUM BASE BID PRICES:

Refer to Notice to Contractor - Schedule of Value sheets (SP-4 through SP-6) for descriptions of lump sum bid items.

| ITEM | BASE BID ITEM DESCRIPTION (ITEM PRICE IN WORDS – DOLLARS AND CENTS) | ITEM PRICE (IN FIGURES) |
|------|--|----------------------------|
| A | Site Preparation _____ _____ _____ per LS | \$ |
| B | Site Removals _____ _____ _____ per LS | \$ |

| ITEM | BASE BID ITEM DESCRIPTION (ITEM PRICE IN WORDS – DOLLARS AND CENTS) | ITEM PRICE (IN FIGURES) |
|------|--|--|
| C | Earthwork and Grading _____ _____per LS | \$ |
| D | Athletic Field Subsurface Drainage System _____ _____per LS | \$ |
| E | Synthetic Turf and Resilient Polypropylene Shock/Drainage Pad _____per LS | TO BE PROVIDED AFTER RECEIPT OF TURF BIDS |
| F | Running Track Expansion and D-Zones, Complete _____ _____per LS | \$ |
| G | Site Amenities _____ _____per LS | \$ |
| H | Site Electrical Improvements _____ _____per LS | \$ |

BASE PRICE BID

Pursuant to and in full compliance with the solicitation, the undersigned bidder, having visited the site or property if applicable, and having thoroughly examined each and every document comprising the solicitation, including any addenda, hereby offers and agrees as follows:

To provide the products and/or services specified in, and upon the terms and conditions of, the solicitation for the total sum of _____/100 Dollars (write out in words) (\$_____).

SYNTHETIC TURF BID ITEMS NO. A1 THRU A3

Monroe bid the synthetic turf and resilient polypropylene base furnishment, installation and warranty as part of RFP# 2016-3 which is included in the appendix of this document. The Contractor shall include in his bid the price for Synthetic In-Filled Athletic Turf as provided. The Contractor shall not alter the provided price in anyway and shall carry the cost provided as part of their base bid value.

| ITEM NO. | ALTERNATE BID ITEM DESCRIPTION (ITEM PRICE IN WORDS – DOLLARS AND CENTS) | ITEM PRICE (IN FIGURES) |
|-----------------|---|--|
| A 1 | FIELD MAINTENANCE _____ _____per LS | TO BE PROVIDED AFTER RECEIPT OF TURF BIDS |
| A 2 | FURNISH AND INSTALL CENTER FIELD “M” LOGO _____ _____per LS | TO BE PROVIDED AFTER RECEIPT OF TURF BIDS |
| A 3 | FURNISH AND INSTALL END ZONE LETTERING _____ _____per LS | TO BE PROVIDED AFTER RECEIPT OF TURF BIDS |

ALTERNATE BID ITEMS

The undersigned bidder further proposes and agrees that should any or all the following Alternate Proposal Items be selected for inclusion in the contract with the General Contractor, the amount of the Base Price Proposal set forth above shall be adjusted by the amount(s) stated for the accepted Alternate Proposal Item(s). If selected, the Alternate Proposal Items will be selected as funds allow per the prices provided below. All materials and workmanship shall be in strict accordance with the Drawings and Specifications, and shall be "in-place" prices including all overhead and profit.

ALTERNATE BID ITEMS

| ITEM NO. | ALTERNATE PROPOSAL ITEM DESCRIPTION (ITEM PRICE IN WORDS – DOLLARS AND CENTS) | ITEM PRICE (IN FIGURES) |
|----------|--|----------------------------|
| 1 | NEW SCOREBOARD _____ _____per LS | \$ |
| 2 | NEW AUDIO SYSTEM _____ _____per LS | \$ |
| 3 | NEW ATHLETIC FIELD LIGHTING SYSTEM _____ _____per LS | \$ |
| 4 | NEW CONDUIT FROM CONCESSIONS TO MAIN BUILDING _____ _____per LS | \$ |
| 5 | BALL SAFETY NETTING AND POSTS IN D-ZONES _____ _____per LS | \$ |

UNIT PRICES

The undersigned agrees that the following supplemental Unit Prices shall be the basis of compensation for the addition in the Work. These Unit Prices shall include all overhead and profit. (Note: Bidder shall fill in).

| | <u>UNIT PRICES</u> | <u>Unit</u> | <u>Price per Unit</u> |
|----|---|--------------------|------------------------------|
| 1. | Rock Excavation | per cubic yard | \$ _____ |
| 2. | Installation of 4" PVC Electrical Conduit | per linear foot | \$ _____ |
| 3. | Removal and Replacement of Bituminous Pavement | per square foot | \$ _____ |

ACKNOWLEDGEMENT

In submitting this Bid Proposal Form, the undersigned proposer acknowledges that the price(s) include all labor, materials, transportation, hauling, overhead, fees and insurances, bonds or letters of credit, profit, security, permits and licenses, and all other costs to cover the completed work called for in the solicitation. Except as otherwise expressly stated in the solicitation, no additional payment of any kind will be made for work accomplished under the price(s) as proposed.

REQUIRED DISCLOSURES

1. Exceptions to the solicitation

_____ This bid does not take exception to any requirement of the solicitation, including but not only any of the items included in the Standard Instructions to Bidders.

OR

_____ This bid takes exception(s) to certain of the solicitation requirements. **Attached is a sheet fully describing each such exception.**

2. State Debarment List

Is the proposer on the State of Connecticut's Debarment List?

_____ Yes
_____ No

3. Occupational Safety and Health Law Violations

Has the bidder or any firm, corporation, partnership or association in which it has an interest (1) been cited for three (3) or more willful or serious violations of any occupational safety and health act or of any standard, order or regulation promulgated pursuant to such act, during the three-year period preceding the bid (provided such violations were cited in accordance with the provisions of any state occupational safety and health act or the Occupational Safety and Health Act of 1970, and not abated within the time fixed by the citation and such citation has not been set aside following appeal to the appropriate agency or court having jurisdiction) or (2) received one or more criminal convictions related to the injury or death of any employee in the three-year period preceding the bid?

_____ Yes
_____ No

If "yes," attach a sheet fully describing each such matter.

4. Arbitration/Litigation

Has either the bidder or any of its principals (regardless of place of employment) been involved for the most recent ten (10) years in any resolved or pending arbitration or litigation?

_____ Yes
_____ No

If "yes," attach a sheet fully describing each such matter.

5. Criminal Proceedings

Has the bidder or any of its principals (regardless of place of employment) ever been the subject of any criminal proceedings?

_____ Yes
_____ No

If "yes," attach a sheet fully describing each such matter.

6. Ethics and Offenses in Public Projects or Contracts

Has either the bidder or any of its principals (regardless of place of employment) ever been found to have violated any state or local ethics law, regulation, ordinance, code, policy or standard, or to have committed any other offense arising out of the submission of proposals or bids or the performance of work on public works projects or contracts?

_____ Yes
_____ No

If "yes," attach a sheet fully describing each such matter.

PROPOSAL (BID) SECURITY

I/we have included herein the required certified check or proposal (bid) bond in the amount of 5% of the base proposal amount.

NOTE: THIS DOCUMENT, IN ORDER TO BE CONSIDERED A VALID PROPOSAL, MUST BE SIGNED BY A PRINCIPAL OFFICER OR OWNER OF THE BUSINESS ENTITY THAT IS SUBMITTING THE BID. SUCH SIGNATURE CONSTITUTES THE BIDDER'S REPRESENTATIONS THAT IT HAS READ, UNDERSTOOD AND FULLY ACCEPTED EACH AND EVERY PROVISION OF EACH DOCUMENT COMPROMISING THE SOLICITATION, UNLESS AN EXCEPTION IS DESCRIBED ABOVE.

BY: _____
(PRINT NAME)

TITLE: _____

(SIGNATURE)

DATE: _____

END OF BID PROPOSAL

5660-02-a2516-specs-09-bid proposal form

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

BIDDER'S NON COLLUSION AFFIDAVIT

BID FOR: TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

The undersigned bidder, having fully informed himself/herself/itself regarding the accuracy of the statements made herein, certifies that:

- (1) the bid is genuine; it is not a collusive or sham proposal;
- (2) the bidder developed the proposal independently and submitted it without collusion with, and without any agreement, understanding, communication or planned common course of action with, any other person or entity designed to limit independent competition;
- (3) the bidder, its employees and agents have not communicated the contents of the bid to any person not an employee or agent of the bidder and will not communicate the bid to any such person prior to the official opening of the bid; and
- (4) no elected or appointed official or other officer or employee of the Town of Monroe is directly or indirectly interested in the bidder's proposal, or in the supplies, materials, equipment, work or labor to which it relates, or in any of the profits thereof.

The undersigned bidder further certifies that this affidavit is executed for the purpose of inducing the Town of Monroe to consider its bid and make an award in accordance therewith.

Legal Name of Bidder

(signature)

Bidder's Representative, Duly Authorized

Name of Bidder's Authorized Representative

Title of Bidder's Authorized Representative

Date

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

Notary Public

My Commission Expires: _____

5660-02-a2516-specs-10-non collusion affidavit

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

BIDDER'S STATEMENT OF REFERENCES

Provide at least five (5) references from other synthetic field projects completed within the last five years:

1. BUSINESS NAME: _____
ADDRESS: _____
CITY, STATE: _____
TELEPHONE: _____
INDIVIDUAL CONTACT NAME AND POSITION: _____

2. BUSINESS NAME: _____
ADDRESS: _____
CITY, STATE: _____
TELEPHONE: _____
INDIVIDUAL CONTACT NAME AND POSITION: _____

3. BUSINESS NAME: _____
ADDRESS: _____
CITY, STATE: _____
TELEPHONE: _____
INDIVIDUAL CONTACT NAME AND POSITION: _____

4. BUSINESS NAME: _____
ADDRESS: _____
CITY, STATE: _____
TELEPHONE: _____
INDIVIDUAL CONTACT NAME AND POSITION: _____

5. BUSINESS NAME: _____
ADDRESS: _____
CITY, STATE: _____
TELEPHONE: _____
INDIVIDUAL CONTACT NAME AND POSITION: _____

END OF STATEMENT OF REFERENCES

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, _____ PRINCIPAL,

and _____

as SURETY are held and firmly bound unto the _____ hereinafter called the (OWNER), in the penal sum of Five Percent of Total Bid Dollars, (5% of Total Bid) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these Presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the

Accompanying Bid, dated, _____, _____, for

NOW, THEREFORE, if the Principal shall not withdraw said Bid within the period specified therein after the opening of the same, or, if no period be specified, within ninety (90) days after the said opening, and shall within the period specified therefore, or if no period be specified, within ten (10) days after the prescribed forms are presented to him for signature, enter into a written Contract with the Owner in accordance with the Bid, as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract, or in the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, the Principal shall pay the Owner the difference between the amount specified in said Bid and Amount for which the Owner may procure the required work or supplies or both, if the latter be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals this ____ day of May ____, 2016, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body. In presence of:

(Individual Principal)

(SEAL)

(Partnership)

(Business Address)

(SEAL)

(Business Address)

Attest:

By: _____

(Corporate Principal)

(Business Address)

By: _____
Affix
Corporate
Seal

Attest:

(Corporate Surety)

By: _____
Affix
Corporate
Seal

Countersigned

By _____

Attorney-in-Fact, State of _____

(Power-of-Attorney for person signing for surety company must be attached to bond.)

5660-02-a2516-specs-12-bid bond

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ a _____
(Corporation, Partnership, Individual)
hereinafter called "Principal," and _____, of _____,
State of _____, hereinafter called the "Surety," are
held firmly bound unto the Town of Monroe, Connecticut, hereinafter called the "Town," in the penal
sum of _____ DOLLARS (\$ _____) in
lawful money of the United States, for the payment of which sum well and truly to be made, we bind
ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these
presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, Principal entered into a certain Contract with the Town, dated the ____ day of
_____, 20___, a copy of which is hereto attached and made a part hereof for the
construction of:

NOW, THEREFORE, if the Principal shall well, truly, and faithfully perform its duties, all the
undertakings, covenants, terms, conditions, and agreements of said Contract during the original term
thereof, and any extensions thereof which may be granted by the Town, with or without notice to the
Surety, and if he shall satisfy all claims and demands incurred under such Contract, and shall fully
indemnify and save harmless the Town from all costs and damages which it may suffer by reason of
failure to do so, and shall reimburse and repay the Town all outlay and expense which the Town may
incur in making good any default, then this obligation shall be void; otherwise to remain in full force
and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees
that no change, extension of time, alteration, or addition to the terms of the Contract or to the work

to be performed hereunder of the Specifications accompanying the same shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to work of the Specifications.

PROVIDED, FURTHER, that no right of action shall accrue under this bond to or for the use of a person other than the Obligee and its successors and assigns.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20 _____ .

ATTEST:

(Principal)

(Principal) Secretary
(SEAL)

BY: _____ (s)

(Address - Zip Code)

(Witness as to Principal)

(Address - Zip Code)

(Surety)

ATTEST:

(Surety) Secretary
(SEAL)

BY: _____
(Attorney-in-fact)

(Witness as to Surety)

(Address - Zip Code)

(Address - Zip Code)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all Partners should execute Bond.

5660-02-a2516-specs-13 - performance bond

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

CONTRACT

THIS AGREEMENT, made this *(date)* day of *(month)*, *(year)* by and between the Town of Monroe, Connecticut, herein called the "Owner", acting herein through its First Selectman, Mr. Stephen J. Vavrek., and *(Contractor)* of *(Town)*, *(County)* and State of *(State)*, hereinafter called the "Contractor".

WITNESSETH: That for and in consideration the payments and agreements hereinafter mentioned, to be made and performed by the OWNER and the CONTRACTOR hereby agrees with the OWNER to perform the Track and Field Improvements at Masuk High School in Monroe, CT, hereafter called the Project, for () *(written out)* included on the Contractor's Bid Form which is attached to this document.

Furthermore, all work in connection therewith, under the terms as stated in this contract; and at his (its or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance and other accessories and services necessary to complete the said project in accordance with the Project Manual as well as the construction plans as prepared by the Town.

This agreement shall be enforceable under the laws of the State of Connecticut.

The parties further agree to be contractually bound to submit themselves to the personal jurisdiction of the courts of Connecticut.

The venue for any court proceeding shall be in the Fairfield Judicial District in Bridgeport, Connecticut.

The failure of any party to insist in any one or more instances upon performance of any of the terms or conditions of this Agreement shall not be construed as a waiver or a relinquishment of any right granted hereunder or of the future performance of any such term, covenant, or condition; but the obligations of the parties with respect thereto shall continue in full force and effect.

This Agreement cannot be changed, modified or amended in any respect except by a written instrument signed by the parties hereto. Parties acknowledge and agree that all understandings and agreements heretofore made between the parties are merged in this agreement.

This instrument contains the entire agreement of the parties. It may not be changed orally, but only by an agreement in writing signed by the party against whom enforcement of any waiver, change, modification, extension or discharge is sought.

This agreement may not be assigned by any party hereto without the written consent of the other party.

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the contract. The terms for the payment to the contractor are covered in the Project Manual.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in the year and day first above mentioned.

TOWN OF MONROE

CONTRACTOR

BY: _____
Stephen J. Vavrek

BY: _____
Authorized Representative

TITLE: First Selectman

TITLE: _____

NOTARY PUBLIC CERTIFICATION

Town of Monroe

On this the ____ day of _____, 2016 before me, _____, the undersigned officer, personally appeared _____, known to me (or satisfactorily proven) to be the person whose name is subscribed to in this instrument and acknowledges that they executed the same for the purposes therein contained.

In witness whereof I hereunto set my hand.

Notary Public _____ (Signature)

_____ (Print) Name)

Commission expires _____

Contractor

On this the ____ day of _____, 2016 before me, _____, the undersigned officer, personally appeared _____, known to me (or satisfactorily proven) to be the person whose name is subscribed to in this instrument and acknowledges that they executed the same for the purposes therein contained.

In witness whereof I hereunto set my hand.

Notary Public _____ (Signature)
_____ (Print) Name)
Commission expires _____

SAMPLE

5660-02-a2516-specs-14-contract

SECTION V

General Conditions

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

GENERAL CONDITIONS

INDEX TO GENERAL CONDITIONS

1. Contract and Contract Documents
2. Definitions
3. Representatives of the Contractor
4. Contract Security
5. Contractor's Obligations
6. Superintendence by the Contractor
7. Construction Schedule and Periodic Estimates
8. Use of Premises and Removal of Debris
9. General Guarantee
10. Protection of Work and Property - Emergency
11. Weather Conditions
12. The Owner's Authority
13. All Work Subject to Control by the Owner
14. The Owner's Control Not Limited
15. Right of the Owner to Terminate the Contract
16. Interpretation of the drawings and specifications
17. Inspection
18. Reports, Records and Data
19. Subcontractors
20. Assignments
21. Mutual Responsibility of Contractors
22. Separate Contracts
23. Safety and Health Regulations
24. Shop Drawings
25. Additional Instructions and Detail Drawings
26. Materials, Services and Facilities
27. Contractor's Title to Materials
28. Inspection and Testing of Materials
29. Patents
30. Contractor's Bond and Insurance
31. Indemnity of Town by Contractor
32. Termination for Convenience
33. Competent Help to be Employed
34. Spirituous Liquors and Drugs
35. Claims for Extra Work

36. Work Changes
37. Owner's Right to do Work
38. Payments
39. Payment to Sub-Contractors
40. Work in Inclement Weather
41. Power & Water
42. Toilet Accommodations
43. Liens
44. Final Inspection and Acceptance
45. Final Payment

ARTICLE 1 CONTRACT AND CONTRACT DOCUMENTS

The drawings, plans, specifications, and addenda enumerated in Article 1 of the General Conditions, Special Conditions, the Notice of Bid, the Information to Bidders, and the Bid Proposal as accepted by the OWNER, shall be binding upon the parties to this Agreement as if fully set forth therein. Whenever the term Contract Documents is used it shall mean and include the drawings, specifications and addenda. The OWNER shall interpret their own requirements. In case of conflict or inconsistency between the provisions of the signed portions of the Contract Documents and those of the specifications, the provisions of the signed portions shall govern.

ARTICLE 2 DEFINITIONS

The following terms as used in this contract are defined as follows:

- A. Owner - The Owner of the project is the Town of Monroe, Connecticut,
- B. Contractor - The term "Contractor" as hereinafter used shall refer to the General Contractor for this job.
- C. Owner's Representative - The term "Owner's Representative" as hereinafter used shall refer to the Engineer of the Town of Monroe, Connecticut who is appointed by the School to supervise the work and shall extend to and include any engineer or inspector whom the owner may designate to inspect, test or oversee the work herein specified.
- D. School - whenever this term is used in these General Conditions, "School" shall mean Town of Monroe Board of Education.
- E. Town - Wherever the term "Town" is used in these General Conditions, it shall mean the Town of Monroe, Connecticut.
- F. Contract/Contract Documents - Wherever the term "contract" or "contract documents" is used in this project manual, it shall mean the actual bid form, specifications, Plans, General Conditions, Special Conditions, addenda, information to Bidders, agreement and formal purchase order issued to successful bidder.

The rights and obligations of the CONTRACTOR under this contract shall include, but not be limited to the following:

ARTICLE 3 REPRESENTATIONS OF THE CONTRACTOR

The Contractor represents and warrants:

- a. That the contractors financially solvent and that the contractor is experienced and competent to perform the type of work required under this contract and that the contractor is able to furnish the plant, materials, supplies, or equipment that may be necessary to perform the work as specified.

- b. That the contractor is familiar with all Federal, State and municipal laws, ordinances, orders, and regulations which may in any way effect the project work, or the employment of persons thereon, including but not limited to any special acts relating to the work or to the project of which it is a part.
- c. That such temporary and permanent work required by the contract documents to be done by him will be satisfactorily constructed and can be used for the purpose for which it was intended and that such construction will not injure any person or damage property.
- d. That the contractor has carefully examined the drawings, specifications, and addenda, if any, and the site of the work and that from his own investigations, the contractor has satisfied himself as to the nature and location of the work, the character of equipment and other facilities needed for the performance of the work, the general and local conditions, and all other items that may affect the work.
- e. That the contractor is aware of the hazards involved in the work and the danger to life and property both evident and inherent and that the contractor will conduct the work in a careful and safe manner without injury to persons or property.

ARTICLE 4 CONTRACT SECURITY

The Contractor shall furnish a Performance Bond in amounts equal to at least one hundred percent (100%) of the contract price as security for the faithful performance of the Contract, and for the payment of all persons performing labor on the project under this contract and furnishing materials, equipment and all other incidentals in connection with this contract. The Surety on such a bond shall be a duly authorized surety company satisfactory to the Owner and the cost of the same shall be paid by the Contractor. Prior to the starting of any work, the bonds must be approved by the Owner and be in the Owner's hands.

ARTICLE 5 CONTRACTOR'S OBLIGATIONS

The Contractor shall perform all work in a good workmanlike manner, and in accordance with the plans and specifications and any supplements thereto, and according to any directions or orders given by the Owner unless otherwise stipulated. The contractor shall furnish all supplies, materials, except those supplies and materials furnished by the Owner, facilities, equipment, tools and anything else necessary or proper to perform and complete the work required by this contract. The contractor shall furnish, erect, maintain, and remove any construction plant or temporary work as may be required. The contractor alone shall be responsible for the safety, efficiency-, and adequacy of his plant, appliances, and methods and for any damage which may result from their failure or their improper construction maintenance, or operation. The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the contract and specifications and shall do, carry on, and complete the entire work to the satisfaction of the Owner.

The Contractor shall be solely responsible for all the work and shall provide all precautionary measures necessary for preventing injury to persons or damage to property. All injury or damage of whatever

nature resulting from the work or resulting to persons, property, or the work during its progress, from whatever cause, shall be the responsibility of the Contractor.

The Contractor shall hold the Owner and Engineer, or their duly authorized agents, harmless and defend and indemnify them against damages or claims for damages due to injuries to persons or property arising out of the execution of the project work, and for damages to materials furnished for the work, for infringement of inventions, patents, and patent rights used in doing the work, and for any act, omission, or instance of neglect by the Contractor, their agents, employees, or subcontractors.

The Contractor shall bear all losses resulting to them, including but not limited to losses sustained on account of the character, quality, or quantity of any part of the work, or all parts of the work, or because the nature of the conditions in or on the project site are different from what was estimated or indicted, or on account of the weather, elements, or other causes.

ARTICLE 6 SUPERINTENDENCE BY THE CONTRACTOR

The Contractor shall give the work the constant attention necessary to facilitate the progress thereof and shall cooperate with the Owner in every possible way.

At the site of the work, the Contractor shall, at all times, employ a suitably experienced construction Representative who shall have full authority to act for the Contractor. It is understood that the employment of such representative shall be acceptable to the Owner and shall be such a person as can be continued in the capacity for the duration of the contract, unless The person ceases to be on the Contractor's payroll.

ARTICLE 7 CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

Within five (5) days after the date of "Notice to Proceed" the Contractor shall deliver to the Owner an estimated construction progress schedule in a form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish the Owner: 1. a detailed estimate, giving a complete breakdown (schedule of values) of the contract price; and 2. periodic itemized estimates of the work done for the purpose of making partial payments thereon.

ARTICLE 8 USE OF PREMISES AND REMOVAL OF DEBRIS

The Contractor undertakes, at his own expense:

- a. To take every precaution against injuries to persons or damage to property.
- b. To store his apparatus, materials, equipment, and supplies in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or any others.
- c. To place upon the work or any part thereof, only such loads as are consistent with the safety of that portion of the work.

- d. To clean frequently all refuse, scrap, and debris caused by his operations, and to dispose of same away from the site, so that the work site is maintained in a neat, workmanlike appearance.
- e. To effect all cutting, fitting, or patching of his work required to make the same conform to the drawings and specifications, and except with the consent of the Owner, not to cut or otherwise alter the work of any other contractor.
- f. Before final payment, to remove all surplus materials false work, temporary structures, including foundations thereof, plants of any description, and debris of any nature resulting from his operations and to dispose of same away from the site, so that the site is left in a neat, orderly, and workmanlike condition.

ARTICLE 9 GENERAL GUARANTEE

Neither the final certificate of payment nor any provision in the contract documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the contract documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty workmanship or materials.

The Contractor shall remedy any defects in the work and pay for any damage to other work resulting there from, which shall appear within a period of one year (1) from the date of final acceptance of the work, unless a longer period is specified by the Owner. The Owner will give final notice of observed defects with reasonable promptness.

ARTICLE 10 PROTECTION OF WORK AND PROPERTY - EMERGENCY

- a. The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. The contractor shall at all times safely guard and protect his own work, and that of adjacent property, from damage. The Contractor shall replace or make good any such damage, loss, or injury at no additional expense to the Owner.
- b. In case of an emergency which threatens loss or injury of property, and/or safety of life the Contractor will be allowed to act, without previous instructions from the Owner, in a diligent manner. The contractor shall notify the Owner immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Owner for approval.
- c. Where the Contractor has not taken action but has notified the Owner of an emergency threatening injury to persons or damage to the work or to any adjoining property, contractor shall act as instructed or authorized by the Owner.
- d. The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided elsewhere in the contract documents.

ARTICLE 11 WEATHER CONDITIONS

In the event of temporary suspension of the work or during inclement weather, or whenever the Owner shall direct, the Contractor shall, and shall cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Owner, any work or materials are damaged or injured by reason of failure to protect them on the part of the Contractor, or any of his subcontractors, or otherwise damaged or injured by the Contractor's negligence, or are found to be defective, such materials or work shall be removed and replaced at the expense of the Contractor.

ARTICLE 12 THE OWNER'S AUTHORITY

In case any question shall arise between the parties hereto relative to said contract or specifications, the determination or decision of the Owner shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected by such questions. The Owner shall decide 'the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found to be obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor and other contractors performing work for the Owner, shall be adjusted and determined by the Owner.

ARTICLE 13 ALL WORK SUBJECT TO CONTROL BY THE OWNER

- a. In the performance of the work, the Contractor shall abide by all orders, directions, and requirements of the Owner, and shall perform all work to the satisfaction of the Owner, and at such times and places, by such methods, and in such manner and sequence as the owner may require. The Owner shall interpret the drawings, specifications, contract documents, all other documents, and the extra work orders. The Owner shall also decide all other questions in connection with the work. The Contractor shall employ no plant, equipment, materials, methods or men to which the Owner objects and shall remove no plant, materials, or equipment or other facilities from the work site without the Owner's permission. Upon request the Owner will confirm in writing any oral order, direction, requirement, or determination.
- b. Inspectors shall be authorized to inspect all work done and materials furnished. Such inspection may extend to all parts of the work and to the preparation or manufacture of the materials to be used. The presence or absence of an inspector shall not relieve the Contractor from any requirements of the contract. In case of any dispute arising between the Contractor and the inspector as to materials furnished or the manner in which the work is being executed, the inspector shall have the authority to reject material or suspend work until the question has been decided by the Owner. The inspector shall in no case act as foreman or perform other duties for the Contractor, or interfere with the management of the work by the latter. Any advice which the inspector may give the Contractor shall in no way be construed as binding the Owner, or the Engineers in any way, nor releasing the Contractor from the fulfillment of the terms of the contract.

ARTICLE 14 THE OWNER'S CONTROL NOT LIMITED

The enumeration in this contract of particular instances in which the opinion, judgment, discretion, or determination of the Owner shall control or in which work shall be performed to his satisfaction or subject to his approval or inspection, shall not imply that only matters similar to those enumerated shall be so governed and performed, but without exception all the work shall be so governed and performed.

ARTICLE 15 RIGHT OF THE OWNER TO TERMINATE THE CONTRACT

In the event that any of the provisions of this contract are violated by the Contractor, or any of his subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate the contract, such notice to contain the reasons for such intention to terminate the contract. If within ten days (10) such violation or delay shall not cease and satisfactory arrangement of correction made, the contract shall, at the expiration of the ten days, cease and immediately serve notice thereof upon the Surety and the Contractor, and the Surety shall have the power to take over and perform the contract, provided, however, that if the Surety does not commence performing thereof within ten days (10) from the date of mailing to such Surety of Notice of termination, the Owner may take over the work and prosecute the same to completion by contract or force account at the expense of the Contractor, and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby.

ARTICLE 16 INTERPRETATION OF THE DRAWINGS AND SPECIFICATIONS

Except for the Contractor's executed set, all drawings and specifications are the property of the Owner. The Owner will furnish the Contractor, without charge, three (3) sets of the drawings and specifications. Additional sets will be furnished upon request, at actual cost of reproduction.

The Contractor shall keep one (1) copy of the drawings and specifications at the work site at all times and shall give the Owner and their representative's access thereto. Anything on the drawings and not mentioned in the specifications, or anything in the specifications that is not shown on the drawings shall have the same force and effect as if mentioned in both. In case of conflict or inconsistency between the drawings and the specifications, the specifications shall take precedence. Any discrepancy in the figures and the drawings shall be immediately submitted to the Owner for decision and the decision of the Owner shall be final. In case of differences between small and large scale drawings, the larger scale drawings shall take precedence .

ARTICLE 17 INSPECTION

The authorized representatives and agents of the Owner shall be permitted to inspect all work materials, payrolls, records of personnel, invoices for materials, and other relevant data and records.

ARTICLE 18 REPORTS, RECORDS AND DATA

The Contractor and each of his subcontractors, shall submit to the Owner such schedules of quantities, and costs, progress schedules, payrolls, reports, estimates, records, and other data as the Owner may request concerning the work Performed or to be performed under this contract.

ARTICLE 19 SUBCONTRACTORS

The Contractors may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.

The Contractor shall not award work to any subcontractor other than those listed in his bid, without the prior written approval of the Owner, which approval will not be given until the Contractor submits a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Owner may require.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work, to bind the subcontractors to the contract documents insofar as applicable to the subcontract work and to give the Contractor under any provisions of the contract documents.

Nothing contained in this contract shall create any contractual relationship between the Owner and any subcontractor.

ARTICLE 20 ASSIGNMENTS

The Contractor shall not assign the whole or any part of this contract or any monies due or to become due hereunder without the written consent of the Owner. In case the Contractor assigns all or part of any monies due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior claims of all persons, firms, or corporations for services rendered or materials supplied for the performance of the work called for in this contract.

ARTICLE 21 MUTUAL RESPONSIBILITY OF CONTRACTORS

If, through acts of neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage to the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration. If such other contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor who shall indemnify and save harmless the Owner against any such claim.

ARTICLE 22 SEPARATE CONTRACTS

The Owner reserves the right to let other contracts in connection with the construction of the contemplated work of the project, or contiguous projects of the Owner. The Contractor, therefore, will afford to any such other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, will properly connect and coordinate his work with theirs, and will not commit or permit any act which will interfere with the performance of their work.

The Contractor shall coordinate his operations with those of other contractors. Cooperation will be required in the arrangement for storage of materials and in the detailed execution of the work. Failure by the Contractor to keep informed on the progress of the work, or failure to give notice of the lack of

progress or defective workmanship by others, shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with and performance of his own work.

ARTICLE 23 SAFETY AND HEALTH REGULATIONS

These contract documents, and the joint and several phases of construction hereby contemplated, are to be governed, at all times, by the applicable provisions of the Federal law(s) including but not limited to the following:

- a. Williams-Steiger Occupational Safety and Health Act, 1970, Public Law 92-596;
- b. Part 1910 of the Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.
- c. This project is subject to all of the Safety and Health Regulations (CFR 29, Part 1926 and all subsequent amendments) as promulgated by the U.S. Department of Labor on June 24, 1974. Contractors are urged to become familiar with the requirements of these regulations.

In the event of any inconsistencies between the above laws and regulations and the provisions of these contract documents, the laws and regulations shall prevail.

ARTICLE 24 SHOP DRAWINGS

- a. The Contractor shall submit promptly to the Owner three (3) copies or a digital copy of each shop drawing prepared in accordance with a schedule predetermined by the Contractor. After examination of such drawings by the Owner, and the return thereof, if resubmission is required the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Owner with three (3) corrected copies or a digital copy. Regardless of corrections made in or approval given to such drawings by the Owner, the Contractor will, nevertheless, be responsible for the accuracy of such drawings and for their conformity to the drawings and specifications, unless the contractor notifies the Owner in writing of any deviations at the time he furnishes the drawings.
- b. Shop drawings of all fabricated work shall be submitted to the Owner for approval and no work shall be fabricated by the Contractor save at his own risk until approval has been given by the Owner.
- c. The Contractor shall submit all shop drawings on dates sufficiently in advance of requirements to enable the Owner ample time for reviewing the same, including time for correcting, resubmission and reviewing if necessary, and no claim for delay will be granted the Contractor by reason of his failure in this respect.
- d. All shop drawings submitted must bear the stamp of the Contractor as evidence that the drawings have been checked by him. Any drawings submitted without this stamp of approval will not be considered and will be returned to the Contractor for resubmissions. If the shop drawings show deviations from the requirements of the contract documents

because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal to the Owner, in order that if acceptable, suitable action may be taken for proper adjustment; otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with the contract documents even though the shop drawings have been approved.

- e. Where shop drawings are submitted by the Contractor that indicate a departure from the contract which the Owner deems to be a minor adjustment in his interest and not involving a change in the contract price or extension of time, the Owner may approve the drawings but the approval will contain in substance, the following:

"The modification shown on the attached drawings is approved in the interest of the Owner to effect an improvement for the project and is ordered with the understanding that it does not involve any change in the contract price or an extension of time; that it is subject generally to all contract stipulations and covenants; and that it is without prejudice to any rights of the Owner under the contract and bond or bonds."

- f. The approval of the shop drawings will be general and shall not relieve the Contractor from the responsibility for adherence to the contract, nor shall it relieve him of the responsibility for any error which may exist.
- g. The Contractor agrees to hold the Engineer and the Owner harmless and defend them against damages or claims for damages arising out of injury to others or property of third persons which result from errors on shop, working, or setting drawings whether or not they have been approved by the Engineer and/or the Owner.

ARTICLE 25 ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the contract documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Owner will prepare jointly a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing, and installation of materials, supplies, and equipment, and the completion of the various parts of the work; each schedule to be subject to change from time to time in accordance with the progress of the work.

ARTICLE 26 MATERIALS, SERVICES AND FACILITIES

It is understood that, except as otherwise specifically stated in the contract documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever, necessary to protect, execute, complete, and deliver the work within the specified time.

It may be necessary for some work to be performed after regular hours, on Saturdays, Sundays, or legal holidays as designated by the Owner. Any work necessary to be performed after regular hours, on Saturdays, Sundays, or legal holidays shall be performed by the Contractor without additional expense to the Owner and at the Owner's advanced approval.

ARTICLE 27 CONTRACTOR'S TITLE TO MATERIALS

No material, supplies, or equipment for the work shall be purchased by the Contractor or any subcontractor, subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the work and further warrants upon completion of all work, to deliver the premises, together with all improvements and appurtenances constructed or placed thereon by him, to the Owner free from any claims, liens, or charges, or encumbrances and further agrees that neither he nor any person, firm, or corporation furnishing any material or labor for any work covered by this contract shall have the right to a lien upon the premises or any improvement or appurtenance thereon.

ARTICLE 28 INSPECTION AND TESTING OF MATERIALS

All materials and equipment used in the construction of the project shall be new and of current manufacture. Testing will be done in accordance with accepted standards and as directed by the Owner; the laboratory or inspection agency shall be selected by the Owner. Except as specified elsewhere in these specifications. The Owner will pay for laboratory inspection.

All materials and workmanship shall be subject to inspection, examination, and testing by the Owner at any and all times during manufacture and/or construction and at any and all places where such manufacture and or construction is carried on, to establish conformance with these specifications and suitability for uses intended. Without additional charge the Contractor shall furnish promptly all reasonable facilities, labor, and materials necessary to make tests so required safe and convenient; he shall also furnish any mill, factory, or other such tests based on the Standards and Tentative Standards of the American Society for Testing Materials as required by the Owner.

ARTICLE 29 PATENTS

- a. The Contractor shall hold and save the Owner harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the- contract, including its use by the Owner.
- b. License and/or royalty fees for the use of a process which is authorized by the Owner must be reasonable, and paid to the holder of the patent, or his authorized agent, directly by the Contractor.
- c. If the Contractor uses any design, device, or material covered by letters, patent, or copyright, he shall provide for such use by suitable agreement with the owner of such patent or copyrighted design, device, or material.

- d. It is mutually agreed and understood that, without exception, the contract prices shall include all royalties, license fees or costs arising out of the use of such process, design, device or materials in any way involved in the work. The Contractor and/or his Surety shall indemnify and save the Engineer and the Owner harmless from all claims for infringement by reason of use of such patented material, device or design, in connection with the work under this contract, and shall indemnify the Engineer and the Owner for any cost, expense or damage which it may be obligated to pay for reason of such infringement at any time during the prosecution of the work.

ARTICLE 30 CONTRACTOR'S INSURANCE

The Contractor, at their expense, will provide, carry and maintain throughout the term of this contract, adequate insurance as requested by the Board that will protect the Contractor, the Board of Education and the Town of Monroe, its officers, employees and volunteers from any and all claims for loss, damage, injury or death which may arise from the operation of this contract by the Contractor or anyone directly or indirectly employed by them. Policies shall be so written that the Town of Monroe will be notified of cancellation at least thirty (30) days prior to the effective date of such cancellation. Certificates showing that all of the Contractor's operations are covered, and stating the coverage with the Town included as an additional insured, the limits of liability, expiration dates and exclusions, if any, will be filed with the Town of Monroe before the term of the contract commences.

The Contractor shall provide the Town with certification by a properly qualified representative of the insurer that the Contractor's insurance complies with this section.

All of the insurance policies required shall have the legal company name of the insurer providing coverage, and contain the current rating of the insurer as provided by "Best's Insurance Reports", which must be A-, VII or above. This obligation applies to coverage written on an occurrence as well as a "claims-made" basis.

The Insurance Certificate must state whether coverage is written on an "occurrence" basis or a "claims-made" basis. All insurance must maintain that the Town is an "additional insured" for General Liability and Umbrella policies, and any other coverage as the Town may require for specific projects. Such insurance must be issued by insurance companies licensed to write such insurance in the State of Connecticut.

The Town of Monroe, its officers, officials, employees and volunteers are to be covered as insured as respects liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied, or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Town, its officers, officials, employees, or volunteers.

The Contractor's insurance coverage shall be primary insurance as respects the Town, its officials, employees and volunteers. Any insurance or self-insurance maintained by the Town, its officers, officials, employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

Section A. Worker's Compensation and Employer's Liability

Worker's Compensation must be provided in accordance with the Worker's Compensation Laws of Connecticut. Should a Contractor be involved in operations requiring coverage under special State or Federal Acts, such as Maritime or Railroad, the Contractor must provide evidence of this coverage. Should a Contractor be exempt from the Worker's Compensation Laws of the State of Connecticut, or any other State or Federal requirements, evidence of such exemption must be provided to the Town and a "Hold-Harmless" agreement provided in language satisfactory to the Town holding it harmless in the event of any claim for injury or damages. Contractors based out-of-state must provide evidence that their Worker's Compensation policy will cover injuries/illnesses sustained while working in the State of Connecticut.

The Contractor is responsible for ensuring that all of its subcontractors carry Worker's Compensation Insurance, as described above.

Employer's Liability must be provided in accordance with the following limits:

\$500,000 each - Bodily Injury

\$500,000 disease - Policy Limit - Bodily Injury

\$500,000 disease - Each Employee - Bodily Injury

Section B. General Liability

Occurrence Policy Guidelines

General Liability - Written under commercial or comprehensive form including the following: (Premises/Operation, Products/Completed Operations, Contractual, Independent Contractors, Broad Form Property Damage, and Personal Injury)

- | | |
|---|-------------|
| • General Aggregate | \$2,000,000 |
| • Products/Completed Operations Aggregate | \$2,000,000 |
| • Personal & Adv Injury | \$1,000,000 |
| • Each Occurrence | \$1,000,000 |
| • Fire Damage (any one fire) | \$1,000,000 |
| • Medical Expense (any one person) | \$10,000 |

Excess Liability (Umbrella)

- | | |
|-------------------|-------------|
| • Each Occurrence | \$1,000,000 |
| • Aggregate | \$1,000,000 |

The Town requires that these aggregate limits be maintained by the Contractor as required. It is the responsibility of the Contractor or his representative to notify the Town if ever or whenever claims reduce the General Aggregate below \$2,000,000. If the aggregate limits include defense costs the Town should be so notified. It is the responsibility of the Contractor and his insuring agent to provide the Town with current certificates throughout the contract period keeping the required limits in full force and effect. The Town of Monroe reserves the right to modify or change the requirements at any time if it is in the best interest of the Town to do so.

Claims-Made Coverage Guidelines

General Liability - Written under commercial or comprehensive form including the following:

- Premises/Operations
- Products/Completed Operations
- Contractual
- Independent Contractors
- Broad Form Property Damage and Personal Injury

The Town requires that the Certificate of Insurance include the retroactive date of the policy. Retroactive dates must be either before or coincident with the Contract's inception.

The Town requires prompt and immediate notice of the following:

- Erosion of any aggregate limits.
- Advance of any retroactive dates.
- Cancellation or non-renewal. Prior 30 day notice.

The Town requires that any extended reporting period premium be paid by the named insured. The reporting of possible claims to the Town of Monroe is necessary and the Town retains the right to require that the extended reporting period be invoked by the Contractor at his/her expense. The Town requires that if any excess coverage is secured to meet the requirements that the retroactive dates be concurrent with the primary policy and that the retro dates be either before or coincident with the inception of the Contract. If the retroactive date is moved, or if the policy is canceled or not renewed, the Contractor must invoke the tail coverage option, at no expense to the Town but rather at the expense of the Contractor, in order to adequately assure that the policy meets the above requirements.

Liability Limits: Same as those under "Occurrence Policy Guidelines".

Section C. Automobile Liability

Automobile Liability - coverage for commercial or comprehensive automobile liability (vehicular), covering any auto, all owned autos (private passenger), all owned autos (other than private passenger), hired autos and non-owned autos.

- Combined Single Limit – Bodily Injury/Prop Damage \$1,000,000

Insurance under B & C above must provide for a 30-day notice to the Town of Monroe of cancellation, non-renewal, termination, or any restrictive amendment.

ARTICLE 31 INDEMNITY OF TOWN BY CONTRACTOR

To the fullest extent permitted by law, the successful respondent, its subcontractor, agents, servants, officers or employees shall indemnify and hold harmless the Board of Education and the Town of Monroe, Connecticut, including, but not limited to, its respective elected and appointed officials,

officers, employees and agents, from any and all claims brought by any person or entity whatsoever, arising from any act, error, or omission of the provider during the respondent's performance of the Agreement or any other agreements of the respondent entered into by reason thereof. The respondent shall indemnify and defend the Board of Education and the Town of Monroe, Connecticut, including, but not limited to, its respective elected and appointed officials, officers, employees and agents, with respect to any claim arising, or alleged to have arisen from negligence, and/or willful, wanton or reckless acts or omissions of the respondent, its subcontractor, agents, servants, officers, or employees and any and all losses or liabilities resulting from any such claims, including, but not limited to, damage awards, costs and reasonable attorney's fees. This indemnification shall not be affected by any other portions of the Agreement relating to insurance requirements. The respondent agrees that it will procure and keep in force at all times at its own expense, insurance in accordance with these specifications.

ARTICLE 32 TERMINATION FOR CONVENIENCE

The Owner hereby reserves the right to terminate the performance of this contract for any reason the it deems appropriate. The Owner will pay all actual costs to date of termination; however, the Contractor shall not be entitled to any profit on furnished or unearned work.

ARTICLE 33 COMPETENT HELP TO BE EMPLOYED

The Contractor shall employ experienced foreman, craftsmen and other workmen competent in the work in which they are to be engaged. All work shall be accomplished by able, skilled and competent personnel. If any person employed on the work by the Contractor shall appear to be incompetent or unreliable in any way, he shall be discharged immediately upon the request of the Owner and shall not -again be employed on the work.

ARTICLE 34 SPIRITUOUS LIQUORS AND DRUGS

The Contractor shall neither permit nor suffer the introduction or use of -spirituous liquors upon the work embraced in this contract. Dope or drugs of any kind unless ordered by a physician are prohibited. Any employee found using spirituous liquors, dope or drugs of any kind unless ordered by a physician shall be immediately discharged.

ARTICLE 35 CLAIMS FOR EXTRA WORK

After the contract has been signed, no claims for extra work will be honored unless authorized in writing by the Owner.

ARTICLE 36 WORK CHANGES

The Owner may make changes by altering, adding to or deducting from the work, without invalidating the contract, but all such changes must be mutually agreed upon in writing, between the Owner and the Contractor before proceeding with the execution of the work. All such changes in the work shall be authorized on a change order. Charges or credits for work covered by the approved change shall be either (a) an agreed lump sum or (b) actual cost.

ARTICLE 37 OWNER'S RIGHT TO DO WORK

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this contract, the Owner, after five (5) days written notice to the Contractor may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment, then or thereafter due the Contractor.

ARTICLE 38 PAYMENTS

Payment for the work will be made when the work outlined in the specifications is completed or in accordance with the terms stated herein. Invoices shall be prepared in prescribed form by the Contractor and shall be submitted to the Owner's Representative in triplicate for checking and certifications.

No payment or compensation of any kind shall be made to the Contractor for damages because of hindrance or delay from any cause in the progress of work, whether such hindrance or delays be avoidable or unavoidable.

ARTICLE 39 PAYMENT TO SUB-CONTRACTOR

The Owner assumes no obligation to pay to or to see to the payment of any sum to any sub-contractor.

ARTICLE 40 WORK IN INCLEMENT WEATHER

The Owner or the Owner's Representative will determine when conditions are unfavorable for work and may order the work or any portion of it suspended whenever, in his opinion the conditions are not such as will insure first class work. In general, work shall be prosecuted throughout the year and the Contractor will be expected to keep work going and employment of labor as continuous as possible. However, the Contractor shall, and shall cause his subcontractors to protect carefully his and their work against damage or injury from the weather. If this is not done to the Owner's satisfaction and any damage to the work occurs, the work shall be removed and replaced at the expense of the Contractor.

ARTICLE 41 POWER AND WATER

Should the Contractor require electric power and/or water, he shall make necessary arrangements with the Owner for securing it and bear any expense involved, unless expressly provided for otherwise in the specifications.

ARTICLE 42 TOILET ACCOMMODATIONS

The Contractor shall provide necessary sanitary toilet accommodations for the workmen.

ARTICLE 43 LIENS

The final payment for the work will not be made until the Owner is satisfied that no liens have, or can be placed for material or labor on this work. If required by the Owner, waivers of liens may be required. If the Contractor, or any subcontractor refuses to furnish a release or waiver of liens, they may furnish a bond satisfactory to the Owner to indemnify the Owner against any liens.

ARTICLE 44 FINAL INSPECTION AND ACCEPTANCE

Upon receipt of written notice from the Contractor that his work is substantially complete and requesting that the Owner issue a certificate of completion, the Owner's Representative will make a final inspection with the Contractor to determine the status of completion. The Owner's Representative will notify the Contractor in writing of all instances in which the work fails to comply with the specifications as well as any defects which he may discover. The Contractor shall thereupon immediately rebuild, alter and restore the work so that it will comply with the specifications and he shall remedy any defects at his own cost and expense and to the satisfaction of the Owner's Representative. Once the Owner's Representative considers the Work complete, the Owner's Representative will prepare a certificate of Final Completion. The issuance of such certificate of final acceptance by the Owner's Representative shall not prevent the Owner from recovering damages at any subsequent time for work found to be actually defective.

The Owner shall have the right to exclude the Contractor for the Work after the date of Final Completion, but the Owner shall allow the Contractor reasonable access to complete or correct items on the list.

ARTICLE 45 FINAL PAYMENT

The acceptance by the Contractor of payment for the final invoice, made after the Owner's Representative's certification of final acceptance as provided for in these General Conditions, shall release the Town of Monroe and every agent of the Owner and its representatives from all further claims or liabilities to the Contractor of whatever nature, except for the remaining sum or sums of money withheld under the provisions of the contract.

SECTION VI

Special Conditions

**MONROE BOARD OF EDUCATION
TOWN OF MONROE, CONNECTICUT**

REQUEST FOR PROPOSALS #2016-4

TRACK AND FIELD IMPROVEMENTS AT MASUK HIGH SCHOOL

SPECIAL CONDITIONS

INDEX TO SPECIAL CONDITIONS

| ARTICLE | TITLE |
|---------|---|
| 1. | GENERAL |
| 2. | ENUMERATION OF DRAWINGS, SPECIFICATIONS & ADDENDA |
| 3. | CHANGES |
| 4. | PROTECTION OF TREES |
| 5. | HURRICANE PROTECTION |
| 6. | NIGHT WORK |
| 7. | DIFFERING SITE CONDITIONS |
| 8. | SUSPENSION OF WORK |
| 9. | DISPOSAL OF MATERIALS |
| 10. | INTERFERENCE WITH EXISTING STRUCTURES |
| 11. | DEFECTIVE MATERIALS AND TESTING |
| 12. | FINISHING AND CLEANING UP |
| 13. | CLEAN UP AT CONTRACTOR'S EXPENSE |
| 14. | RIGHTS OF ACCESS |
| 15. | EXISTING UTILITIES |
| 16. | DUST CONTROL |
| 17. | WORK BY OTHERS |
| 18. | FAILURE TO REPAIR |
| 19. | CONSTRUCTION LAYOUT |

ARTICLE 1 GENERAL

- (a) The Owner and the Contractor agree that the following special conditions shall apply to the work to be performed under this Contract and that such provisions shall supersede any conflicting provisions of this Contract.
- (b) The rights and remedies of the Owner provided for in these clauses are in addition to any other rights and remedies provided by law and under this Contract.

ARTICLE 2 ENUMERATION OF DRAWINGS, SPECIFICATIONS AND ADDENDA

The following are the Drawings, Specifications, and Addenda which form a part of this Contract, as set forth in Article 1 of the General Conditions of these Contract Documents.

- (a) DRAWINGS:

| <u>NAME</u> | <u>TITLE</u> |
|-------------|---|
| -- | Title Sheet |
| EX | Existing Conditions |
| SR | Site Plan – Removals |
| LA | Site Plan – Layout |
| GR | Site Plan – Grading and Erosion Controls |
| UT | Site Plan - Utilities |
| SD-1 | Sediment and Erosion Control Details and Specifications |
| SD-(2-7) | Site Details |
| E-1 | Site Electrical Plan |
| E-2 | Electrical Notes and Schedule |
| E-3 | Electrical Diagrams and Details |

- (b) GENERAL CONDITIONS
- (c) SPECIAL CONDITIONS
- (d) SPECIAL PROVISIONS
- (e) ADDENDA:

| | |
|-----|--------|
| No. | Dated: |
| No. | Dated: |
| No. | Dated: |

ARTICLE 3 CHANGES

- (a) The Owner may, at any time, without notice to the sureties, by written order designated or indicated to be a Change Order, make any change in the work within the general scope of this Contract, including but not limited to changes:
 - 1. In the Specifications (including drawings and designs)
 - 2. In the method or manner of performance of the work;

3. In the Owner-furnished facilities, equipment, materials, services, or site; or
 4. Directing acceleration in the performance of the work.
- (b) Any other written order or an oral order (which terms as used in this paragraph (b) shall include direction, instruction, interpretation or determination) from the Owner, which causes any such change, shall be treated as a change order under this clause, provided that the Contractor gives the Owner written notice stating the date, circumstances and source of the order and that the Contractor regards the order as a Change Order.
- (c) Except as herein provided, no order, statement, or conduct of the Owner shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment hereunder.
- (d) If any change under this clause causes an increase or decrease in the Contractor's cost of the time required for the performance of any part of the work under this contract, whether or not changes by any order, an equitable adjustment shall be made and the contract modified in writing accordingly: provided, however, that except for claims based on defective specifications, no claim for any change under (b) above shall be allowed for any costs incurred more than 20 days before the Contractor gives written notice as therein required.
- (e) If the Contractor intends to assert a claim for an equitable adjustment under this clause, he must, within 30 days after receipt of a written change order under (a) above or the furnishing of a written notice under (b) above, submit to the Owner a written statement setting forth the general nature and monetary extent of such claim, unless this period is extended by the Owner. The statement of claim hereunder may be included in the notice under (b) above.
- (f) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract.

ARTICLE 4 PROTECTION OF TREES

The Contractor shall take special care to preserve and protect from injury all trees located along the lines of construction, and no such trees shall be cut down, trimmed, or otherwise cut without permission from the Owner.

ARTICLE 5 HURRICANE PROTECTION

Should hurricane warnings be issued, the Contractor shall take every precaution to minimize danger to person, to the work and to adjacent property. These precautions shall include closing all openings, removing all loose materials, tools and equipment from exposed locations, and removing all scaffolding and other temporary work.

ARTICLE 6 DIFFERING SITE CONDITIONS

- (a) The Contractor shall promptly and before such conditions are disturbed, notify the Owner in writing of: (1) sub-surface or latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in this contract. The Owner shall promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the contract modified in writing accordingly.
- (b) No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required in (a) above; provided, however, the time prescribed therefore may be extended by the Owner.
- (c) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract.

ARTICLE 7 DISPOSAL OF MATERIALS

The materials used in the construction of the work, shall be disposed away from the site in such manner so that will not endanger persons or the work, and so that free access may be had at any time to all areas in the vicinity of the work. The materials shall be kept trimmed up so that as little inconvenience as possible to the public or adjoining tenants is caused.

ARTICLE 8 INTERFERENCE WITH EXISTING STRUCTURES

Whenever it may be necessary to cross or interfere with existing utilities or other structures needing special care, due notice shall be given to the Owner, and the work shall be done according to their directions. Whenever required, all objects shall be strengthened to meet any additional stress that the work herein specified may impose upon it, and any damage caused shall be thoroughly repaired. If so directed by the Owner, the location of any existing structure shall be changed to meet the requirements of the new work.

The Contractor shall be responsible for all utilities or structures encountered during the progress of the work and shall repair and be responsible for correcting all damages to the Owner. The Contractor shall contact the proper utility or authority to correct or make any changes due to utilities or other obstructions during the Project but the entire responsibility and expense shall be with the Contractor.

All damaged items of work or items required to be removed and replaced due to construction shall be replaced or repaired by the Contractor to the complete satisfaction of the property Owner and/or the Owner, and at no additional expense to the Owner.

ARTICLE 9 DEFECTIVE MATERIALS AND TESTING

No materials shall be laid or used which are known, or may be found to be in any way defective. Any materials found to be defective at the site of work or upon installation shall be replaced by the Contractor at his own expense. Notice shall be given to the Owner of any defective or imperfect material. Defective or unfit material found to have been laid, shall be removed and replaced by the Contractor with sound and unobjectionable material without additional cost to the Owner.

The Contractor shall submit samples, as required by the Owner, of the various materials used on the contract work for testing purposes.

All ordering lists shall be submitted by the Contractor to the Owner for approval and shall be approved before the ordering of the materials.

ARTICLE 10 FINISHING AND CLEANING UP

In completing his operations, the Contractor shall immediately remove all surplus material, tools, and other property belonging to him, leaving the entire site and surroundings free and clean and in good order, at no additional expense to the Owner.

ARTICLE 11 CLEAN UP AT THE CONTRACTOR'S EXPENSE

In case the Contractor fails or neglects to promptly remove all surplus materials, tools, and incidentals after backfilling, leaving the site or surrounding area clean and free of debris, and do the required repaving when ordered, the Owner may, after 24 hours notice, cause the work to be done and the cost thereof deducted from any payment due to the Contractor.

ARTICLE 12 RIGHTS OF ACCESS

Nothing herein contained or shown on the drawings shall be construed as giving the Contractor exclusive occupancy of the work area. The Owner or any other contractors employed by him, the various utility companies, contractors or subcontractors employed by State or Federal agencies, or any other agencies involved in the general project or upon public rights-of-way, may enter upon or cross the area of work or occupy portions of the area as is directed or necessary. When the territory of one contract is the convenient means of access to the other, the Contractor shall arrange his work in such a manner as to permit such access to the other and prevent unnecessary delay to the work as a whole.

ARTICLE 13 EXISTING UTILITIES OR CONNECTIONS

The location of existing underground pipes, conduits, and structures as shown has been collected from the best available sources and the Owner together with his agents, does not imply or guarantee the data and information in connection with underground pipes, conduits, structures, and such other parts, as to their completeness, nor their locations as indicated. The contractor shall assume that there are existing water, gas, and other utilities in the site, whether they appear on the drawings or not. Any expense and/or delay occasioned by utilities and structures or damage thereto, including those not shown, shall be the responsibility of the Contractor, at no additional expense to the Owner.

Before proceeding with construction operations, the Contractor shall make such supplemental investigations, including exploratory excavations by hand digging, as the Contractor deems necessary to uncover and determine the exact locations of utilities and structures and shall have no claims for damages due to encountering subsurface structures or utilities in locations other than those shown on the drawings, or which are made known to the Contractor prior to construction operations. The Contractor shall be responsible and liable for all damages to existing utilities and structures.

ARTICLE 14 DUST CONTROL

The Contractor shall exercise every precaution and means to prevent and control dust arising out of all construction operations from becoming a nuisance to the property or surrounding neighborhoods. Repeated daily dust control treatment shall be provided to satisfactorily prevent the spread of dust until the project site is stabilized and until earth stockpiles have been removed, and all construction operations that might cause dust have been completed. No extra payment will be made for dust control measures, compensation shall be considered to be included in the prices stipulated for the appropriate items as listed in the bid.

ARTICLE 15 WORK BY OTHERS

The Owner reserves the right to do any other work which may be connected with, or become a part of, or be adjacent to the work embraced by this contract, at any time, by contract or otherwise. The Contractor shall not interfere with the work of such others as the Owner may employ, and shall execute his own work in such a manner as to aid in the execution of the work of others as may be required. No backfilling of trenches or excavations will be permitted until such work by the Owner is completed.

ARTICLE 16 FIRE AND POLICE NOTIFICATION

If it becomes necessary at any time to temporarily barricade a street or cause detours to be put up, or rerouting of traffic, the Fire and Police Departments, SEAT, and Board of Education shall be notified by the Contractor, and their consent obtained before any such action is initiated.

ARTICLE 17 FAILURE TO REPAIR

Any emergency arising from the interruption of electric, gas, water, telephone, sewer and cable service due to the activities of the Contractor, shall be repaired by the Contractor as quickly as is possible.

If and when, in the opinion of the Owner, the Contractor is not initiating repair work as expeditiously as possible upon notification to do so, the Owner may, at his own option, make the necessary repairs using his own forces or those of others. The cost of such repairs shall be subtracted from the payments due to the Contractor.

ARTICLE 18 BLASTING

The Owner believes there will be no blasting required as part of this project; however, in the event rock is encountered the following conditions apply.

In the rock excavation it is especially required that the blasting shall be conducted with all possible care in order to avoid injury to persons and property. The rock shall be well covered and a sufficient warning shall be given to all persons in the vicinity of the work before blasting occurs.

The explosives used shall be of such power and placed in such quantities and positions that will not make the excavation unduly large nor shatter unnecessarily upon or against where the work is to be installed nor injure the work already in place. Where masonry is to be built against the rock, all loose or shattered rock shall be completely removed so the masonry can be built firmly in contact with the solid rock.

Explosives must be carefully transported, stored, handled, and used as required by the local and State laws, and the necessary permits from the Fire Marshal, for such transportation, storage, handling, and use shall be obtained by the Contractor who shall show such permits to the Owner before any blasting is allowed. Before any explosives, such as dynamite or detonator caps are stored for use, the Contractor shall contact the Fire Department for instructions relative to the regulations for possession and use of explosives.

Under any circumstances, the approval of the Owner shall first be obtained before blasting is permitted. Where, in the opinion of the Owner, blasting is unsafe or dangerous to persons or existing structures and utilities, the Contractor shall employ pneumatic tools, drilling and splitting mechanically or by hand or other means not requiring the use of explosives for the removal of rock, boulders or ledge; at no added expense to the Owner.

Before any explosives, such as dynamite or detonator caps are stored or used at the site of work under this contract, the Contractor shall notify the Fire Department for instructions relative to the regulations for possession and use of explosives in the project area. The Contractor shall obtain all required permits or licenses for possession and use of explosives in the site of construction. In addition the Contractor shall be responsible for:

1. A man who shall be responsible for the explosive materials at all times.
2. The keeping of records which shall show by date the explosive materials delivered on the site, the explosive materials used for construction, and the materials removed from the site after blasting is completed.
3. For the non-storage of explosive materials over-night on the site of construction under this contract.
4. The immediate reporting to the Police Department and Fire Department of all unaccounted for explosive materials.

All records relating to the possession and use of explosive materials under this contract shall be open to inspection by the Police Department, Fire Department and Owner, at any time.

The use of explosives on privately owned properties shall be subject to additional requirements of the above-mentioned property Owner.

In addition to other requirements specified and all other measures, the Contractor shall be held responsible for completely, adequately, and carefully covering all blasts with suitable blasting mats in such a manner as to prevent damage to landscape features, structures, facilities, or other surrounding objects, and in a manner that will prevent injury to persons.

The use of the maximum number of drill holes, together with the minimum number of explosives in each drill hole and using split-second delayed caps, is the preferred method of accomplishing the blasting operations in conjunction with the rock excavation. The Contractor shall keep blasting logs of all his blasting operations. The blasting logs shall include all pertinent information with respect to personnel, times, locations, description of charges, methods, details of blasting patterns, excavations, and such other information as may be required. The Contractor shall furnish to the Owner each day that blasting operations are performed, certified copies of the Contractors blasting logs covering all of his blasting operations.

Unless specifically permitted, no blasting shall be done between the hours of sunset and sunrise on any day, and no blasting will be allowed on Sundays or legal holidays in the State of Connecticut.

ARTICLE 19 CONSTRUCTION LAYOUT

The work will consist of construction layout and reference staking necessary for the proper control and satisfactory completion of all work on the project.

All stakes used for control staking shall be of the same quality as used by the DOT for this purpose. Where laser grade control is used, a reference stake for verifying height of laser shall be required from the Contractor.

The Contract Documents provide the Contractor such control points, bench marks, and other data as may be necessary for the construction staking and layout by qualified engineering or surveying personnel. The Contractor shall be responsible for the preservation of ties to all control points necessary for the accurate re-establishment of all base lines or centerlines shown on the plans. All stakes, references, and batter boards including original, additional or replacement, which may be required for the construction operations, illumination work, signing and traffic control shall be furnished, set and properly referenced by the Contractor. Contractor shall be solely and completely responsible for the accuracy of the line and grade of all features of the work. Any errors or apparent discrepancies found in previous surveys, plans, specifications or special provisions shall be called to the Engineer's attention by the Contractor for correction or interpretation prior to proceeding with the work.

All staking shall be performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout and staking of the type required under the contract and who are acceptable to the Engineer. The personnel shall perform this staking under the direct supervision of a person, or persons, of engineering background experienced in the direction of such work and acceptable to the Engineer.

The Owner may check the work, as established by the Contractor, at any time as the work progresses. The Contractor will be informed of the results of these checks, but the Owner by so doing in no way relieves the Contractor of his responsibility for the accuracy of the layout work. The Contractor shall, at his expense, correct or replace as required any deficient layout and construction work which may be the result of inaccuracies in his staking operations or of his failure to report inaccuracies in his staking operations or of his failure to report inaccuracies found in work done by the Owner or by others. If, as a result of these inaccuracies, the Owner is required to make further studies, redesign, or both, all expenses incurred by the Owner due to such inaccuracies will be deducted from any monies due the Contractor.

The Contractor shall furnish all necessary personnel, engineering equipment and supplies, materials, transportation, and work incidental to the accurate and satisfactory completion of this work.

5660-02-a2516-specs-18-special conditions

SECTION VII

Special Provisions

**TOWN OF MONROE, CONNECTICUT
TRACK AND FIELD IMPROVEMENTS
AT
MASUK HIGH SCHOOL**

INDEX TO SPECIAL PROVISIONS

| | | <u>PAGE</u> |
|------------------|---|-------------|
| SECTION 00 00 01 | INTRODUCTION TO SPECIAL PROVISIONS | SP-1 |
| SECTION 00 00 02 | NOTICE TO CONTRACTOR – SCHEDULE OF VALUES | SP-3 |
| SECTION 00 00 03 | NOTICE TO CONTRACTOR – SPECIAL SITE CONDITIONS | SP-6 |
| SECTION 11 68 23 | ATHLETIC EQUIPMENT | SP-7 |
| SECTION 11 68 33 | IRRIGATION VAULT | SP-15 |
| SECTION 11 68 43 | BID ALTERNATE NO. 1 - MULTIPURPOSE SCOREBOARD | SP-18 |
| SECTION 26 05 00 | COMMON WORK RESULTS FOR ELECTRICAL | SP-23 |
| SECTION 26 05 09 | ELECTRICAL DEMOLITION REQUIREMENTS | SP-27 |
| SECTION 26 05 26 | GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS | SP-29 |
| SECTION 26 05 43 | UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS..... | SP-37 |
| SECTION 26 05 53 | IDENTIFICATION FOR ELECTRICAL SYSTEMS..... | SP-49 |
| SECTION 26 56 68 | BID ALTERNATE NO. 3 - EXTERIOR ATHLETIC LIGHTING | SP-59 |
| SECTION 27 51 16 | BID ALTERNATE NO. 2 - PUBLIC ADDRESS SYSTEM | SP-69 |
| SECTION 31 10 00 | SITE PREPARATION..... | SP-71 |
| SECTION 31 20 00 | EARTH MOVING | SP-74 |
| SECTION 31 22 00 | SEDIMENTATION AND EROSION CONTROL MEASURES | SP-83 |
| SECTION 32 12 16 | BITUMINOUS CONCRETE PAVING..... | SP-85 |
| SECTION 32 12 19 | STONE DUST SURFACES | SP-89 |

| | | |
|------------------|--|--------|
| SECTION 32 13 13 | CONCRETE PAVING AND CURBING | SP-91 |
| SECTION 32 13 16 | CAST-IN-PLACE CONCRETE..... | SP-95 |
| SECTION 32 13 73 | CONCRETE PAVING JOINT SEALANTS..... | SP-104 |
| SECTION 32 31 14 | CHAIN LINK FENCES AND GATES..... | SP-107 |
| SECTION 32 31 21 | GOAL POSTS | SP-110 |
| SECTION 32 92 00 | TOPSOIL AND SEEDING | SP-112 |
| SECTION 33 32 30 | SYNTHETIC INFILLED ATHLETIC TURF SURFACE | SP-118 |
| SECTION 33 33 00 | SYNTHETIC TRACK..... | SP-128 |
| SECTION 33 41 00 | STORM UTILITY DRAINAGE PIPING | SP-135 |
| SECTION 33 42 00 | TRACK EDGE DRAIN SYSTEM..... | SP-139 |
| SECTION 33 46 23 | SYNTHETIC FIELD SUBSURFACE DRAINAGE | SP-141 |

5660-02-a2516-specs-0000000 index to special provisions

INTRODUCTION TO THE SPECIAL PROVISIONS

This Special Provision Section consists of provisions, requirements and specifications that shall apply to the various items of work which constitute the construction contemplated under this Contract.

Within the Special Provisions and/ or other portions of the Contract Documents, the following definitions shall apply:

1. **Contract Documents:** Shall mean that group of documents included in the agreement between the Owner and the Contractor as follows; Invitation to Bid, Information for Bidders, Bid Proposal Form, Contract Forms, General Conditions, Supplemental General Conditions, Special Conditions, Special Provisions, Standard Specifications, Supplemental Specifications, Prevailing Wage Rates, Appendix.

2. **Standard Specifications:** The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, Form 816, 2004, as revised by the Supplemental Specifications dated January 2013 (otherwise referred to collectively as the Standard Specifications) is hereby made part of this contract, as modified by these Special Provisions. Only Division II "Construction Details," Division III "Materials Section" and referred to portions of Divisions I "General Requirements and Covenants" of the Standard Specifications shall apply.

It should be noted that all references to the Articles for "Method of Measurement" and "Basis of Payment" of each Section of Division II of the Standard Specifications Sections shall be deleted and replaced with the following:

"Measurement and Basis of Payment – The work under this Section will not be measured for payment. Payment for this work, complete in place, including all materials, equipment, tools, labor and incidentals thereto for the satisfactory completion of the work shall be included in the appropriate various Lump Sum Bid Items that are listed in the Bid Schedule".

It should also be noted that all other requirements of Divisions II and III of the Standard Specifications Sections shall apply except that portions of the Standard Specifications may be supplemented, revised amended and/ or replaced by the Special Provisions. The Special Provisions shall govern as modified and shall supercede the requirements of the Standard Specifications.

Within the referred to portions of the Standard Specifications wherein the following terms are used, they shall mean respectively:

Engineer, State, Department,
Commissioner

Town of Monroe acting directly or
through a duly-authorized
representative.

Inspector

Town of Monroe acting directly or

through a duly-authorized representative assigned to make inspections of the work performed and materials furnished by the Contractor.

Laboratory

Laboratory designated by the Town of Monroe.

3. **Applicable Safety Code:** shall mean the latest edition including any and all amendments, revisions, and additions thereto of the Federal Department of Labor, Occupational Safety and Health Administration's "Occupational Safety and Health Standards" and "Safety and Health Regulations for Construction," the State of Connecticut, Labor Department, "Construction Safety Code," or State of Connecticut "Building Code," whichever is the more stringent for the applicable requirement.
4. **Regulatory Agency (ies):** Regulatory Agency(ies) shall be defined as the governing body or authority having jurisdiction over or responsibility for a particular activity within the scope of this Contract. They may be as specifically defined within the Contract Documents; otherwise the Contractor shall be responsible for determining and complying with the Regulatory Agency(ies) having jurisdiction in the local area of the proposed work under this Contract.
5. **"Coordination of Plans and Specifications and Other Contract Requirements":**

All requirements indicated on the Contract Drawings or in the Special Provisions, the Standard Specifications, the Supplemental Specifications, or other Contract provisions shall be equally binding on the Contractor, unless there is a conflict between or among any of those requirements. In the case of such a conflict, the order of governance among those requirements, in order of descending authority, shall be as follows:

1. Environmental Permits;
2. Environmental Permit Applications;
3. Special Provisions;
4. Contract Drawings (enlarged details on plans, used to clarify construction, shall take precedence over smaller details of the same area. Information contained in schedules or tables, titled as such, shall take precedence over other data on plans);
5. Supplemental Specifications;
6. Standard Specifications and other Contract requirements

5660-02-a2516-specs-21 -intro to special provisions

NOTICE TO CONTRACTOR - SCHEDULE OF VALUES

1. LUMP SUM BID PRICES

All work for this project shall be performed under the Lump Sum Bid Items. It is the intent of this provision that the value of the following elements of the work within the project when added together shall equal the Total Lump Sum bid. Should the Contractor have any questions regarding the specific elements of work to be included within each schedule of value item, said question shall be directed to the Owner, in writing, sufficiently in advance of the bid date in order to allow for a proper response (see Instructions to Bidders).

2. LUMP SUM BID ITEMS

A. Site Preparation

The work under this item shall include all personnel and equipment necessary for mobilization including the movement of all the contractor's field offices, buildings, facilities, safety fencing, and equipment to and from the project site, construction staking, clearing and grubbing, protection of the existing track, as shown on the drawings and necessary for the performance of the work. If test pits are needed, it will be considered work under this item. This work shall also include all materials, equipment, and labor for the installation and maintenance of a construction entrance pad and sedimentation and erosion controls, including but not limited to sediment filter fence, hay bales, and inlet protection required by the plans all in accordance with the plans and specifications. This item shall also include any effort associated with profit and coordination with the selected synthetic turf manufacturer/vendor.

B. Site Removals

The work under this item shall include all materials, equipment, and labor to perform the removal of all items shown on the plans including but not limited to the removal of existing drainage pipes and structures, irrigation system, electrical vaults, saw cutting pavement, existing EPDM track surface and bituminous concrete, existing fencing.

C. Earthwork and Grading

The work under this item shall include all materials, equipment, and labor to perform necessary grading operations as shown on the Contract Drawings and described in the Technical Specifications under General Excavation, Disposal of Surplus Material and Subgrade/Fine grade. Work under this item shall also include all stripping and stockpiling and grading brought to the subgrade elevation required prior to the application of base material, processed stone, or topsoil.

D. Athletic Field Subsurface Drainage System

The work under this item shall include all materials, equipment, and labor for the installation of a subsurface field drainage system, complete, including but not limited to collector pipe system, drainage structures, all base material, free draining stone, and geotextile material. This shall also include converting existing yard drains to manholes and any other drainage improvements. Stone base material shall be installed to the depth

and location as shown on the Contract Drawings and as specified in the Technical Specifications.

- E. Synthetic Turf and Resilient Polypropylene Shock/Drainage Pad
The work under this item shall include all materials, equipment, and labor to install the synthetic turf field, complete, including but not limited to installation of synthetic turf and infill material, and field markings as shown on the Contract Drawings and as specified in the Technical Specifications. This item shall also include the supply and installation of the resilient polypropylene shock/drainage pad. This item was bid by turf manufacturer/vendors as part of RFP# 2016-3. The successful Contractor shall subcontract with the selected turf/manufacturer/vendor and carry the lump sum bid price which is provided in the Bid Proposal Form. Any allocations for profit or coordination should be included in Lump Sum Bid Item A.
- F. Running Track Expansion and D Zone, Complete
The work under this item shall include all materials, equipment, and labor to furnish and install the 2 new track lanes along the sprint section, and d-zones including but not limited to all required base material, stone base course, and bituminous binder and wearing course, EPDM track surface and event striping, track edge drain, and flush poured-in-place concrete anchor curb, and installation of track radius monuments.
- G. Site Amenities
The work under this item shall include all materials, equipment, and labor necessary for the installation of new football goal posts, installation of ball safety netting sleeves in the d-zones, installing a new pole vault box in the paved d-zone, new discus pad and cage, new sandpit, new shot put area and bituminous walkways and fencing and gates along the new sprint lanes as specifically referenced on the Contract Drawings and described in the Technical Specifications.
- H. Site Electrical Improvements
The work under this item shall include all materials, equipment, and labor to furnish and install all conduit, ground fault circuit interrupter (GFCI) outlets, bedding material, trenching, backfilling, pull boxes, conduits and pull cords for future wiring of scoreboard, audio and athletic field lighting which may be added to project if funding permits, and furnishing and installation of proposed athletic field light pole bases.

3. ALTERNATE BID ITEMS:

- No 1. New Scoreboard
The work under this item shall include all materials, equipment, and labor to install the scoreboard with foundations and support systems. This work will include but not be limited to formation of subgrades, formation of forms, reinforcement and wiring for power as shown on the Contract Drawings and as specified in the Special Provisions. The conduit, pull cords and pull boxes for this work are to be installed as part of Lump Sum Bid Item H.

No 2. New Audio System

The work under this item shall include all materials, equipment, and labor to furnish and install a new audio system in the existing press box as specified on the contract drawings and project manual. The conduit, pull cords and pull boxes for this work are to be installed as part of Lump Sum Bid Item H.

No 3. New Athletic Field Lighting

The work under this item shall include all materials, equipment, and labor to remove and replace all of the existing lighting fixtures, poles, and foundations on the 4 poles as shown on the Contract Drawings and as detailed in the Special Provisions. Contractor should give consideration to the geotechnical report included in the appendix and take into account any anticipated rock drilling for foundation installation. Contractor should also give consideration for construction sequence for installation of lighting fixtures and foundations. The conduit, pull cords and pull boxes, and light pole foundations for this work are to be installed as part of Lump Sum Bid Item H. This item also includes the necessary electrical service upgrade, new controllers, and any other work required to electrify the new lighting system.

No 4. Conduit from Concessions to Main Building

The work under this item shall include all materials, equipment, and labor to furnish and install conduit, pull cords and pull boxes from the main building to the existing concessions building. This work will include but not be limited to trenching, installation, backfilling, reestablishment of grass and pavement as shown on the Contract Drawings and as specified in the Special Provisions.

No 5. Ball Safety Netting and Posts in D-zones

The work under this item shall include all materials, equipment, and labor to furnish and install ball safety netting and posts in the d-zones as shown on the Contract Drawings and as specified in the Special Provisions.

5660-02-a2516-specs-21a -ntc schedule of values

NOTICE TO CONTRACTOR – SPECIAL SITE CONDITIONS

These items will be reviewed in greater detail during the preconstruction meeting to be held prior to the initiation of construction activities at the time and date to be determined.

1. PROTECTION OF THE EXISTING TRACK

The contractor is advised that special care will be required during construction to protect the integrity of the existing track. The contractor will be responsible for all repairs to the existing track caused by construction activities.

2. SITE SECURITY – ID BADGES

Security badges will be worn by all project personnel during the period of time when school is in session. Prior to the commencement of construction, the Owner will provide badges at no cost to the contractor. The contractor will be responsible for monitoring the display of the badges, including those of the personnel of all subcontractors and visitors to the project site.

3. SAFETY PLAN

As the area immediately surrounding the project area will be being used by students and the public alike, safety of the work site will be of the utmost importance to the Town. Because of this, prior to the commencement of construction, the contractor shall prepare a project-specific health and safety plan for approval by the owner.

4. PROTECTION OF EQUIPMENT AND MATERIALS

It shall be the responsibility of the Contractor to secure and protect all equipment and materials stored at the site by whatever means they see fit throughout the duration of the project.

5660-02-a2516-specs-21b -ntc special site conditions

SECTION 11 68 23 ATHLETIC EQUIPMENT

PART 1 – GENERAL

1.1 SUMMARY

A. Work Included: Furnish and installing all athletic equipment including:

1. Shot Put Poly Toe Board
2. Aluminum Shot Circle
3. 20' Ht. Ball Safety Netting – **BID ALTERNATE NO. 5 (POSTS & NETS)**
4. Pole Vault Box and Cover
5. Discus Cage
6. Aluminum Discus Circle
7. Long Jump Sand Pit Form and Covers
8. Long Jump Take-off Board System

B. Related sections include the following:

1. Section 31 20 00 Earth Moving
2. Section 32 12 16 Bituminous Concrete Paving
3. Section 32 12 19 Stone Dust Surface
4. Section 32 13 16 Cast-in-Place Concrete
5. Section 33 33 00 Synthetic Track
6. Section 33 41 00 Storm Utility Piping

1.2 SUBMITTALS

A. Manufacturers Product Data

1. Provide manufacturers product data prior to actual field installation work, for Architects or Owners representatives review.

B. Shop Drawings

1. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for Architects or Owners representatives review.

C. Manufacturer shall certify that all equipment meets current NFHS regulations and standards.

1.3 QUALITY ASSURANCE

A. All materials and construction methods shall conform to Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction", 2004 edition including supplements, unless otherwise specified herein.

- B. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.

1.4 PRODUCT DELIVERY AND STORAGE

- A. Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the Owners representative. Replacements, if necessary, shall be immediately re-ordered, so as to minimize any conflict with the construction schedule. Sound materials shall be stored above ground under protective cover or indoors so as to provide proper protection.

PART 2 – PRODUCTS

2.1 SHOT PUT TOE BOARD

- A. Base: TFSPT001AL 3/4" Depressed Pad Shot Put Toe Board Equipment and Accessories as Manufactured and/or Supplied by:

Sportsfield Specialties, Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

Or approved equal.

- B. Components: TFSPT001AL 3/4" Depressed Pad Shot Put Toe Board Equipment and Accessories

- 1. 3/4" Depressed Pad Shot Put Toe Board:
 - a. Fabricated of Cast Aluminum
 - b. Powder Coated White Finish
 - c. 34.92° Black Vinyl Sector Line Indicators
 - d. 3.25" Height for Depressed Concrete Throw Pad
 - e. Model Specific Hardware Kit and Installation Instructions

2.2 ALUMINUM SHOT PUT CIRCLE

- A. TFSPH084AL 3/4" Depressed Shot Put Throw Ring Equipment and Accessories as Manufactured and/or Supplied by:

Sportsfield Specialties, Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753

p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

B. Components: TFSPH084AL 3/4" Depressed Pad Discus Throw Ring Equipment and Accessories

1. TFSPH084AL L 3/4" Depressed Pad Discus Throw Ring:
 - a. Fabricated of 2" x 2" x ¼" (0.25") thick rolled aluminum angle
 - b. 84" inside diameter – Shot put
 - c. ¾" (0.75") recessed concrete installation screed line
 - d. Stainless steel assembly hardware
 - e. Model specific hardware kit and installation instructions

2.3 BALL SAFETY NETTING (15' Ht.) – **BID ALTERNATE NO. 5 (POSTS, NETS & HARDWARE)**

- A. As part of the base bid furnish and install ground sleeves with caps only, ball safety netting posts and nets shall be furnished and installed per the Contract Documents if **BID ALTERNATE NO. 5** is selected by the owner.
- B. Model: TFBSS415P-SG - Ball Safety Netting System as manufactured by:

Sportsfield Specialties Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

or approved equal

C. Components:

1. Upright Posts Fabricated with 4.0in OD x .125in Wall 6061 Aluminum Tube & 3-1/2" SCH 80 Aluminum Pipe:
 - a. Height Above Ground equal to system height plus 1Ft (for hardware)
 - b. Black Powder Coated Finish
2. Upright Post Ground Sleeves Fabricated with 4.30in OD (4.10in ID)
 - a. 48.0in Length
 - b. Ground Sleeve Caps
3. Ball Safety Net:
 - a. #36 Black Nylon 1-3/4" Mesh
 - b. Tethers 2X net height + 5Ft
4. Accessories:
 - a. Stainless Steel Assembly Hardware
 - b. Shell Block Pulley System
 - c. 6.0in Net Guide Rings

- d. Black Vinyl Coated Wire Rope
- 5. Concrete Foundation

2.4 POLE VAULT BOX AND COVER

- A. Base: TFPV001CA-Y Cast Aluminum Pole Vault Box Powder Coated Yellow Equipment and Accessories as Manufactured and/or Supplied by:

Sportsfield Specialties, Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

Or approved equal.

- B. Components: TFPV001CA-Y Cast Aluminum Pole Vault Box Powder Coated Yellow Equipment and Accessories:

- 1. TFPV001CA-Y Pole Vault Boxes and Cover Plugs:
 - a. Cast Aluminum
 - b. Set Side Wings for Secure Concrete Encasement Method
 - c. Powder Coated Yellow Finish on Cast Aluminum Pole Vault Boxes
 - d. 8"W Reverse Bend at Pole Vault Box Entry Area
 - e. Optional Cover Plug Fabricated of 1/8" (0.125") Thick Aluminum with 1/2" (0.5") Recess to Accept Synthetic Track Material by Others, Fills Void and Prevents Water from Getting in Pole Vault Box
 - f. Model Specific Installation Instructions

- C. Base: TFPV003ALTR-CA - Vault Box Cover Plug as manufactured by:

Sportsfield Specialties Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481

Or approved equal.

- D. Components:

- 1. TFPV003ALTR-CA Cover Plug fabricated with 0.90in Aluminum understructure and .125in Aluminum top lid having the following attributes:
 - a. Sized to Fill Void of Standard Cast Aluminum Vault Box

- b. Top Surface Recessed 0.50in to Accept Synthetic Track Material

2.5 ALUMINUM DISCUS CIRCLE

- A. TFD099AL 3/4" Depressed Pad Discus Throw Ring Equipment and Accessories as Manufactured and/or Supplied by:

Sportsfield Specialties, Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

Or approved equal.

- B. Components: TFD099AL 3/4" Depressed Pad Discus Throw Ring Equipment and Accessories

- 1. TFD099AL 3/4" Depressed Pad Discus Throw Ring:
 - a. Fabricated of 2" x 2" x 1/4" (0.25") thick rolled aluminum angle
 - b. 98.5" inside diameter – discus
 - c. 3/4" (0.75") recessed concrete installation screed line
 - d. Stainless steel assembly hardware
 - e. Model specific hardware kit and installation instructions

2.6 DISCUS CAGE

- A. BASE: TFDCHS-EXT High School Discus Cage Equipment and Accessories as Manufactured and/or Supplied by:

Sportsfield Specialties, Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

Or approved equal.

- B. Components: TFDCHS-EXT High School Discus Cage Equipment and Accessories

- 1. TFDCHS-EXT High School Discus Cages:
 - a. Upright Poles Fabricated of 4" O.D. x 1/8" (0.125") Thick Wall 6061 Aluminum Tube with 3' (36") Arced Rolled Offset, 14' Above Finish Grade
 - b. Standard Aluminum Mill Finish

- c. Aluminum Net Attachment Extension Arms Fabricated of 2" x 2" x 1/8" (0.125") Square Aluminum Tube with Upright Pole U-Bolt Fastener
- d. Ground Sleeves Fabricated of 4.3" O.D., 4.1" I.D. Aluminum Pipe with Welded Base Plate, Include Upright Pole Alignment Bolt and Black Plastic Friction Fit Cap
- e. #36 Black Nylon Net, 1-3/4" Square Mesh with Rope Bound Perimeter
- f. High School Standard Size and Layout
- g. Stainless Steel Assembly Hardware
- h. Model Specific Hardware Kit and Installation Instructions

2.7 LONG JUMP PIT FORMS AND COVERS

- A. Base: SP6022 JumpForm® High School 3M x 7M Sand Pit with Cover Ledges Equipment and Accessories as Manufactured and/or Supplied by:

Sportsfield Specialties, Inc.
 P.O. Box 231
 41155 State Highway 10
 Delhi, NY 13753
 p. 888-975-3343
 f. 607-746-8481
www.sportsfieldspecialties.com

- B. Components:

1. SP6022 Long/Triple JumpForm® Systems and Accessories (Patented):
 - a. Base Forms Fabricated of 1/8" (0.125") Thick Aluminum, 150mm (6") Wide x 2m (6.56') Long x 395mm (15.6") High
 - b. Pre-Fabricated Ninety Degree (90°) Corner Base Forms Fabricated of 1/8" (0.125") Thick Aluminum, 150mm (6") Wide x 1.72m (5.66') Long x 395mm (15.6") High
 - c. Bolt Together Aluminum Gusset Reinforced Construction
 - d. Male and Female Keyed Features
 - e. 2m (6.56') Long Runway Insert
 - f. Cover Ledge Model
 - g. Standard NFHS High School 3M x 7M
 - h. Straight and Pre-Fabricated Corner Cover Ledge Fabricated of 1/8" (0.125") Thick Aluminum and Have a Forty-Five Degree (45°) Angled Inside Cover Ledge
 - i. Welded 1/8" (0.125") Thick Aluminum Panel Cover Sets with Recessed Stainless Steel Lift Handles and 1/2" (0.5") Recess to Accept Synthetic Track Material by Others
 - j. Model Specific Hardware Kit and Installation Instructions

- C. Base: SP6820 High School Long/Triple Jump Sand Pit Covers as manufactured by:

Sportsfield Specialties, Inc.
 P.O. Box 231
 41155 State Highway 10
 Delhi, NY 13753

p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

D. COMPONENTS:

1. Covers: Fabricated of 0.125in Aluminum, Length and Width Determined by Pit Dimensions, with the following attributes:
 - a. Welded Construction
 - b. Recessed Stainless Steel Grab Handles
 - c. 0.50in Recessed Top Surface to Accept Synthetic Track Material

Sand pit covers shall be covered with track surfacing material and sit flush with surrounding track surfacing when in place.

2.8 LONG JUMP TAKE-OFF BOARD SYSTEM

- A. Base: TFLTP012SS-SYN IAFF/N.C.A.A. 12" Take-Off Board Equipment and Accessories as Manufactured and/or Supplied by:

Sportsfield Specialties, Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

- B. Components: TFLTP012SS-SYN IAFF/N.C.A.A. 12" Take-Off Board Equipment and Accessories
1. Long/Triple Jump Take-Off Board Systems:
 - a. 16 Gauge Stainless Steel Tray with One (1) 1" PVC Drain for Positive Connection to Subsurface Drainage.
 - b. 12" Widths x 48" Length
 - c. 8" and 16" Reversible Aluminum Insert is Factory Covered with $\frac{3}{4}$ " (0.75") Thick Synthetic White Polyboard on One (1) Side and Other Side Receives $\frac{1}{2}$ " (0.5") Synthetic Track Material by Others
 - d. 12" Stainless Steel Insert is Factory Covered with 8"W by $\frac{3}{4}$ " (0.75") Thick Synthetic White Polyboard Take-Off Board and 4"W by $\frac{3}{4}$ " (0.75") Thick Synthetic White Polyboard Foul Strip to be Covered with Plasticine During Competition, Includes Stainless Steel Adjustment Bolts, Two (2) Lift Handles and Stainless Steel Blanking Cover Insert to Receive $\frac{1}{2}$ " (0.5") Synthetic Track Material by Others
 - e. Model Specific Installation Instructions

PART 3 – EXECUTION

3.1 INSTALLATION - GENERAL

- A. All work shall be constructed as shown on the plans and as recommended per the manufacturers' specifications

3.2 CLEANING

- A. Clean up debris and unused material, and remove from the site.

END OF SECTION 11 68 23

5660-02-a2516-specs-116823 athletic equipment

SECTION 11 68 33 IRRIGATION VAULT

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Provide all equipment and materials, and do all work necessary to furnish and install the athletic equipment, as indicated on the drawings and as specified herein. Athletic equipment shall include, but not be limited to:

- 1. TC-3700-QCV TurfCool® Plus Quick Connect Valve Enclosure Box and Accessories

1.2 RELATED WORK

- A. Examine contract documents for requirements that affect work of this section. Other specification divisions and sections that directly relate to the work of this section include, but are not limited to:

- 1. Section 32 13 13 Cast-In-Place Concrete
- 2. Section 31 20 00 Earth Moving
- 3. Section 33 32 30 Synthetic Turf
- 4. Section 33 46 23 Subsurface Drainage System

1.3 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

- 1. National Federation of State High School Associations (NFHS)
- 2. National Collegiate Athletic Association (NCAA)
- 3. International Association of Athletics Federations (IAAF)
- 4. American Sports Builders Association (ASBA)
- 5. Manufacturers Data and Recommended Installation Requirements

1.4 SUBMITTALS

- A. Manufacturers Product Data

- 1. Provide manufacturers product data prior to actual field installation work, for Engineers or Owners representatives review.

- B. Shop Drawings

- 1. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for Architects or Owners representatives review.

1.5 QUALITY ASSURANCE

- A. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.

1.6 PRODUCT DELIVERY AND STORAGE

- A. Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the Owners representative. Replacements, if necessary, shall be immediately reordered, so as to minimize any conflict with the construction schedule. Sound materials shall be stored above ground under protective cover or indoors so as to provide proper protection.

PART 2 – PRODUCTS

2.1 TC-3700-QCV TurfCool® Plus Quick Connect Valve Enclosure Box and Accessories

- A. BASE: TC-3700-QCV TurfCool® Plus Quick Connect Valve Enclosure Box and Accessories as Manufactured and/or Supplied by:

Sportsfield Specialties, Inc.

P.O. Box 231

41155 State Highway 10

Delhi, NY 13753

p. 888-975-3343

f. 607-746-8481

www.sportsfieldspecialties.com

Or approved equal.

- B. COMPONENTS: TC-3700-QCV TurfCool® Plus Quick Connect Valve Enclosure Box
 - 1. Irrigation Valve, Quick Coupler Valve and Hose Reel Enclosure Boxes: 3/16" (0.1875") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
 - a. Box Dimensions: 15" H x 18" W x 18" D
 - b. 1/8" (0.125") Aluminum Adjustable Main Cover Support Ledge
 - c. Integrated Synthetic Infill Turf Attachment Ledge and Infill Retainer System with Flexible Gasket Seals (Synthetic Infill Turf Installation Applications Only)
 - d. 1" PVC Drain Stub for Positive Drainage Connection
 - 2. Main Cover and Hand Hole(s): 1/8" (0.125") Aluminum Construction with the Following Attributes:
 - a. Infill Retainer System with Flexible Gasket Seals (Synthetic Infill Turf Installation Applications Only)
 - b. Pad Lockable Main Cover and Turn Lockable Hand Hole(s)

- c. Designed to Allow Synthetic Turf or Synthetic Track Material to be Adhered Directly to the Aluminum Surface with Synthetic Adhesive and/or Mechanical Fasteners Determined by Others
- d. Main Cover and Hand Hole(s) Field Covered with Turf by Others
- 3. Included Accessories:
 - a. Stainless Steel Leveling Bolts
 - b. Stainless Steel Assembly Hardware
 - c. Factory Provided 3/8" Perforated Drainage Holes in Main Cover and Hand Hole(s) (Synthetic Infill Turf and Natural Grass Installation Applications Only)
 - d. Model Specific Hardware Kit and Installation Instructions
- 4. Optional Accessories:
 - a. NA

PART 3 – EXECUTION

3.1 INSTALLATION OF EQUIPMENT

- A. All TC-3700-QCV TurfCool® Plus Quick Connect Valve Enclosure Box and Accessories shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

END OF SECTION 11 68 33

5660-02-a2516-specs-116833 irrigation turf vault

BID ALTERNATE NO. 1

SECTION 11 68 43 MULTIPURPOSE SCOREBOARD

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Single-sided LED football/track scoreboard

1.2 REFERENCES

- A. Standard for Electric Signs, UL 48
- B. Standard for CSA C22.2 #207
- C. Federal Communications Commission Regulation Part 15
- D. National Electric Code

1.3 SUBMITTALS

- A. Product data: Submit manufacturer's product illustrations, data and literature that fully describe the scoreboards and accessories proposed for installation.
- B. Shop drawings: Submit mechanical and electrical drawings.
- C. Maintenance data: Submit manufacturer's installation, operation, and maintenance manuals.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Product delivered on site
- B. Scoreboard and equipment to be housed in a clean, dry environment

1.5 PROJECT CONDITIONS

- A. Environmental limitations: Do not install scoreboard equipment until mounting structure is secure and concrete has ample time to cure.
- B. Field measurements: Verify position and elevation of structure and its layout for scoreboard equipment. Verify dimensions by field measurements.
- C. Scoreboard manufacture to provide Stamped Engineered Drawings by CT Licensed engineer for foundation and supports
- D. Installation may proceed within acceptable weather conditions.

BID ALTERNATE NO. 1

1.6 QUALITY ASSURANCE

- A. For outdoor use
- B. Source Limitations: Obtain each type of scoring or related equipment through one source from a single manufacturer.
- C. ETL listed to UL 48
- D. NEC compliant
- E. FCC compliant
- F. ETL listed to CSA 22.2 #207

1.7 WARRANTY

- A. Provide 5 years of no cost parts exchange including standard shipping on electronics parts and radios due to manufacturing defects
- B. Provide toll-free service coordination
- C. Provide technical phone support during Daktronics business hours
- D. Provide access to a local authorized service provider within 2 hours and stocked parts with the ability to provide inventory
- E. Provide 5-year on-site Labor warranty from Authorized Service Provider

PART 2 – PRODUCTS

2.1 MANUFACTURER – UNITED STATES BASED MANUFACTURER ONLY

- A. Daktronics, Inc., Scoreboard Enterprises, Inc – 274 Fruit St., Mansfield, MA 02048 – 508-339-8113 – mark@scoreboardenterprises.com
- B. Or approved equal

2.2 PRODUCT

- A. Daktronics FB-2022 single-sided football/track scoreboard displays period or race time to 99:59.9, HOME and GUEST scores to 99, and DOWN/TO GO/BALL ON/QTR (quarter) information. T.O.L. (time outs left) to nine are optional. Arrows indicate possession. Scoreboard comes standard with track captions on changeable panels. During the last minute of the period, the clock displays time to 1/10 of a second.

BID ALTERNATE NO. 1

2.3 SCOREBOARD

A. General information

1. Dimensions: 8'-0" (2.44 m) high, 25'-0" (7.62 m) wide, 0'-8" (203 mm) deep
2. Base weight: 820 lb (372 kg) with vinyl captions – options may increase weight
3. Base power requirement: 705 W (white digits) with vinyl captions
4. Color: Red

B. Construction

1. Alcoa aluminum alloy 5052 for excellent corrosion resistance
2. Scoreboard back, face, and perimeter: 0.063" (1.60 mm) thick
3. Scoreboard top and bottom: 0.125" (3.18 mm) thick

C. Digits & Indicators

1. LED color: White
2. Clock digits: 30" (762 mm) high
3. HOME, GUEST, DOWN, TO GO, BALL ON, and QTR digits: 24" (610 mm) high
4. Seven bar segments per digit
5. PanaView® LED digit technology
6. All digits and indicators are sealed front and back with weather-tight silicone gel

D. Captions

1. Vinyl applied directly to scoreboard face; track captions are on changeable panels
2. HOME and GUEST captions: 15" (381 mm) high
3. DOWN, TO GO, BALL ON, QTR, and track captions: 12" (305 mm) high
4. Color: White

E. Accessory Equipment

1. Vinyl striping applied around the clock and scoreboard face, Color: White
2. Custom team name caption in place of HOME, "PANTHERS"
3. Two 43" (1.09 m) high, 31.125" (791 mm) wide vinyl logo/sponsor areas on lower corners of display face
4. Soccer captions on changeable panels
5. Lacrosse/field hockey captions on changeable panels
6. Standalone Time of Day (scoreboard acts as a clock when control console is unplugged/off)
7. Provide three (3) 24" x 25' - Full Depth Sponsor/ID Panels – includes painting to the color of choice and logos/artwork
8. Horn

BID ALTERNATE NO. 1

2.4 SCORING CONSOLE

- A. Console is an All Sport® 5000 controller
- B. Scores multiple sports using changeable keyboard inserts
- C. Controls multiple scoreboards and displays, including other All Sport 5000 controlled displays currently owned by customer
- D. Recalls clock, score, and period information if power is lost
- E. Console capable of automatically calculating and displaying DOWN & TO GO for each play
- F. Runs Time of Day and Segment Timer modes
- G. Console includes:
 - 1. Rugged aluminum enclosure to house electronics
 - 2. Sealed membrane water-resistant keyboard
 - 3. 32-character LCD to verify entries and recall information currently displayed
 - 4. Power cord that plugs into a standard grounded outlet; 6 watts max
 - 5. Control cable to connect to the control receptacle junction box (wired system only)
 - 6. Hand-held switch for main clock start/stop and horn
 - 7. Soft-sided carrying case
- H. Accessory Equipment
 - 1. 2.4 GHz spread spectrum radio system with frequency hopping technology and 64 non-interfering channels; system includes a transmitter installed inside the console and a receiver installed inside the scoreboard(s)]
 - 2. Hard carrying case
 - 3. Battery pack

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that mounting structure is ready to receive scoreboard. Verify that placement of conduit and junction boxes are as specified and indicated in plans and shop drawings. Verify concrete has cured adequately according to specifications.

3.2 INSTALLATION

- A. All power and control cables to scoreboards and displays will be routed in conduit. Power to the scoreboards/displays as well as raceways shown on electrical plans by the Electrical Contractor. Scoreboard control wiring including conduit will be the responsibility of the contractor assigned the scoreboard equipment.

BID ALTERNATE NO. 1

- B. Install scoreboards and exterior displays to beams in location detailed and in accordance with manufacturer's instructions. Verify unit is plumb and level.

3.3 INSTALLATION—CONTROL CENTER

- A. Provide boxes, cover plates and jacks in locations per plans.
- B. Test connect control unit to all jacks and check for proper operation of control unit, scoreboard and all features. Leave control unit in carrying case and other loose accessories with owner's designated representative.
- C. Verify earth ground does not exceed 15 ohms.

END OF SECTION 11 68 43

5660-02-a2516-specs-116843 multipurpose scoreboard

SECTION 26 05 00 COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Electrical equipment coordination and installation.
 - 2. Sleeves for raceways and cables.
 - 3. Sleeve seals.
 - 4. Grout.
 - 5. Common electrical installation requirements.

1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

- A. Product Data: For sleeve seals.

1.5 COORDINATION

- A. Coordinate arrangement, mounting, and support of electrical equipment:
 - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
 - 3. To allow right of way for piping and conduit installed at required slope.
 - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
- C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed.

- D. Coordinate sleeve selection and application with selection and application of firestopping.

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- C. Sleeves for Rectangular Openings: Galvanized sheet steel.
 - 1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Metraflex Co.
 - d. Pipeline Seal and Insulator, Inc.
 - 2. Sealing Elements: EPDM and/or NBR interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
 - 3. Pressure Plates: Plastic, Carbon steel, Stainless steel. Include two (2) for each sealing element.
 - 4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating, Stainless steel of length required to secure pressure plates to sealing elements. Include one (1) for each sealing element.

2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a thirty (30) minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches above finished floor level.
- G. Size pipe sleeves to provide ½-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."

- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials.
- K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly.

END OF SECTION 26 05 00

5660-02-a2516-specs-260500 - common work results for electrical

SECTION 26 05 09 ELECTRICAL DEMOLITION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition involving electrical system as described in Contract Documents.
- B. Related Sections:
 - 1. Section 260500 "Common Work Results for Electrical"
 - 2. New and replacement work specified in appropriate specification sections.

1.3 SCHEDULING

- A. Include on Construction Schedule sequence of individual electrical demolition operations.
- B. Coordinate with Owner for equipment and materials to be removed by Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. All relocations, reconnections and removals are not necessarily indicated on Drawings. All such work shall be included without additional cost to Owner.

3.2 PREPARATION

- A. Disconnect equipment that is to be removed or relocated. Carefully remove, disassemble or dismantle as required, and store in approved location on site, existing items to be reused in completed work.
- B. Where affected by demolition or new construction, relocate, extend or repair raceways, conductors, outlets and apparatus to allow continued use of electrical system. Use methods and materials as specified for new construction.

3.3 PERFORMANCE

- A. Perform drilling, cutting, block-offs and demolition work required for removal of necessary portions of electrical system. Do not cut joists, beams, girders, trusses or columns without prior written permission from Architect.
- B. Remove concealed wiring abandoned due to demolition or new construction. Remove circuits, conduits and conductors that are not to be re-used back to next active fixture, device or junction box.
- C. Patch, repair and finish surfaces affected by electrical demolition work, unless work is specifically called for under other Sections of the specifications.

3.4 CLEANING

- A. Remove obsolete raceways, conductors, apparatus and lighting fixtures promptly from site and dispose of legally.

END OF SECTION 26 05 09

5660-02-a2516-specs-260509 - electrical demolition requirements

SECTION 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes grounding systems and equipment, plus the following special applications:
 - 1. Underground distribution grounding.
 - 2. Ground bonding common with lightning protection system.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
 - 1. Test wells.
 - 2. Ground rods.
 - 3. Ground rings.
 - 4. Grounding arrangements and connections for separately derived systems.
 - 5. Grounding for sensitive electronic equipment.
- C. Qualification Data: For qualified testing agency and testing agencies field supervisor.
- D. Field quality-control reports.
- E. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - 1. Instructions for periodic testing and inspection of grounding features at test wells, ground rings, and grounding connections for separately derived systems based on NETA MTS and NFPA 70B.
 - a. Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
 - b. Include recommended testing intervals.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. 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.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 1. Solid Conductors: ASTM B 3.
 2. Stranded Conductors: ASTM B 8.
 3. Tinned Conductors: ASTM B 33.
 4. Sizes and types of conductors in four subparagraphs below are typical examples. 28-kcmil bonding cable in first subparagraph is slightly larger than No. 6 AWG.
 5. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, ¼ inch in diameter.
 6. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 7. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 8. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Bare Grounding Conductor and Conductor Protector for Wood Poles:
 1. No. 4 AWG minimum, soft-drawn copper.
 2. Conductor Protector: Half-round PVC or wood molding; if wood, use pressure-treated fir, cypress, or cedar.
- D. Grounding Bus: Predrilled rectangular bars of annealed copper, ¼ by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

2.2 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two (2) bolts.
 1. Pipe Connectors: Clamp type, sized for pipe.

- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless compression and exothermic-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad, sectional type; ¾ inch by 10 feet and 5/8 by 96 inches in diameter.
- B. Chemical-Enhanced Grounding Electrodes: Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts.
 - 1. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches long.
 - 2. Backfill Material: Electrode manufacturer's recommended material.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 24 inches below grade.
 - 2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.
- C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three (3) bands of green and two (2) bands of yellow.
- D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
 - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.
- E. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.

3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING SEPARATELY DERIVED SYSTEMS

- A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the equipment grounding conductor and to the frame of the generator.

3.4 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.
- C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.
- D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.5 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 1. Feeders and branch circuits.
 2. Lighting circuits.
 3. Receptacle circuits.
 4. Single-phase motor and appliance branch circuits.
 5. Three-phase motor and appliance branch circuits.

6. Flexible raceway runs.
 7. Armored and metal-clad cable runs.
 8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
 9. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
- B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- D. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- E. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- F. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.
1. For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
 2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a ¼-by-4-by-12-inch grounding bus.
 3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- G. Metal and Wood Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.6 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three (3) rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 260543 "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches deep, with cover.
 - 1. Test Wells: Install at least one (1) test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
- E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- F. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one (1) of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- G. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- H. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.
- I. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column and/or indicated item, extending around the perimeter of building, area, and/or item indicated.
1. Install tinned-copper conductor not less than No. 2/0 AWG for ground ring and for taps to building steel.
 2. Bury ground ring not less than 24 inches from building's foundation.
- J. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
 2. Bond grounding conductor to reinforcing steel in at least four (4) locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

3.7 LABELING

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems" Article for instruction signs. The label or its text shall be green.
- B. Install labels at the telecommunications bonding conductor and grounding equalizer and at the grounding electrode conductor where exposed.
1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
1. Manufacturer's Field Service: Contractor shall engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two (2) full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

C. Grounding system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 1 ohm(s).
5. Substations and Pad-Mounted Equipment: 5 ohms.
6. Manhole Grounds: 10 ohms.

F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

5660-02-a2516-specs-260526 - grounding and bonding for electrical systems

SECTION 260543 UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Conduit, ducts, and duct accessories for direct-buried and concrete-encased duct bank, and in single duct runs.
2. Handholes and pull boxes.
3. Manholes.

1.3 DEFINITION

- A. RNC: Rigid nonmetallic conduit.
- B. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.4 SUBMITTALS

- A. Product Data: For the following:

1. Duct-bank materials, including separators and miscellaneous components.
2. Ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
3. Accessories for manholes, handholes, pull boxes, and other utility structures.
4. Warning tape.
5. Warning planks.

- B. Shop Drawings for Precast or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:

1. Duct entry provisions, including locations and duct sizes.
2. Reinforcement details.
3. Frame and cover design and manhole frame support rings.
4. Ladder and/or step details.
5. Grounding details.
6. Dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
7. Joint details.

- C. Shop Drawings for Factory-Fabricated Handholes and Pull Boxes Other Than Precast Concrete: Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:
 - 1. Duct entry provisions, including locations and duct sizes.
 - 2. Cover design.
 - 3. Grounding details.
 - 4. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
- D. Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.
 - 1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
 - 2. Drawings shall be signed and sealed by a qualified professional engineer.
- E. Product Certificates: For concrete and steel used in precast concrete manholes, pull boxes, and handholes, comply with ASTM C 858.
- F. Qualification Data: For qualified professional engineer and testing agency.
- G. Source quality-control reports.
- H. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Comply with IEEE C2.
- B. Comply with NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.
- B. Store precast concrete and other factory-fabricated underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.
- C. Lift and support precast concrete units only at designated lifting or supporting points.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Architect and Construction Manager no fewer than two (2) days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Architect's and Construction Manager's written permission.

1.8 COORDINATION

- A. Coordinate layout and installation of ducts, manholes, handholes, and pull boxes with final arrangement of other utilities, site grading, and surface features as determined in the field.
- B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and pull boxes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Architect.

1.9 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Furnish cable-support stanchions, arms, insulators, and associated fasteners in quantities equal to five percent (5%) of quantity of each item installed.

PART 2 - PRODUCTS

2.1 CONDUIT

- A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.
- B. RNC: NEMA TC 2, Type EPC-40-PVC and Type EPC-80-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.2 NONMETALLIC DUCTS AND DUCT ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. AFC Cable Systems
 2. ARNCO Corporation
 3. Beck Manufacturing
 4. Cantex, Inc.
 5. CertainTeed Corp.
 6. Condux International, Inc.
 7. DCX-CHOL Enterprises, Inc.; ELECSYS Division
 8. Electri-Flex Company
 9. IPEX Inc.

10. Lamson & Sessions; Carlon Electrical Products

11. Manhattan Wire Products; a Belden company

B. Underground Plastic Utilities Duct: NEMA TC 6 & 8, Type EB-20-PVC, ASTM F 512, UL 651A, with matching fittings by the same manufacturer as the duct, complying with NEMA TC 9.

C. Underground Plastic Utilities Duct: NEMA TC 6 & 8, Type DB-60-PVC and Type DB-120-PVC, ASTM F 512, with matching fittings by the same manufacturer as the duct, complying with NEMA TC 9.

D. Duct Accessories:

1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and retained to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.

2. Warning Tape: Underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

3. Concrete Warning Planks: Nominal 12 by 24 by 3 inches in size, manufactured from 6000-psi concrete.

a. Color: Red dye added to concrete during batching.

b. Mark each plank with "ELECTRIC" in 2-inch-high, 3/8-inch-deep letters.

2.3 PRECAST CONCRETE HANDHOLES AND PULL BOXES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Christy Concrete Products

2. Cretex Concrete Products West, Inc.; Riverton Division

3. Elmhurst-Chicago Stone Co.

4. Oldcastle Precast Group

5. Oldcastle Precast Inc.; Utility Vault Division

6. Utility Concrete Products, LLC

7. Wausau Tile Inc.

B. Comply with ASTM C 858 for design and manufacturing processes.

C. Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A 153 and ASTM A 123.

D. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or pull box.

1. Frame and Cover: Weatherproof steel frame, with hinged steel access door assembly with tamper-resistant, captive, cover-securing stainless-steel bolts.

a. Cover Hinges: Concealed, with hold-open ratchet assembly.

b. Cover Handle: Recessed.

2. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
3. Cover Legend: Molded lettering, "ELECTRIC.", "TELEPHONE.", and as indicated for each service.
4. Configuration: Units shall be designed for flush burial and have integral closed bottom unless otherwise indicated.
5. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
 - a. Extension shall provide increased depth of 12 inches.
 - b. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.
6. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches vertically and horizontally to accommodate alignment variations.
 - a. Windows shall be located no less than 6 inches from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
 - b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
 - c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.
7. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
 - a. Type and size shall match fittings to duct or conduit to be terminated.
 - b. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.
8. Handholes 12 inches wide by 24 inches long and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.4 HANDHOLES AND PULL BOXES OTHER THAN PRECAST CONCRETE

A. Description: Comply with SCTE 77.

1. Color: Gray.
2. Configuration: Units shall be designed for flush burial and have integral closed bottom unless otherwise indicated.
3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
5. Cover Legend: Molded lettering,
 - a. "ELECTRIC.", "TELEPHONE.", and as indicated for each service.
 - b. Tier level number, indicating that the unit complies with the structural load test for that tier according to SCTE 77.
6. Direct-Buried Wiring Entrance Provisions: Knockouts equipped with insulated bushings or end-bell fittings, retained to suit box material, sized for wiring indicated, and arranged for secure, fixed installation in enclosure wall.
7. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

8. Handholes 12 inches wide by 24 inches long and larger shall have factory-installed inserts for cable racks and pulling-in irons.
- B. Polymer Concrete Handholes and Pull Boxes with Polymer Concrete Cover: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two (2). Handholes and pull boxes shall comply with the requirements of SCTE 77 Tier 8 and Tier 15 loading.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armorcast Products Company
 - b. Carson Industries LLC
 - c. CDR Systems Corporation
 - d. Hubbell Power Systems; Lenoir City Division
 - e. NewBasis
- C. Fiberglass Handholes and Pull Boxes with Polymer Concrete Frame and Cover: Complying with SCTE 77 Tier 8 and Tier 15 loading. Sheet-molded, fiberglass-reinforced, polyester resin enclosure joined to polymer concrete top ring or frame.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armorcast Products Company
 - b. Carson Industries LLC
 - c. Christy Concrete Products
 - d. Synertech Moulded Products, Inc.; a division of Oldcastle Precast
- D. Fiberglass Handholes and Pull Boxes: Molded of fiberglass-reinforced polyester resin, with covers of polymer concrete, complying with SCTE 77 Tier 8 and Tier 5 loading.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carson Industries LLC
 - b. Christy Concrete Products
 - c. Nordic Fiberglass, Inc.
- E. High-Density Plastic Pull Boxes: Injection molded of high-density polyethylene or copolymer-polypropylene, complying with SCTE 77 Light Duty loading. Cover shall be polymer concrete.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carson Industries LLC
 - b. Nordic Fiberglass, Inc.

c. Pencil Plastics

2.5 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.
- B. Nonconcrete Handhole and Pull Box Prototype Test: Test prototypes of manholes and pull boxes for compliance with SCTE 77. Strength tests shall be for specified Tier ratings of products supplied.
 - 1. Testing Agency: Owner will engage a qualified testing agency to evaluate nonconcrete handholes and pull boxes.
 - 2. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate layout and installation of ducts, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.
- B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of ducts and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Architect.
- C. Clear and grub vegetation to be removed, and protect vegetation to remain according to Section 311000 "Site Clearing." Remove and stockpile topsoil for reapplication according to Section 311000 "Site Clearing."

3.2 CORROSION PROTECTION

- A. Aluminum shall not be installed in contact with earth or concrete.

3.3 UNDERGROUND DUCT APPLICATION

- A. Ducts for Electrical Cables over 600 V: RNC, NEMA Type EPC-40-PVC, in concrete-encased duct bank unless otherwise indicated.
- B. Ducts for Electrical Feeders 600 V and Less: RNC, NEMA Type EPC-40 PVC, in direct-buried duct bank unless otherwise indicated.
- C. Ducts for Electrical Branch Circuits: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank unless otherwise indicated.

- D. Underground Ducts for Telephone, Communications, or Data Circuits: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank unless otherwise indicated.
- E. Underground Ducts Crossing Driveways, and Roadways: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank unless otherwise indicated.

3.4 UNDERGROUND ENCLOSURE APPLICATION

- A. Handholes and Pull Boxes for 600 V and Less, Including Telephone, Communications, and Data Wiring:
 - 1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete. AASHTO HB 17, H-20 structural load rating.
 - 2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Polymer concrete, SCTE 77, Tier 15 or Tier 22 structural load rating.
 - 3. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: structural load rating.
 - 4. Units Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested according to SCTE 77 with 3000-lbf "Light-Duty" vertical loading.

3.5 EARTHWORK

- A. Excavation and Backfill: Comply with Section 312000 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.
- B. Restore surface features at areas disturbed by excavation and reestablish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary top soiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Cut and patch existing pavement in the path of underground ducts and utility structures.

3.6 DUCT INSTALLATION

- A. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two (2) manholes to drain in both directions.
- B. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 25 ft. both horizontally and vertically, at other locations unless otherwise indicated.
- C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.

- D. Duct Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch ducts, and vary proportionately for other duct sizes.
1. Begin change from regular spacing to end-bell spacing 10 ft. from the end bell without reducing duct line slope and without forming a trap in the line.
 2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole.
 3. Grout end bells into structure walls from both sides to provide watertight entrances.
- E. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 ft. outside the building wall without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified in Section 260500 "Common Work Results for Electrical."
- F. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.
- G. Pulling Cord: Install 100-lbf-test nylon cord in ducts, including spares.
- H. Concrete-Encased Ducts: Support ducts on duct separators.
1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than five (5) spacers per 20 ft. of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
 2. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.
 - a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.
 - b. If more than one (1) pour is necessary, terminate each pour in a vertical plane and install $\frac{3}{4}$ -inch reinforcing rod dowels extending 18 inches into concrete on both sides of joint near corners of envelope.
 3. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.
 4. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.

5. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
6. Minimum Space between Ducts: 3 inches between ducts and exterior envelope wall, 2 inches between ducts for like services, and 4 inches between power and signal ducts.
7. Depth: Install top of duct bank at least 24 inches below finished grade in areas not subject to deliberate traffic, and at least 30 inches below finished grade in deliberate traffic paths for vehicles unless otherwise indicated.
8. Stub-Ups: Use manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor unless otherwise indicated. Extend concrete encasement throughout the length of the elbow.
9. Stub-Ups: Use manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
 - b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.
10. Warning Tape: Bury warning tape approximately 12 inches above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches of the centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

I. Direct-Buried Duct Banks:

1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
2. Space separators close enough to prevent sagging and deforming of ducts, with not less than five (5) spacers per 20 ft. of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches between tiers.
3. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Section 312000 "Earth Moving" for pipes less than 6 inches in nominal diameter.
4. Install backfill as specified in Section 312000 "Earth Moving."
5. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand-place backfill to 4 inches over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
6. Install ducts with a minimum of 3 inches between ducts for like services and 6 inches between power and signal ducts.
7. Depth: Install top of duct bank at least 36 inches below finished grade unless otherwise indicated.
8. Set elevation of bottom of duct bank below the frost line.

9. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
10. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
 - b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
11. Warning Planks: Bury warning planks approximately 12 inches above direct-buried ducts and duct banks, placing them 24 inches o.c. Align planks along the width and along the centerline of duct bank. Provide an additional plank for each 12-inch increment of duct bank width over a nominal 18 inches. Space additional planks 12 inches apart, horizontally.

3.7 INSTALLATION OF HANDHOLES AND PULL BOXES OTHER THAN PRECAST CONCRETE

- A. Install handholes and pull boxes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use pull box extension if required to match depths of ducts, and seal joint between box and extension as recommended by the manufacturer.
- B. Unless otherwise indicated, support units on a level 6-inch-thick bed of crushed stone or gravel, graded from ½-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: Set so cover surface will be flush with finished grade.
- D. Install handholes and pull boxes with bottom below the frost line, below grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Retain arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.
- F. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.
- G. For enclosures installed in asphalt paving and subject to occasional, nondeliberate, heavy-vehicle loading, form and pour a concrete ring encircling, and in contact with, enclosure and with top surface screeded to top of box cover frame. Bottom of ring shall rest on compacted earth.
 1. Concrete: 3000 psi, twenty-eight (28) day strength, complying with Section 033000 "Cast-in-Place Concrete," with a troweled finish.
 2. Dimensions: 10 inches wide by 12 inches deep.

3.8 GROUNDING

- A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.9 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
 - 2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to eighty percent (80%) fill of duct. If obstructions are indicated, remove obstructions and retest.
 - 3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Correct deficiencies and retest as specified above to demonstrate compliance.
- C. Prepare test and inspection reports.

3.10 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
- B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION 26 05 43

5660-02-a2516-specs-260543 - underground ducts and raceways for electrical systems

SECTION 26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels.
 - 8. Miscellaneous identification products.

1.3 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Colors for Raceways Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch-high letters on 20-inch centers.
- D. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- E. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- G. Tape and Stencil for Raceways Carrying Circuits More Than 600 V: 4-inch-wide black stripes on 10-inch centers diagonally over orange background that extends full length of raceway or duct and is 12 inches wide. Stop stripes at legends.

- H. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- I. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- D. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.
- E. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.3 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

- D. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- F. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.4 UNDERGROUND-LINE WARNING TAPE

A. Tape:

- 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
- 2. Printing on tape shall be permanent and shall not be damaged by burial operations.
- 3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

- 1. Comply with ANSI Z535.1 through ANSI Z535.5.
- 2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.
- 3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

C. Tag: Type ID:

- 1. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
- 2. Overall Thickness: 5 mils.
- 3. Foil Core Thickness: 0.35 mil.
- 4. Weight: 28 lb/1000 sq. ft.
- 5. 3-Inch Tensile According to ASTM D 882: 70 lbf, and 4600 psi.

2.5 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. ¼-inch grommets in corners for mounting.
3. Nominal size, 7 by 10 inches.

D. Metal-Backed, Butyrate Warning Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
2. ¼-inch grommets in corners for mounting.
3. Nominal size, 10 by 14 inches.

E. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.6 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.

C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.7 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

- D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- E. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

2.8 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi.
 - 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
 - 4. Color: Black except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi.
 - 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
 - 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 7000 psi.
 - 3. UL 94 Flame Rating: 94V-0.
 - 4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
 - 5. Color: Black.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.

- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

3.2 IDENTIFICATION SCHEDULE

- A. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil 4-inch-wide black stripes on 10-inch centers over orange background that extends full length of raceway or duct and is 12 inches wide. Stencil legend "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch-high black letters on 20-inch centers. Stop stripes at legends. Apply to the following finished surfaces:
 - 1. Floor surface directly above conduits running beneath and within 12 inches of a floor that is in contact with earth or is framed above unexcavated space.
 - 2. Wall surfaces directly external to raceways concealed within wall.
 - 3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.
- B. Accessible Raceways, Armored and Metal-Clad Cables, More Than 600 V: Self-adhesive vinyl labels. Install labels at 30-foot maximum intervals.
- C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label. Install labels at 30-foot maximum intervals.
- D. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

1. Emergency Power.
 2. Power.
 3. UPS.
- E. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two (2) turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- F. Power-Circuit Conductor Identification, More than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use write-on tags, nonmetallic plastic tag holder with adhesive-backed phase tags, and a separate tag with the circuit designation.
- G. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- H. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.
- I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- J. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
1. Limit use of underground-line warning tape to direct-buried cables.
 2. Install underground-line warning tape for both direct-buried cables and cables in raceway.

- K. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- L. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
 - 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
- M. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- N. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer and load shedding.
- O. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
 - 1. Labeling Instructions:
 - a. Indoor Equipment: Adhesive film label. Unless otherwise indicated, provide a single line of text with ½-inch-high letters on 1½-inch-high label; where two (2) lines of text are required, use labels 2 inches (high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label. Stenciled legend 4 inches high.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 - 2. Equipment to Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be self-adhesive and engraved laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Access doors and panels for concealed electrical items.

- d. Switchgear.
- e. Switchboards.
- f. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- g. Substations.
- h. Emergency system boxes and enclosures.
- i. Motor-control centers.
- j. Enclosed switches.
- k. Enclosed circuit breakers.
- l. Enclosed controllers.
- m. Variable-speed controllers.
- n. Push-button stations.
- o. Power transfer equipment.
- p. Contactors.
- q. Remote-controlled switches, dimmer modules, and control devices.
- r. Battery-inverter units.
- s. Battery racks.
- t. Power-generating units.
- u. Monitoring and control equipment.
- v. UPS equipment.

END OF SECTION 26 05 53

5660-02-a2516-specs-260553 - identification for electrical systems

BID ALTERNATE NO. 3

SECTION 26 56 68 EXTERIOR ATHLETIC LIGHTING

PART 1 – GENERAL

1.1 SUMMARY

- A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- B. The purpose of these specifications is to define the performance and design standards for Masuk High School. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.
- C. Scope of Work- Furnish and install four new 80' base plate poles & foundations with new fixtures, crossarms, ballasts wiring harnesses and associated hardware.
- D. The sports lighting will be for the Multi-Use Field
- E. The primary goals of this sports lighting project are:
 - 1. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore light levels are guaranteed to not drop below specified target values for a period of 25 years. Life-cycle Cost: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated.
 - 2. Control and Monitoring: To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system including all costs to monitor for 25 years. Fields should be proactively monitored to detect fixture outages over a 25-year life cycle. All communication costs shall be included in the bid.
 - 3. Environmental Light Control: It is the primary goal of this project to minimize spill light and glare to the players, spectators and adjoining properties

1.2 LIGHTING PERFORMANCE

- A. Performance Requirements: Playing surfaces shall be lit to an average target light level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Average illumination level shall be measured in accordance with the IESNA LM-5-04. Light levels shall be guaranteed not to drop below desired target values from the first 100 hours of operation for the maximum warranty period of 25 years or 10,000 hours.
- B. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be 80. Ensure the top of the beam angle is a minimum of 10 degrees below horizontal.

C. Lighting Methodology: There are two methods that will be considered for calculation of the lighting designs for this project. The approved Lighting Method #1, automated timed power adjustments, as described in C.1 utilizes methodology that adjusts light levels through a series of programmed adjustments. The alternate Lighting Method #2, straight depreciation, as described in C.2 uses continuous lamp lumen depreciation which is recovered by relamping and cleaning lenses of the luminaires. Both methods must be at or above target light values throughout the 25 years of the contract/warranty provided by the manufacturer. Scans shall reflect initial design lumens, end of life design lumens, recoverable light loss factor (RLLF), and the Coefficient Utilization (CU) for the design. A +/- 10% design/testing allowance is not acceptable.

1. Lighting Method #1: Automated Timed Power Adjustments:

- a. The lighting system shall use automated timed power adjustments to achieve a lumen maintenance control strategy as described in the IESNA Lighting Handbook 10th Edition, Lighting Controls Section page 16-8: "Lumen maintenance involves adjusting lamp output over time to maintain constant light output as lamps age and dirt accumulation reduces luminaire output. With lumen maintenance control, either lamps are dimmed when new, or the lamp's current is increased as the system ages."
- b. Independent Test Report: If lamp replacement interval is greater than 3,000 hours, manufacturer shall supply an independent test report with applicable recoverable light loss factors. Manufacturers bidding an automated timed power adjustment system must provide an independent test report certifying the system meets the lumen maintenance control strategy above and verifying the field performance of the system for the duration of the useful life of the lamp based on lamp replacement hours. Report shall be signed by a licensed professional engineer with outdoor lighting experience. If report is not provided at least 10 days prior to bid opening, the manufacturer shall provide the initial and maintained designs called for in this specification under Lighting Method #2: Alternate Manufacturers, section 1.2.C.2.
- c. Project References: Manufacturers bidding any form of Automated Timed Power Adjustment light system must provide a minimum of 10 project references within the state of Connecticut that have been completed within the last 12 months utilizing this exact technology. Manufacturer will include project name, project city, and if requested, contact name and contact phone number for each reference.

| Area of Lighting | Average Target Light Levels | Maximum to Minimum Uniformity Ratio | Grid Points | Grid Spacing |
|------------------|-----------------------------|-------------------------------------|-------------|--------------|
| Football/Soccer | 50 footcandles | 2.0:1.0 | 84 | 30' x 30' |

2. Lighting Method #2 – Straight Depreciation

- a. Light Level Requirements: Manufacturer shall provide computer models and guarantee target light levels on the field over 25 years. The specified maximum Recoverable Light Loss Factor of 0.65 and maintenance/group relamping schedule shall be provided in accordance with recommendations in the Leukos Abstract Volume 6, Number 3, January 2010, page 183-201: "Light Loss Factors for Sports Lighting", and presented at the 2009 IESNA Annual Conference.

For Lighting Method #2, scans for both initial and target light levels are required.

1500w Fixture RLLF Requirements

| | |
|-----------------------------------|--------------------------------------|
| Lamp Replacement Interval (hours) | Recoverable Light Loss Factor (RLLF) |
| 3000 | .65 |

- b. Based on anticipated hours of usage (200 hours per year), Option #2 systems would require a minimum of 2 group lamp replacements over the 25 years. Data would reflect the actual RLLF adopted by the designer

| Area of Lighting | Average Initial Light Levels | Average Target Light Levels | Maximum to Minimum Uniformity Ratio | Grid Points | Grid Spacing |
|-----------------------|------------------------------|-----------------------------|-------------------------------------|-------------|--------------|
| Football/Soccer Field | 76.9 footcandles | 50 footcandles | 2.0:1.0 | 84 | 30' x 30' |

- c. Revised Electrical Distribution: Manufacturer shall provide revised electrical distribution plans to include changes to service entrance, panel, and wire sizing if exceed specified design loads.

1.3 LIFE CYCLE ENERGY COSTS

25 Year Life Energy Cost: Manufacturer shall submit 25-year life energy cost calculations as follows. If lamp replacement interval is greater than 3000 hours, manufacturer shall supply an independent test report with applicable recoverable light loss factors.

Lamp replacement schedule per charts below:

| | | Lighting Method 1 | Lighting Method 2 |
|----|--|-------------------|-------------------|
| a. | Luminaire energy consumption 58 luminaires x 1.56 kW demand per luminaire x .16 kWh rate x 200 annual usage hours x 25 years | | |
| b. | Demand charges, if applicable | + | |
| | TOTAL 25 -Year Life Energy Operating Cost | = | |

| | |
|------------------------------------|------------------------------------|
| Lighting Method 1 Lamp Replacement | Lighting Method 2 Lamp Replacement |
| 5,000 hour intervals | 3,000 hour intervals |

PART 2 – PRODUCT

2.1 SPORTS LIGHTING SYSTEM CONSTRUCTION

- A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, ballast and other enclosures shall be factory assembled, aimed, wired and tested.
- B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel of 18-8 grade or better, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the crossarms, pole, or electrical components enclosure.
- C. System Description: Lighting system shall consist of the following:
1. 2- 100' Galvanized steel base plate poles and crossarm assembly.
 2. New crossarms and fixtures for existing poles F3 and F4.
 3. Non-approved pole technology. Square static cast poles will not be accepted. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
 4. Pre-stressed concrete base embedded in concrete backfill allowed to cure for 12-24 hours before pole stress is applied. Alternate may be an anchor bolt foundation designed such that the steel pole and any exposed steel portion of the foundation is located a minimum of 18 inches above final grade. The concrete for anchor bolt foundations shall be allowed to cure for a minimum of 28 days before the pole stress is applied.
 5. All luminaires shall be constructed with a die-cast aluminum housing or external hail shroud to protect the luminaire reflector system.
 6. Manufacturer will remote all ballasts and supporting electrical equipment in aluminum enclosures mounted approximately 10' above grade. The enclosures shall be touch-safe and include ballast, capacitor and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Safety disconnect per circuit for each pole structure will be located in the enclosure. Integral ballast fixtures will not be accepted.
 7. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
 8. Controls and Monitoring Cabinet to provide on-off control and monitoring of the lighting system constructed of NEMA Type 4 aluminum. Communication method shall be provided by manufacturer. Cabinet shall contain custom configured contactor modules for 30, 60, and 100 amps, labeled to match field diagrams and electrical design. Manual Off-On-Auto selector switches shall be provided.

9. Lightning Protection: Manufacturer shall provide integrated lightning grounding via concrete encased electrode grounding system as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A. If grounding is not integrated into the structure, the Manufacturer shall supply grounding electrodes, copper down conductors and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be not less than 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.

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

2.2 ELECTRICAL

A. Electric Power Requirements for the Sports Lighting Equipment:

1. Electric power: 208 Volt, 3 Phase
2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

B. Energy Consumption: The average kW consumption for the field lighting system shall be 82 kW for metal halide fixtures in Lighting Method 1. Lighting Method 2 kW will be defined in Life Cycle calculation chart (1.3) using a RLLF of .65.

C. Revised Electrical Distribution: Manufacturer shall provide, at their cost, revised electrical distribution plans to include changes to service entrance, panel, and wire sizing if using Lighting Method 2.

2.3 STRUCTURAL PARAMETERS

A. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, the minimum pole mounting heights from the playing field surface shall be as noted in Section 1.2.B. Higher mounting heights may be required based on photometric performance of manufacturer's luminaires to meet spill and glare requirements.

B. Support Structure Wind Load Strength: Poles and other support structures, brackets, arms, bases, anchorages and foundations shall be determined based on the IBC Building Code, wind speed of 110, exposure category C. Luminaire, visor, and crossarm shall withstand 150mph winds and maintain luminaire aiming alignment.

C. Structural Design: The stress analysis and safety factor of the poles shall conform to AASHTO, Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

D. Soil Conditions: The design criteria for these specifications are based on soil design parameters as outlined in the geotechnical report. If a geotechnical report is not provided by the owner, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by IBC.

It shall be the contractor's responsibility to notify the owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the owner's approval / payment for additional costs associated with:

1. Providing engineered foundation embedment design by a registered engineer in the State of Connecticut.
 2. Additional materials required to achieve alternate foundation.
 3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.
- E. Foundation Drawings: Project specific foundation drawings stamped by a registered engineer in the state where the project is located are required. The foundation drawings must list the moment, shear (horizontal) force, and axial (vertical) force at ground level for each pole. These drawings must be submitted at time of bid to allow for accurate pricing.

2.4 CONTROLS AND MONITORING

- A. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The manufacturer shall notify the owner of outages within 24 hours, or the next business day. The controller shall determine switch position (Manual or Auto) and contactor status (open or closed)
- B. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

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

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

- C. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of lamp outages, control operation and service scheduling including relamping operations completed and scheduled.

Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.

1. Cumulative hours: shall be tracked to show the total hours used by the facility
2. Current lamp hours: shall be tracked separately to reflect the amount of hours on the current set of lamps being used, so relamping can be scheduled accurately.

- D. Communication Costs: Manufacturer shall include communication costs for operating the controls and monitoring system for a period of 25 years.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Delivery Timing Equipment On-Site: The equipment must be on-site 4-6 weeks from receipt of approved submittals and receipt of complete order information.
- B. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04. For Lighting Method 1, Timed Power Adjustment systems, light levels must be measured and exceed the specified target levels. For Lighting Method 2, light levels must be measured and meet the specified initial light levels.
- C. Field Light Level Accountability
 1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 Years.
 2. The contractor/manufacturer shall be responsible for an additional inspection one year from the date of commissioning of the lighting system and will utilize the owner's light meter in the presence of the owner.
 3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.
- D. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including foot-candles, uniformity ratios, and maximum kilowatt consumptions are not in conformance with the requirements of the performance specifications and submitted information, the manufacturer shall be liable to any or all of the following:
 1. Manufacturer shall at his expense provide and install any necessary additional fixtures to meet the minimum lighting standards. The Manufacturer shall also either replace the existing poles to meet the new wind load (EPA) requirements or verify by certification by a licensed structural engineer that the existing poles will withstand the additional wind load.
 2. Manufacturer shall minimize the Owner's additional long term fixture maintenance and energy consumption costs created by the additional fixtures by reimbursing the Owner the amount of \$1,000.00 (one thousand dollars) for each additional fixture required.
 3. Manufacturer shall remove the entire unacceptable lighting system and install a new lighting system to meet the specifications

3.2 25 YEAR WARRANTY

- A. Each manufacturer shall supply a signed warranty covering the entire system for 25 years or for the maximum hours of coverage based on the estimated annual usage, whichever occurs first.

Warranty shall guarantee that the average light levels will not fall below target levels; lamp replacements; system energy consumption; monitoring, maintenance and control services, spill light control, and structural integrity. Manufacturer shall maintain specifically funded financial reserves to assure fulfillment of the warranty for the full term. Warranty may exclude fuses, storm damage, vandalism, abuse and unauthorized repairs or alterations.

- B. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance, including parts and labor for 25 years from the date of equipment shipment. Individual lamp outages shall be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

3.3 PRE-BID SUBMITTAL REQUIREMENTS

- A. Approved Product: Musco’s Green Generation Lighting® sports lighting system is the approved “Lighting Method 1” product. All submittal information at the end of this section must be submitted at least 10 days prior to bid for any alternates using Method #1 or any manufacture using Method #2. An addendum will be issued prior to bid, listing any approved alternate lighting manufacturers and the design method to be used.
- B. Design Approval: The owner / engineer will review pre-bid submittals per section 3.3.A from all the manufacturers to ensure compliance to the specification. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.
- C. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner’s representative. Bids received that do not utilize an approved system/design, will be rejected.

REQUIRED SUBMITTAL INFORMATION ANY ALTERNATE MANUFACTURERS 10 DAYS PRIOR TO BID

All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements

| Tab | Item | Description |
|-----|--------------------------|--|
| A | Letter/ Checklist | Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer’s local representative and his/her phone number. Signed submittal checklist to be included. |
| B | Equipment Layout | Drawing(s) showing field layouts with pole locations |
| C | On Field Lighting Design | Lighting design drawing(s) showing: <ul style="list-style-type: none"> a. Field Name, date, file number, prepared by b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, as well as luminaire information including wattage, lumens and optics d. Height of light test meter above field surface. |

| | | |
|---|-------------------------------|--|
| | | <p>e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor.</p> <p>f. Manufacturer's using Lighting Method 2 shall provide both initial and maintained light scans using a maximum Recoverable Light Loss Factor (RLLF) as specified in section 1.2.C.2</p> |
| D | Off Field Lighting Design | Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights. |
| E | Structural Calculations | Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of Connecticut, if required by owner. (May be supplied upon award). |
| F | Control & Monitoring System | Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system to include monitoring. They will also provide ten (10) references currently using proposed system in the state of Connecticut. |
| G | Electrical Distribution Plans | Manufacturer using Lighting Method 2 must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed by a licensed Electrical Engineer in the state of Connecticut. |
| H | Warranty | Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of Connecticut. |
| I | Independent Testing Report | <p>a. Lighting Method 1 is to provide an independent test report certifying the system meets the lumen maintenance control strategy defined in Section 1.2.C.1.a, verifying the field performance of the system for the duration of the useful life of the lamp based on lamp replacement hours. Report shall be signed by a licensed professional engineer with outdoor lighting experience.</p> <p>b. If Manufacturer using Lighting Method 2 desires to provide a recoverable light loss factor other than specified in section 1.2.C.2, Independent field test report from licensed professional engineer will be required to substantiate the ability to maintain light levels in accordance with section 1.7-A of the specification. Both initial and maintained light scans must still be provided. Independent Engineer conducting the report must have no affiliation with the manufacturer and report must be based on actual testing data. Testing must be done on the system as a whole, not on individual components.</p> |
| J | Project References | Manufacturer to provide a list of 10 projects where the technology and specific fixture proposed for this project has been installed in the state of Connecticut. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number. Manufacturer bidding Lighting Method 2 must supply independent test report if lamp life relamping projection is greater than 3000 hours. |
| K | Product Information | Complete bill of material for all product being provided. |
| L | Non-Compliance | Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted. |

| | | |
|---|-----------------------------|--|
| M | Life-cycle Cost Calculation | Document life-cycle cost calculations as defined in the specification. Identify energy costs for operating the luminaires, maintenance cost for the system including spot lamp replacement, and group relamping costs. All costs should be based on 25 Years. (complete table below) |
|---|-----------------------------|--|

| | | | Lighting Method 1 | Lighting Method 2 |
|----|--|---|-------------------|-------------------|
| a. | Luminaire energy consumption 52 luminaires x 1.56kW demand per luminaire x .16 kWh rate x # annual usage hours x 25 years | | | |
| b. | Demand charges, if applicable | + | | |
| c. | Cost for spot relamping and maintenance over 25 years Assume 7.5 repairs at \$500 each if not included with the bid | + | | |
| d. | Cost to relamp all luminaires during 25 years # annual usage hours x 25 years / 3000 hours x \$125 lamp & labor x fixtures if not included with the bid | + | | |
| e. | Extra energy used without base bid automated control system \$ Energy consumption in item a. x 10% if control system not included with the bid | + | | |
| | TOTAL 25 -Year Life-cycle Operating Cost | = | | |

The information supplied herein shall be used for the purpose of complying with the specifications for Masuk High School. By signing below I agree that all requirements of the specifications have been met and that the manufacturer will be responsible for any future costs incurred to bring their equipment into compliance for all items not meeting specifications and not listed in the Non-Compliance section.

Manufacturer: _____

Signature: _____

Contact Name: _____

Date: ____/____/____

END OF SECTION 26 56 68

5660-02-a2516-specs-265668 - exterior athletic lighting

BID ALTERNATE NO. 2

SECTION 27 51 16 PUBLIC ADDRESS SYSTEM

PART 1 – GENERAL

1.1 SUMMARY

A. Work Included: design, engineering, labor, material and products, equipment warranty and system warranty, training and services for:

1. Outdoor Public Address (PA) System

B. Related sections include the following:

1. NA

1.2 SUBMITTALS

A. Provide Shop Drawings: Contractor shall provide manufacturer's shop drawings detailing specific product and conforming mounting system.

1.3 QUALITY ASSURANCE

A. All materials and construction methods shall conform to Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction", 2004 edition including supplements, unless otherwise specified herein.

PART 2 – PRODUCTS

2.1 PUBLIC ADDRESS SYSTEM

A. The public address system shall include:

1. Qty: 4 – COMMUNITY R2-52Z – Community Speaker 2x12" weather resistant 3-way 800W to 1200W at 4 ohms per loudspeaker (136 lbs each).
2. Qty: 1 – COMMUNITY DSPEC226 – Community DSP 2 analog in x 6 analog out speaker.
3. Qty: 1 – WEST PENN C210-2000 – West Penn 10GA twisted speaker cable, 2000 lf, 400' per speaker – Approved for direct burial and outdoor use. Spool.
4. Qty: 2 – CROWN XTI4002 – Crown amplifier – 2 x 1200W at 4 ohms, 2 x 1,600W at 2 ohms amp for R2-52Z.
5. Qty: 2 – COMMUNITY – R.5COAX99 – Community Full-Range 2-way 12-inch coax 90x90 grey, recommended power amplifier: 420W to 600W at 8 ohms / for concession area. 90x90 dispersion. 42 lbs each.
6. Qty: 1 – DENON DN-300Z – Denon media player with Bluetooth receiver and am/fm.
7. Qty: 1 – ALESIS MULTIMIX10-WIRELESS – Alesis rackmount mixer 10-ch w. Bluetooth wireless
8. Qty: 1 – GATOR GRW2018508 – Gator rack, 18U, 21" deep, sectional wall mounted, steel.
9. Qty: 1 – FURMAN PL-8C – Furman power conditioner 15A, 9-outlets, BNC.

BID ALTERNATE NO. 2

10. Qty: 1 – SENNHEISER E835S – Sennheiser handheld cardioid dynamic with on/off
11. Qty: 1 – SHURE QLXD124/85-G50 – Shure QLX-D bodypack and vocal combo system (470-534).
12. Qty: 1 – HOSA HMIC-025 – Hosa pro microphone cable, rean XLR3F to XLR3M, 25 ft.
13. Qty: 1 – HOSA HMIC-005 - Hosa pro microphone cable, rean XLR3F to XLR3M, 5 ft, QLXD → Mixer.
14. Qty: 2 – HOSA STX-102F – Hosa cable ¼” TRS – XLR3F, 2 ft. DN-300z → Mixer.
15. Qty: 1 – COMMUNITY PMB-1RR – Community pole mount bracket, single loudspeaker for concession area.
16. Qty: 1 – COMMUNITY PMB-2RR - Community dual speaker pole mount assembly, for concession area.
17. Qty: 2 – HOSA HSS-003 – Hosa pro balanced interconnect, rean ¼ in TRS to mixer → DSPEC (cut and strip one end for spec)
18. Qty: 6 – HOSA HMIC-005 – Hosa pro microphone cable, rean XLR3F to XLR3M, 5 ft, DPEC → XTI AMPS (cut and strip one end for spec)
19. Qty: (400 ft) – WEST PENN C210-1 – West Penn wire 10ga twisted speaker cable. 400’ per speaker – approved for direct burial and outdoor use. Smaller spool.

B. Provided by:

All Pro Sound
806 Beverly Parkway
Pensacola, FL 32505
850-432-5780

Or Approved Equal.

PART 3 – EXECUTION

3.1 INSTALLATION - GENERAL

- A. All work shall be constructed as shown on the plans and as recommended per the manufacturers' specifications

3.2 CLEANING

- A. Clean up debris and unused material, and remove from the site.

END OF SECTION 27 51 16

5660-02-a2516-specs-275116 public address system

SECTION 31 10 00 SITE PREPARATION

PART 1 – GENERAL

1.1 SUMMARY

- A. Work shall include all materials, labor and equipment to prepare the site for construction including but not limited to the following:
 - 1. Protecting existing trees, plants and grass to remain
 - 2. Mobilization
 - 3. Construction staking/survey
 - 4. Stripping and stockpiling topsoil
 - 5. Removing above- and below-grade site improvements
 - 6. Disconnecting and capping or sealing site utilities
 - 7. Construction fencing
 - 8. Temporary utility service
 - 9. Repair of damaged items to remain.
 - 10. Tree Protection

1.2 MATERIAL OWNERSHIP

- A. Except for materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site in a legal manner.

1.3 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Existing access driveway to be maintained during construction. Alternate access drive to be provided during construction of primary access road.
 - 3. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- D. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 CONSTRUCTION STAKING

- A. Provide all necessary construction staking for the proper layout and satisfactory completion of all the work on the project.

3.3 TREE PROTECTION (IF REQUIRED)

- A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.
- B. Do not excavate within tree protection zones, unless otherwise indicated.
- C. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Engineer.

3.4 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
 - 1. Arrange with utility companies to shut off indicated utilities.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.

3.5 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.

- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3.6 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

3.7 EXISTING IRRIGATION SYSTEM

- A. The Contractor shall coordinate with the Town prior to the removal of the existing irrigation system within the contract limits. Removal shall be done in such a manner that the existing irrigation system to remain in areas outside the limits of proposed improvements may remain fully functional throughout the duration of the project.

3.8 DISPOSAL

- A. Disposal: Remove surplus soil material, topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 10 00

5660-02-a2516-specs-311000 site preparation

SECTION 31 20 00 EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Work shall include all materials, labor and equipment to complete all earth moving operations including but not limited to the following:
 - 1. Preparing subgrade for stone base placement, walks, pavements, lawns and grasses
 - 2. Excavating and backfilling for structures
 - 3. Processed aggregate base for walks
 - 4. Processed aggregate base for bituminous concrete pavements, pads, etc.
 - 5. Subbase for bituminous concrete pavement, curbing
 - 6. Excavating and backfilling for utility trenches and storm drainage structures
 - 7. Sand for long jump sand pits

- B. Related Sections
 - 1. Section 32 12 16 Bituminous Concrete Paving
 - 2. Section 32 13 13 Concrete Paving and Curbing
 - 3. Section 33 41 00 Storm Utility Drainage Piping

1.2 DEFINITIONS

- A. Fill: General term for soil materials used to raise existing grades.

- B. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect.
 - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

- C. Backfill: General term used for soil material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed over excavated subgrade, beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.

- D. Base Course: Course placed between the subbase course and hot-mix asphalt/bituminous concrete paving.

- E. Bedding Course: Initial Backfill placed over the excavated subgrade in a trench before laying pipe.

- F. Sand and Gravel: Fill placed over the excavated subgrade before placing crushed stone slab-on-grade base course.
- G. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- H. Ordinary Fill: General fill and backfill placed outside the limits of Structural Fill, Sand and Gravel, and Crushed Stone.
- I. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt/bituminous concrete pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt/bituminous concrete walk.
- J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- K. Proof-roll: The application of compactive energy to subgrade for the geotechnical engineer's evaluation of suitability of subgrade for bearing.
- L. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- M. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- N. Long Jump Pit Sand: USGA grade sand meeting the following gradations:

| Sieve Size | Percent Passing By Weight |
|------------|---------------------------|
| #16 | 100 |
| #20 | 95-100 |
| #30 | 85-95 |
| #40 | 45-85 |
| #50 | 25-45 |
| #70 | 2-20 |
| #100 | 0-2 |

1.3 PROJECT CONDITIONS

- A. Visit the site to review all details of the work and working conditions and to verify dimensions in the field including headroom and interferences from adjacent structures. Notify the Architect in writing of any discrepancy before performing any work.
- B. Consult official records of existing utilities, both surface and subsurface, and their connection to be fully informed on all existing conditions and limitations as they apply to this work and its relation to other construction work.

- C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.
- D. Verify that survey benchmark and intended elevations for work are as indicated.

1.4 QUALITY ASSURANCE

- A. Workmen: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition with supplements shall be used for material compliance and execution of the work in this section.
- C. Testing and Inspection: Owner shall employ and pay for a qualified independent laboratory to perform testing and inspection service required by these specifications and in compliance with the specifications outlined in the Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004.
- D. 2005 Connecticut State Building Code with amendments.

1.5 SUBMITTALS

- A. Product data including but not limited to sieve test, abrasion, hardness, proctor, percentage of recycled content, source of material for all materials.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations. Materials shall be free from ice, snow, roots, sod, rubbish or other deleterious or organic matter and shall conform to the gradations specified for each soil material.
- B. Base Course: Course placed between the subbase and hot mix asphalt per CT DOT Form 816 M.05.01 modified as follows:
 - 1. Under Section M.05, 2. Coarse Aggregate, delete the phrase "the coarse aggregate shall not have a loss of more than 50%" and substitute the phrase "the coarse aggregate shall not have a loss of more than 40%".
 - 2. Maximum aggregate size shall not exceed 1-1/2 inches.
- C. Subbase Course: Course placed between the subgrade and base course per CT DOT Form 816 M.02.02 Grading "A" and section M.02.06.04 Soundness.

- D. Ordinary Fill: General fill and backfill placed outside the limits of Structural Fill, Sand-Gravel, and Crushed Stone. Ordinary Fill shall be friable soil, free of rubbish, ice, snow, tree stumps, roots, and other organic matter; no stone greater than two thirds loose lift thickness.
- E. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe. Bedding Course shall consist of Sand free of silt, clay, loam, and organic matter. Bedding material shall pass a 3/8" sieve, with not more than 10% passing a No. 200 sieve
- F. Crushed Stone:

| Sieve Size | Percent Passing by Weight |
|------------|---------------------------|
| 1-inch | 100 |
| 3/4-inch | 90 - 100 |
| 1/2-inch | 10 - 50 |
| 3/8-inch | 0 - 20 |
| No. 4 | 0 - 5 |

- G. Sand and Gravel:

| Sieve Size | Percent Passing by Weight |
|------------|---------------------------|
| 4" | 100 |
| No. 4 | 50 - 85 |
| No. 10 | 40 - 75 |
| No. 40 | 10 - 35 |
| No. 200 | 0 - 8 |

- H. Structural Fill:

| Sieve Size | Percent Passing by Weight |
|--|---------------------------|
| 2/3 of loose lift thickness (8" maximum) | 100 |
| No. 10 | 30 - 95 |
| No. 40 | 10 - 70 |
| No. 200 | 0 - 15 |

2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify and flag structures, utilities, sidewalks, pavements, and other facilities and protect from damage caused by settlement, lateral movement, undermining, washout, and other hazards

created by earthwork operations. Maintain and protect existing utilities remaining which pass through work area.

- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface.
- C. Protect and maintain erosion and sedimentation controls.

3.2 EXCAVATION FOR SITE

- A. Classified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered within a tolerance of plus or minus 1 inch. Classified excavated materials may include rock and obstructions. Classified surface and subsurface conditions when encountered, and as defined in Section 12000 Contract Considerations, Part 1.5, shall be measured and compensated as described therein.

- 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.3 EXCAVATION FOR STRUCTURES

- A. Unclassified Excavation: Excavate to required elevations and dimensions regardless of the character of surface and subsurface conditions encountered within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

3.6 SUBGRADE EVALUATION

- A. Proof-roll subgrade with 10 passes of a vibratory drum roller weighing at least 10,000 pounds at the drum or other approved equipment to identify soft pockets and areas of excess yielding. Soft pockets and zones of yielding shall be excavated and proof-rolled again. Do not proof-roll wet or saturated subgrades.

- B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation or change in Contract Time.
- C. Prior to the commencement of subgrade preparation, the Engineer shall be notified of any potential unsuitable soil conditions and a determination made as to the acceptable nature of the subgrade soils.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect, without additional compensation or change in Contract Time.
- B. Fill unauthorized excavations under other construction or utility pipe as directed by Architect, without additional compensation or change in Contract Time.

3.8 STORAGE OF SOIL MATERIALS AND PROTECTION OF SUBGRADE

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust and for protection from precipitation
- B. Dewater to maintain water at least two feet below bottom of all excavations.
- C. Protect all subgrade soils. Excavate disturbed subgrade and backfill in accordance with specifications at Contractor's expense.
- D. Excavate soil and all other materials required to accommodate building foundations, slabs, paving and site structures, and construction operations.
- E. Do not excavate to full depth when freezing temperatures may be expected unless subgrade is protected from freezing or footings or slabs can be placed immediately after excavation is completed and are protected from freezing.
- F. Maintain safe and stable banks.
- G. Excavate in a manner that will not disturb existing foundations. Plans for excavating near existing foundations shall be submitted to the Architect for approval prior to beginning such excavation.
- H. Correct unauthorized excavations at no additional cost to the Owner or change in Contract Time.
- I. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.
 - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- D. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- E. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials as indicated on the plans and as specified in Form 816. Compaction shall be performed in accordance with the following:

Minimum compaction for fill and backfill, based on percentage of maximum dry density (as determined by ASTM D1557 or AASHTO T-180 (Modified Proctor)), is:

| | | |
|------------------------|---|-----|
| Below Structures | - | 95% |
| Behind Retaining Walls | - | 92% |
| Pavement Base/Subbase | - | 95% |
| Below Pavement Subbase | - | 95% |

Loose lift thickness for Fill and Backfill and the minimum number of passes of compaction equipment are summarized on the following table:

| Compaction Method | Maximum Stone Size | Maximum Loose Lift Thickness | | Minimum Number of Passes | |
|--|--------------------|-------------------------------|---------------------|-------------------------------|---------------------|
| | | Below Structures and Pavement | Less Critical Areas | Below Structures and Pavement | Less Critical Areas |
| Hand-operated vibratory plate or light roller in confined areas | 4" | 6" | 8" | 6 | 4 |
| Hand-operated vibratory drum rollers weighing at least 1,000# | 6" | 8" | 10" | 6 | 4 |
| Light vibratory drum roller, minimum dynamic force 3,000# per ft. of drum width | 6" | 10" | 14" | 6 | 4 |
| Medium vibratory drum roller, minimum dynamic force 5,000# per ft. of drum width | 8" | 12" | 18" | 6 | 4 |
| Large vibratory drum roller, minimum dynamic force 8,000# per ft. of drum width | 10" | 16" | 24" | 6 | 4 |

- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure. Uneven backfill outside foundation walls are permitted after slabs or suitable bracing are installed at the tops of the walls.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding.

3.14 SUBBASE AND BASE COURSES

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:

1. Shape subbase and base course to required crown elevations and cross-slope grades.
2. Compact subbase and base course as specified in Form 816 Section 3.12.

3.15 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified independent geotechnical engineer and/or testing agency to perform field quality-control testing.
- B. Allow geotechnical engineer and/or testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. When geotechnical engineer and/or testing agency reports show that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

3.16 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions at no additional compensation or change in Contract Time.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 31 20 00

5660-02-a2516-specs-312000 earth moving

SECTION 31 22 00 SEDIMENTATION AND EROSION CONTROL MEASURES

PART 1 – GENERAL

1.1 SUMMARY

- A. Work shall include the furnishing of all materials, labor and equipment to place and maintain erosion controls including but not limited to construction entrance pad, filter fence, erosion control blanket, sediment traps, diversion berms, inlet protection and/or hay bales to control surface water.
- B. Compliance with permit requirements of the CT DEEP Stormwater general permit for Construction Activities.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Section 31 20 00 – Site Preparation

1.3 QUALITY ASSURANCE

- A. Codes and Standards: All materials and construction methods shall conform to Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition including supplements, unless otherwise specified herein and the Connecticut Department of Energy & Environmental Protection (DEEP) "2002 Connecticut Guidelines for Soil Erosion and Sediment Control."
- B. Workmen: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Filter fabric fencing shall be a non-woven filter fabric having a weight of at least 2-1/2 ounces per square yard, a thickness of at least 17 mills, a co-efficient of not less than .0009 centimeters per second.
- B. Hay bales shall be made of hay with forty pounds minimum weight and one hundred twenty pounds maximum weight. Wood stakes shall be a minimum of 1 inch by 1 inch normal size by a minimum of 3 feet long.
- C. Broken stone for construction entrance shall be 1 inch to 2 inch broken stone.

PART 3 – EXECUTION

- A. Filter fabric fencing and hay bales shall be placed by the Contractor in locations shown on the plans, in accordance with the details shown on the plans.
- B. Maintain/ replace filter fabric fencing and hay bales as necessary and/ or as directed by the Owner.
- C. Filter fabric fencing shall be installed by the Contractor in locations shown on the plans, in accordance with the details shown on the plans.
- D. Contractor shall inspect erosion controls weekly and after storm events. Inspection reports shall be prepared and kept on-site.

END OF SECTION 31 22 00

5660-02-a2516-specs-312200 se control measures

SECTION 32 12 16 BITUMINOUS CONCRETE PAVING

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Provide all materials, equipment, and services necessary to furnish and deliver work of this Section as shown on the Drawings, as specified, and as required by job conditions including, but not limited to the following:
 - 1. Bituminous concrete paving
 - 2. Permanent pavement repair
 - 3. Bituminous concrete sidewalk

1.2 RELATED SECTIONS

- A. Section 31 10 00 – Site Preparation
- B. Section 31 20 00 – Earth Moving

1.3 QUALITY ASSURANCE

- A. Codes and Standards: All materials and construction methods shall conform to the Town standards and Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition and supplements, unless otherwise specified herein.
- B. Workmen: All workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- C. Testing and Inspection: Contractor shall employ and pay for a qualified independent laboratory to perform testing and inspection service required to confirm compliance with these specifications.

1.4 SUBMITTALS

- A. In accordance with the General Requirements, submit samples, materials certifications, manufacturer's product data and test reports as hereinafter required.
- B. Bituminous concrete design mix. Source of material, and percentage of recycled material.

1.5 JOB CONDITIONS

- A. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50°F (10°C) and when temperature has not been below 35°F (1°C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

- B. Construct hot-mixed asphalt surface course when atmospheric temperature is above 40°F (4°C) and when base is dry. Base course may be placed when air temperature is above 30°F (minimum 1°C) and rising.
- C. Grade Control: Establish and maintain required lines and elevations.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. General: Use locally available materials and graduations that exhibit a satisfactory record or previous installations.
- B. Bituminous Pavement and Curbing: Shall contain a maximum of 25% (combined) pre-consumer/post-consumer recycled content (the percentage of recycled content is based on the weight of the component materials).
- C. Subbase Material: See Section 31 20 00.
- D. Base Material: See Section 31 20 00.
- E. Hot Mixed Asphalt Paving: Bituminous concrete material conforming to Form 816 - State of Connecticut Department of Transportation "Standards for Roads, Bridges, and Incidental Construction", 1995 edition including supplements, Section M.04.
 - 1. Wearing surface shall be Class 2.
 - 2. Binder course shall be Class 1.

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

- A. General: Remove loose material from compacted subbase surface immediately before applying herbicide treatment or prime coat.
- B. Proof-roll prepared subbase surface to check for unstable areas and areas requiring additional compaction.
- C. Notify Contractor of unsatisfactory conditions. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.
- D. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.

3.2 PLACING MIX

- A. General: Place hot-mixed asphalt mixture on prepared surface, spread, and strike off. Spread mixture at minimum temperature of 225°F (107°C). Place areas inaccessible to equipment by hand. Place each course to required grade, cross-section, and compacted thickness.
- B. Paver Placing: Place in strips not less than 10 feet wide, unless otherwise acceptable to Engineer. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course.
- C. Immediately correct surface irregularities in finish course behind paver. Remove excess material forming high spots with shovel or lute.
- D. Joints: Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of hot-mixed asphalt course. Clean contact surfaces and apply tack coat.

3.3 ROLLING

- A. General: Begin rolling when mixture will bear roller weight without excessive displacement.
- B. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- C. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.
- D. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been evenly compacted.
- E. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained 95 percent laboratory density.
- F. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot hot-mixed asphalt. Compact by rolling to specified surface density and smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.4 FIELD QUALITY CONTROL

- A. General: Testing in-place hot-mixed asphalt courses for compliance with requirements for thickness and surface smoothness will be done by an independent testing laboratory. Repair or remove and replace unacceptable paving as directed by Engineer.
- B. Thickness: In-place compacted thickness tested in accordance with ASTM D 3549 will not be acceptable if exceeding following allowable variations:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus or minus 1/4 inch.
- C. Surface Smoothness: Test finished surface of each hot-mixed asphalt course for smoothness, using 10-foot straightedge applied parallel with and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:
 - 1. Base Course Surface: 1/4 inch.
 - 2. Wearing Course Surface: 3/16 inch.
- D. Check surface areas at intervals as directed by Engineer.

END OF SECTION 32 12 16

5660-02-a2516-specs-321216 bituminous concrete paving

SECTION 32 12 19 STONE DUST SURFACE

PART 1 – GENERAL

1.1 SUMMARY

- A. This work shall consist of the construction of stone screening pavement at the locations and to the dimensions shown on the plans, including earthwork and processed aggregate base.
- B. Related sections include the following:
 - 1. Section 31 20 00 Earth Moving

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
 - 1. Processed Aggregate Base
 - 2. Screenings
 - 3. Geotextile fabric

1.3 QUALITY ASSURANCE

- A. Codes and Standards: All materials and construction methods shall conform to Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition and supplements, unless otherwise specified herein.
- B. Installer Qualifications: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

1.4 PROJECT CONDITIONS

- A. Grade Control: Establish and maintain required lines and elevations.

PART 2 – PRODUCTS

2.1 AGGREGATES

- A. Processed Aggregate Base: See Section 31 20 00
- B. Screenings: shall conform to the gradation in Section M.01.01 of the Standard Specifications.

2.2 AUXILIARY MATERIALS

- A. Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

PART 3 – EXECUTION

3.1 STONE DUST SURFACE

- A. Clean existing subbase of loose and deleterious material immediately before placing stone dust surface.
 - 1. Grade the existing subbase material to the line and grade shown on the plans.
 - 2. Processed aggregate base shall be placed and compacted in accordance with applicable portions of Section 3.04.03 of the Standard Specifications.
 - 3. Screenings shall be placed in one layer. Prior to placing, the prepared crushed stone shall be maintained true to line and grade, at all times. The screenings shall be placed to a depth that will result in the proper depth after compaction.
 - 4. After the screenings are spread, they shall be thoroughly compacted and bound by the use of a vibratory roller. Water may be used during compaction. The direction and intensity of the stream shall be such that it will not disturb the surface and shall be approved by the Engineer.
 - 5. The compactive effort shall be as directed by the Engineer but in no case shall it be less than four complete passes.
 - 6. Any surface irregularities which develop during, or after the work, shall be corrected by loosening material already in place and removing or adding material as required, after which the entire area, including the surrounding surface, shall be re-compacted and rebound until it is brought to a firm and uniform surface satisfactory to the Engineer.

3.2 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Stone Dust Surface: Plus or minus 1/2 inch (13 mm).

3.3 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in conformance with local and federal regulations.

END OF SECTION 32 12 19

5660-02-a2516-specs-321219 stone dust surface

SECTION 32 13 13 CONCRETE PAVING AND CURBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes exterior cement concrete pavement for the following:
 - 1. All concrete curbing.
- B. Related Section
 - 1. Section 31 20 00 Earth Moving
 - 2. Section 32 13 73 Concrete Paving Joint Sealants

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete pavement mixture.
- C. Shop Drawings: For reinforcing steel and splicing materials.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- C. Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition shall be used for material compliance and execution of the work in this section.
- D. Workmen: All workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- E. Testing and Inspection: Contractor shall employ and pay for a qualified independent laboratory to perform testing and inspection service required by these specifications and in compliance

with the specifications outlined in the Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.
- C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- D. Plain Steel Wire: ASTM A 82, as drawn.
- E. Deformed-Steel Wire: ASTM A 496.

2.2 CONCRETE MATERIALS

- A. Concrete shall be Class "C" conforming to Article M.03.01 of the Standard Specifications where indicated on the Contract Drawings.
- B. Concrete shall be Class "F" conforming to Article M.03.01 of the Standard Specifications where indicated on the Contract Drawings.
- C. Water: Potable
- D. Air-Entraining Admixture shall conform to Article M.03.01 of the Standard Specifications.

2.3 CONCRETE SEALER FOR SALT PROTECTION

- A. Concrete sealer for salt protection shall be applied on the concrete finish. The product shall be specifically manufactured for this type of application. The Contractor shall submit product information for Engineer approval. The rate of application shall be as recommended by manufacturer. Sealer shall dry clear on concrete surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Proof-roll prepared aggregate base course below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excessive yielding.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

- A. General: Comply with Article 6.02 of the Standard Specifications.

3.4 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting buildings, concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to that shown on the Contract Drawings.

3.5 CONCRETE PLACEMENT

- A. Comply with Article 9.21 of the Standard Specifications.
 - 1. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.
- B. The Contractor is responsible for removing any material spatters or debris and repairing any damage to the existing sidewalk arising from the installation of the tile.

3.6 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.

- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- D. Concrete sealer for salt protection shall be applied on the concrete finish at the rate of application as recommended by the manufacturer.

3.7 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.
- C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

5660-02-a2516-specs-321313 concrete paving and curbing

SECTION 32 13 16 CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 SUMMARY

- A. Work under this Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 RELATED SECTIONS:

- A. Section 31 20 00 – Earth Moving
- B. Section 32 13 13 – Concrete Paving and Curbing

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.
- C. Shop Drawings: For steel reinforcement and formwork.
- D. Material test reports and certificates.

1.4 QUALITY ASSURANCE

- A. Workmen: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition with supplements shall be used for material compliance and execution of the work in this section.
- C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specification for Structural Concrete,"
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials"

- E. Pre-installation Conference: Conduct conference at Project site.
- F. A qualified testing agency for testing and inspection approved by the Engineer and paid for by the Contractor.

PART 2 – PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed.
 - 1. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M, epoxy coated, with less than 2 percent damaged coating in each 12-inch (300-mm) bar length.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.
- C. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.
- D. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884/A 884M, Class A coated, Type 1, deformed steel.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."
- F. Dowels: as specified on the Contract Drawings.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type II.

- B. Normal-Weight Aggregates: ASTM C 33, graded, 3/4-inch (19-mm) nominal maximum coarse-aggregate size.
 - 1. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 VAPOR RETARDERS

- A. Plastic Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.
- B. Plastic Vapor Retarder: ASTM E 1745, Class B. Include manufacturer's recommended adhesive or pressure-sensitive tape.
- C. Plastic Vapor Retarder: ASTM E 1745, Class C, or polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.

2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, non-dissipating [certified by curing compound manufacturer to not interfere with bonding of floor covering].
- G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.6 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: [ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4000 psi or 3000 psi at 28 days as specified on the Contract Drawings.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.50, watertight concrete 0.45.
 - 3. Slump Limit: 4 inches (100 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
 - 4. Air Content: 5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
 - 5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch (25-mm) or 3/4-inch (19-mm)] nominal maximum aggregate size.
 - 6. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.

2.8 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.9 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 – EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
 1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Expansion Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. Cold-Weather Placement: Comply with ACI 306.1.
- D. Hot-Weather Placement: Comply with ACI 301.

3.7 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view. Retain rubbed finish in first paragraph below with smooth-formed finish above.

- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
 3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce finished profile amplitude of 1/4 inch (6 mm) in 1 direction.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel finished floor surfaces.

F. Broom Finish: Apply a broom finish with picture frame border to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

3.9 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer. Curing and sealing compound in subparagraph below is usually for floors and slabs and may act as a permanent surface finish.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.10 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

3.11 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

1. Testing Services: Tests shall be performed according to ACI 301.

END OF SECTION 32 13 16

5660-02-a2516-specs-321316 cast-in-place concrete

SECTION 32 13 73 CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Expansion and contraction joints within cement concrete pavement.
 - 2. Joints between cement concrete and asphalt pavement.
- B. Related Sections
 - 1. Section 32 12 16 Bituminous Concrete Paving
 - 2. Section 32 13 13 Concrete Paving and Curbing

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each type and color of joint sealant required.
- C. Product certificates and test reports.
- D. Compatibility and Adhesion Test Reports: From sealant manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.
 - 1. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Colors of Exposed Joint Sealants: As selected by Engineer.

2.2 COLD-APPLIED JOINT SEALANTS

- A. Multicomponent Jet-Fuel-Resistant Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements for formulation and with ASTM C 920 for type, grade, class, and uses indicated:
 - 1. Urethane Formulation: Type M; Grade P; Class 12-1/2; Uses T, M, and, as applicable to joint substrates indicated.
 - 2. Coal-Tar-Modified Polymer Formulation: Type M; Grade P; Class 25; Uses T and, as applicable to joint substrates indicated.
 - 3. Bitumen-Modified Urethane Formulation: Type M; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated.
- B. Single-Component Jet-Fuel-Resistant Urethane Sealant for Concrete: Single-component, pourable, coal-tar-modified, urethane formulation complying with ASTM C 920 for Type S; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated.
- C. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS.
- D. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.
- E. Multicomponent Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.

2.3 HOT-APPLIED JOINT SEALANTS

- A. Jet-Fuel-Resistant Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3569.
- B. Jet-Fuel-Resistant Sealant for Concrete and Tar Concrete: Single-component formulation complying with ASTM D 3581.
- C. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3406.
- D. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 3405.

2.4 JOINT-SEALANT BACKER MATERIALS

- A. General: Provide joint-sealant backer materials that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.
- B. Round Backer Rods for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

- C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.
- D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience.
- C. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- D. Install backer materials to support sealants during application and at position required to produce optimum sealant movement capability. Do not leave gaps between ends of backer materials. Do not stretch, twist, puncture, or tear backer materials. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.
- E. Install sealants at the same time backings are installed to completely fill recesses provided for each joint configuration and to produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
- G. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION 32 13 73

5660-02-a2516-specs-321373 concrete paving joint seal

SECTION 32 31 13 CHAIN LINK FENCES AND GATES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

- 1. Chain-Link Fences

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Materials, dimensions, sizes, weights, and finishes of components. Include plans, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.

1.4 QUALITY ASSURANCE

- A. Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition shall be used for material compliance and execution of the work in this section and Chain Link Fence Manufacturer's Institute.
- B. Workmen: All workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. General: Height indicated on Drawings. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:
 - 1. Steel Wire Fabric: Galvanized steel
 - a. Mesh Size 2 inches, 9ga.

2.2 CHAIN LINK FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, ASTM F 1083 for Group IC round pipe, and the following:
 - 1. Fence Height: as specified on the Contract Drawings.
 - 2. Coating for Steel Framing:
 - a. Hot dipped galvanized with zinc coating

2.3 TENSION WIRE

- A. General: Provide horizontal tension wire as shown on Contract Drawings.
- B. Metallic-Coated Steel Wire: 0.177-inch- diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824.

2.4 CONCRETE

- A. 3,000 psi Class "C" conforming to the Standard Specifications

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacing's indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter. Footings to be crowned to shed water and prevent ponding around post.
- D. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment.
- E. Line Posts: Space line posts uniformly at a maximum of 10 feet o.c.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567. Install braces at ends and gate posts and at both sides of corner and pull posts.
- G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing.

H. Top Rail: Install according to ASTM F 567.

I. Bottom Rails: Install, spanning between posts.

END OF SECTION 32 31 13

5660-02-a2516-specs-323113 chain link fence

SECTION 32 31 21 GOAL POSTS

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all materials, equipment, and services necessary to furnish and deliver work of this Section as shown on the Contract Drawings, as specified, and as required by job conditions including, but not limited to the following:

1. Football Goal Posts

- B. Related Sections:

1. Section 31 20 00 Earth Moving
2. Section 32 13 16 Cast-in-Place Concrete

1.2 SUBMITTALS

- A. In accordance with the General Requirements, submit shop drawings and manufacturer's product data for:

1. Football Goal Posts

PART 2 – PRODUCTS

2.1 MATERIALS

- A. High School 8ft Offset Football Goal Post(s):

Model: GP4380PL High School Football Goal Post as manufactured by:

Sportsfield Specialties Inc.
P.O. Box 231
41155 State Highway 10
Delhi, NY 13753
p. 888-975-3343
f. 607-746-8481
www.sportsfieldspecialties.com

or approved equal

2.2 COMPONENTS:

- A. Gooseneck support: fabricated of 6" Schedule 40 aluminum pipe (6.625in OD), 5.0ft radius, 8ft offset.

- B. Mounting style:
 - 1. Base Plate Mounting Style
- C. Crossbar: fabricated of 6" Schedule 40 aluminum pipe (6.625in OD).
 - 1. Length: 23ft 4in – High School
- D. Uprights: fabricated of extruded 6061-T6 aluminum tube (4.0in OD) with rigid wire loop at upper end.
 - 1. Length: 20.0ft
- E. Powder Coat Finish: Yellow
- F. Installation package consisting of the following components:
 - 1. Base plate mounting kit
 - 2. GP4570 Access Frame Kit+: 1/8" (0.125") Aluminum Construction with Gasket Seal, 1" PVC Drain Stub, Dimensions: 9-5/8" H X 22-5/16" Square, With Two (2) Half Moon Filler Plugs, Optional One (1) 4522 Full Size Blank Filler Plug
- G. Accessories:
 - 1. Directional wind flags.
 - 2. Touch-up paint (Powder coat specific).
 - 3. #4412 Assembly bolts, and nuts – Stainless Steel.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS

- A. All Football Goal Posts and Accessories shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings. Concrete anchoring foundations to be determined by others based on local soil conditions and building codes. Installer should have a minimum of five (5) football goal post installations or similar experience in the previous three (3) years.

END OF SECTION 32 31 21

5660-02-a2516-specs-323121 goal posts

SECTION 32 92 00 TOPSOILING AND SEEDING

PART 1 – GENERAL

1.1 SUMMARY

- A. Furnishing, grading and treatment of topsoil to finish grade elevations, including mulching and fertilization.
- B. Seeding of lawn areas.
- C. Maintain cultivation of lawn areas, but not limited to: fertilization, reseeding, watering, weeding, and correcting the grade in areas of settlement.

1.2 RELATED WORK

- A. Section 31 10 00 – Site Preparation
- B. Section 31 20 00 – Earth Moving

1.3 SUBMITTALS

- A. Product data sheets, specifications, performance data, physical properties for the following:
 - 1. Seed mixture
 - 2. Fertilizer
- B. Manufacturer's Certificates or labels from containers certifying that the product meets the specified requirements for the following:
 - 1. Seed mixture, if pre-mixed, also show compliance with State and federal seed laws
 - 2. Fertilizers
- C. Samples (and test report), in the following quantities:

Topsoil, five gallon pail – Provide representative testing to indicate percent organic content for both on-site and off-site source material. Only topsoil meeting organic content specification (6% min. – 20% max.) is acceptable.

1.4 QUALITY ASSURANCE

- A. The Owner reserves the right to test and reject for cause any material not meeting material specifications by tests in accordance with methods adopted by the Association of Official Agricultural Chemists. Costs for these tests shall be borne by the Contractor [subcontractor].

- B. Acceptance of the lawn areas shall be established by the Landscape Architect in writing, following the completion of all maintenance work requirements as specified herein, and following the correction of all punch list deficiencies by the Contractor.
- C. Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability to Landscape Architect, together with proposal for use of equivalent material.
- D. Analysis and standards – Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver grass seed mixture in new, sealed, containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in sealed waterproof bags showing weight, chemical analysis and name of manufacturer.

1.6 JOB CONDITIONS

- A. Seeding shall be performed when weather and soil conditions are suitable in accordance with locally accepted practice, as specified herein.
- B. Seeding dates are as follows:

April 15 - May 30
August 20 - September 30
Do not install grass seed when wind velocity exceeds 5 mph.

1.7 SEQUENCING AND SCHEDULING

Coordinate the work of this Section with the respective trades responsible for installing interfacing work to ensure that the work performed thereunder is scheduled to minimize damage to lawn areas.

1.8 MAINTENANCE SERVICE

Furnish maintenance of seeded [sodded] areas immediately after placement until grass is well established and exhibits a vigorous growing condition.

1.9 SPECIAL PRODUCT WARRANTY

- A. Warranty lawns until final acceptance.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Grass Seed: Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop with a weed seed content of less than 0.5 [1] percent, by weight. All seed shall comply with State and federal seed laws. Seed, which has become wet, moldy or otherwise damaged shall not be acceptable.
- B. Seed may be mixed on-site by an approved method or pre-mixed by a dealer. If the seed is to be mixed on-site, seed shall be delivered to the site in separate containers for each variety of seed.

C. General Lawn Seed Mix

| | Percent by Weight | Min. Purity | Min. Germination |
|-------------------------------|----------------------|----------------|---------------------|
| American Kentucky bluegrass | 10 | 98 | 98 |
| Victory II chewing fescue | 20 | 98 | 85 |
| Jasper II creeping red fescue | 20 | 98 | 85 |
| Spartan hard fescue | 20 | 96 | 85 |
| Cutter perennial ryegrass | 30 | 97 | 90 |

Seeding rate - 260 pounds per acre

- D. Soil Materials: Use existing topsoil if it satisfies organic content specification.
- E. Additional loam, if required, shall be fertile, friable, agricultural soil, typical for locality, pH value compatible, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and free from other impurities, plants, weeds and roots.
- F. Soil Additives: Ground agricultural limestone containing not less than 85 percent total carbonates by weight. Limestone shall be graded per the following:
 - 100 percent passing a Number 10 sieve.
 - 90 percent passing a Number 20 sieve.
 - 60 percent passing a Number 100 sieve.
- G. Fertilizer: 10-10-10 recommended for grass, with 50 percent of the elements derived from organic sources, of proportion necessary to eliminate any deficiencies of topsoil as indicated in analysis.
- H. Straw Mulch: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
- I. Peat Moss: Shredded, loose, sphagnum moss; free of lumps, roots, inorganic material or acidic materials. According to the methods of AOAC methods of testing, the acidity range shall be

approximately 3.5 to 5.5 pH and a maximum moisture content of 30 percent. Organic matter content shall be not less than 90 percent, and ash content shall not be more than 10 percent, by weight on an oven-dry basis.

- J. Accessories: Water - Clean, fresh and free of substances or matter, which could inhibit vigorous growth of vegetation.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify prepared soil base is properly rough graded and ready to receive the work of this Section.
- B. Verify substrate base has been contoured and compacted.
- C. Beginning of landscaping work means acceptance of existing soil base, and site conditions.

3.2 PREPARATION

- A. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes in level areas.
- B. Remove foreign materials, debris, weeds, undesirable plants, roots, branches, stones in excess of 1/2 inch in size. Remove subsoil contaminated with petroleum products, or other materials, which would inhibit healthy plant growth.
- C. Scarify subgrade to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment is used for hauling and spreading topsoil and has compacted subsoil.
- D. Saturate soil with water to test drainage.

3.3 LAYOUT OF LAWN AREAS

- A. Outlines of lawn areas shall be staked by the Contractor [subcontractor] in ample time to permit review and acceptance by Landscape Architect.

3.4 PLACING AND TREATING TOPSOIL

- A. Place both stockpiled topsoil and additional loam during dry weather; place to a minimum compacted depth of 6 inches on dry unfrozen subgrade. Treat additional loam with ground limestone.
- B. Fine grade topsoil, making changes in grade gradual, eliminating rough or low areas. Blend slopes into level areas. Manually spread topsoil close to trees, plants, and building to prevent damage. Roll, fill depressions to ensure positive drainage.
- C. Remove roots, weeds, rocks and foreign material while spreading.

- D. Remove surplus subsoil and topsoil from site. Leave stockpile areas and site clean and raked ready to receive grass.
- E. Apply fertilizer in accordance with manufacturer's instructions, or testing agency recommendations (if tests are made), within 10 days of seeding, after smooth raking of topsoil and prior to roller compaction.
- F. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- G. Mix thoroughly into upper 6 inches of topsoil.
- H. Lightly water to aid the dissipation of fertilizer.
- I. After incorporation of fertilizer and limestone into the soil, fine grade seed bed to remove all ridges and depressions, and the surface cleared of all stones one inch or more in diameter and all other debris.
- J. Smooth rake again and clear surface of all stones one inch or more in diameter and all other debris.

3.5 SEEDING

- A. Apply seed by mechanical spreader at a rate 5 pounds per 1000 square feet evenly in two uniform applications. Direction of the second application shall be perpendicular to the first application. Rake in lightly.
- B. Do not seed areas in excess of that which can be mulched on same day.
- C. Do not sow immediately following rain or snow, when ground is too dry, or during windy periods.
- D. After seeding, lightly rake areas to mix 1/8 to 1/4 inch depth of soil with seed.
- E. Roll seeded area with roller of 24 inch diameter and not exceeding 90 pounds per 24 inch roller width.
- F. Immediately following seeding and compacting, apply approved straw mulch to a thickness of 1/8 inch, keeping clear of shrubs and trees.
- G. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

3.6 SITE CLEANING AND REPAIR

Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition.

3.7 PROTECTION OF LAWNS

- A. Identify lawn seeded areas with stakes and string around area periphery.
- B. Cover seed slopes where grade is 4 inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil. Secure
- C. Outside edges and overlaps at 36 inch intervals with stakes. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
- D. At sides of ditches, lay fabric laps in direction of water flow; lap ends and edges minimum 6 inches.

3.8 CLEANUP AND PROTECTION

- A. During landscape work, keep pavements clean and work area in an orderly condition.
- B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.9 INSPECTION AND ACCEPTANCE

- A. When landscape work is completed, including maintenance, Landscape Architect will, upon request, make an inspection to determine acceptability.
- B. When inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by Landscape Architect and found to be acceptable. Remove rejected plants and materials promptly from project site.
- C. Final acceptance of seeded lawns is based on an established turf thickly uniform and well developed over 95% of the bed and ready for the Owner to use and occupy. The Contractor is responsible for all mowing until final acceptance.
- D. Substantial completion for installation of trees and shrubs is the date the landscape contractor has complied with the punch list items developed by the Landscape Architect. This date shall be defined and noted by the Landscape Architect in a memorandum issued to the Owner.

END OF SECTION 32 92 00

5660-02-a2516-specs-329200 topsoiling and seeding

SECTION 33 32 30 SYNTHETIC INFILLED ATHLETIC TURF SURFACE

PART 1 – GENERAL

1.1 SUMMARY

- A. Furnish all labor, materials, tools and equipment necessary to install a dual fiber (slit film, monofilament blend) artificial grass field turf as indicated on the plans and as specified herein. The installation of all new materials shall be performed in strict accordance with the Manufacturer's* installation instructions and in accordance with the Contract Documents. The work will include, without limitation, the survey layout for the placement of the synthetic turf fabric; the placement of the fabric and the sewing of seams; fastening the fabric to the concrete edge (provided by the General Contractor); installing lines and marks for each sport; installing the organic infill; final grooming; and training of school personnel on maintenance procedures.
- B. Provide written acceptance from the turf manufacturer of the perimeter edge detail meets the requirements for the installation of the synthetic turf. It is the responsibility of the Contractor to repair any deficiencies in the dynamic stone base.
- C. Provide written acceptance from the turf manufacturer that the perimeter edge detail meets the requirements for the installation of the synthetic turf. It is the responsibility of the Contractor to install the perimeter edge details required for the system in strict accordance with the Manufacturer's requirements and as approved by the Owner.

*For the purpose of this specification, the term Turf Manufacturer may be interpreted as meaning Turf Vendor since it is understood that some, but not all, suppliers of synthetic turf purchase the carpet (fabric) from an independent carpet mill.

1.2 RELATED SECTIONS

- A. Section 334623 – Athletic Field Subsurface Drainage System

1.3 REFERENCES

- A. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition
- B. ASTM Standard Test Methods:
 - D1577 - Standard Test Method for Linear Density of Textile Fiber
 - D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
 - D418 - Standard Test Method for Testing Pile Yarn Floor Covering Construction
 - D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
 - D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
 - D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)
 - F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
 - D4491 - Standard Test Methods for Water Permeability of Geotextile by Permittivity

- D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
- F355 - Standard Test Method for Shock-Absorbing Properties of Playing Surfaces.
- F1936 - Standard Test Method for Shock-Absorbing Properties of North American Football Field Playing Systems as Measured in the Field
- D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

C. Current NFHS and CIAC Rules and Interpretations

D. Current "Suggested Guidelines for the Essential Elements of Synthetic Turf Systems" of the Synthetic Turf Council (STC).

1.4 SUBMITTALS

A. Prior to the Engineer/Landscape Architect's approval of a specified artificial turf system, the Turf Manufacturer/Vendor shall provide a notarized Affidavit that its turf system does not violate any other manufacturer's patents, patents allowed, or patents pending.

B. Prior to the Engineer/Landscape Architect's approval of the specified turf system, the Turf Manufacturer/Vendor shall provide a notarized Affidavit that its turf system, including the fiber, and infill after installation will meet or exceed the requirements related to discharges into surface or ground water and emissions in effect at the time of installation established by the U.S. Environmental Protection Agency, the State of Connecticut Departments of Energy and Environmental Protection and Public Health, and any other agency of competent jurisdiction.

C. **Submit the following with the Proposal:**

1. One rag sample, 12x12 inch in size, illustrating details of finished product.
2. One boxed sample including infill representative of the finished synthetic turf system.
3. A bagged sample of the organic infill.
4. A letter and specification sheet certifying that the products of this section meet or exceed specified requirements.
5. Certified copies of independent (third-party) laboratory reports on ASTM tests specified in Section 2.1.B below.
6. List of existing recent installations using dual fiber with a traditional and alternative infill system in the United States, including Owner representative and telephone number.
7. The Turf Manufacturer/Vendor shall provide a sample copy of insured, non-prorated warranty and insurance policy information.

D. Prior to ordering of materials:

1. The Turf Manufacturer/Vendor shall submit through the General Site Contractor Shop Drawings indicating:
 - a. Field Layout, as directed by the Owner and indicated on the contract drawings.
 - b. Field Marking Plan and details for the specified sports meeting the requirements of NFHS and CIAC.
 - c. Roll/Seaming Layout.

- d. Methods of attachment, field openings, and perimeter conditions.
- e. Dimensions and colors for the centerfield logo.
- 2. The Turf Manufacturer/Vendor shall submit:
 - a. The fiber manufacturer's name, type of fiber, and composition of the fiber
 - b. Infill manufacturer's name, composition of material, and MSDS and other related environmental test data.
 - c. Rag samples for colors to be used in the field event line stripping and centerfield logo.
- E. Prior to Final Acceptance, the Contractor shall submit to the Owner:
 - 1. Five (5) printed copies and one (1) electronic copy (pdf) of Maintenance Manuals, which will include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.
 - 2. The testing data and certification from an approved independent testing laboratory that the finished field meets and/or exceeds the required impact attenuation G-max, as per ASTM F1936 and these specifications.
 - 3. Project Record Documents: Record actual locations of seams, drains, or other pertinent information.
 - 4. Warranty: Submit Manufacturer Warranty for synthetic turf and organic infill and ensure that forms have been completed in Owner's name and registered with Manufacturer.
 - 5. **Attic Stock:** Provide an additional 15 feet by 20 feet of green turf. Provided one sack (minimum one ton) of surplus organic infill material separated into manageable plastic containers for storage at a location specified by the Owner. Plastic containers shall be Rubbermaid BRUTE Rollout Container(s), maximum 65 gallon size, constructed from HDPE, with heavy duty wheel and attached lid, or approved equal.

1.5 QUALITY ASSURANCE

- A. Manufacturer/Vendor Qualifications: Company whose primary business specializes in manufacturing and installing synthetic infill athletic turf products specified in this section. The turf manufacturer/vendor and its installation personnel:
 - 1. Must be experienced in the manufacture and self-installation or by licensee of this specific type of dual fiber grass system for at least five years in the United States and Europe.
 - 2. Must have experience with NCAA, FIFA or NFHS baseball, football, soccer, lacrosse or field hockey fields installed with the product specified in these Contract Documents.
 - 3. Must have fields of 75,000 sq. ft. or more of the specified turf material in play for at least three years.
- B. Installer Qualifications: Company specializing in performing the work of this section.
 - 1. The manufacturer must provide competent workmen skilled in this specific type of synthetic turf installation. Such employees shall be directly employed by the turf manufacturer/vendor or by a licensee of the Manufacturer installing the Manufacturer's products as the principal turf product. Independent subcontractors shall not be permitted. Evidence of such employment shall be submitted to the Owner prior to the installation of the turf.

2. The designated supervisory personnel on the project must have five years of experience and be certified, in writing by the Turf Manufacturer/Vendor, as competent in the installation of this dual fiber material, including sewing seams and proper installation of the infill mixture.

1.6 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to project site in wrapped condition.
- B. Store products under cover and elevated above grade.

1.8 WARRANTIES

- A. The Turf Manufacturer/Vendor shall provide a warranty to the Owner that covers defects in materials, installation, workmanship of the turf, and the organic infill for a period of eight years from the date of Substantial Completion. The Turf Manufacturer/Vendor shall verify in writing to the Owner that their on-site representative has inspected the installation and that the work conforms to the Manufacturer's requirements. The artificial grass field turf must maintain an ASTM F355/ASTM F1936 measured G-max of between 85-120 for the life of the warranty.
- B. The Turf Manufacturer/Vendor's warranty shall include general wear and damage caused from UV degradation.
- C. The Turf Manufacturer/Vendor's warranty must be supported by a third party prepaid, non-cancelable insurance policy for the full eight (8) year period from an insurance company with an AM Best rating of A- or better, no maximum limit on a single claim, no deductible or retention amount per claim. The insurance policy shall be in favor of the Owner and shall be specific to the project site.

A draft copy of the full policy shall be submitted by each bidder with their bid and shall indicate that such coverage is now in effect or will be in effect at the time of the execution of the contract with the Owner. The synthetic Turf Manufacturer/Vendor shall also submit a signed affidavit affirming the warranty requirements of these specifications. The effective date of the policy shall begin at the time of substantial completion of the field and shall terminate eight (8) years thereafter.

1.9 MAINTENANCE SERVICE

- A. The Turf Manufacturer/Vendor will train the Owner's facility maintenance staff in the use of the Turf Manufacturer's/Vendor's recommended groomer and other appropriate maintenance practices. Up to eight hours of training are included in this specification.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. The component materials of the synthetic grass field turf system consist of:
1. A carpet made of UV-resistant polyethylene slit-film and monofilament fibers tufted into a fibrous, either perforated or non-perforated, porous multi-layer backing.
 2. Glue, thread, paint, seaming fabric, and other materials used to install and mark the artificial grass slit-film turf.
- B. The installed artificial grass slit-film turf shall have the following properties:

| Standard | Property | Specification |
|------------------|-----------------------------|--------------------------------|
| ASTM D1577 | Fiber Denier – Silt Film | 8,000 nominal |
| | Fiber Denier - Monofilament | 10,000 nominal |
| ASTM D418/D5848 | Pile Height | 1.75" nominal |
| ASTM D418/D5848 | Pile Weight | 41 oz./sq. yd. |
| ASTM D1335 | Tuft Bind | 9 lbs. (without infill) |
| ASTM D1682/D5034 | Grab Tear (width) | >200 lbs/force |
| ASTM D1682/D5034 | Grab Tear (length) | >200 lbs/force |
| ASTM D5793 | Stitch Gauge | 3/8" |
| ASTM D4491 | Carpet Permeability | >40 inches/hour |
| ASTM F1936 | Impact Attenuation, Gmax | ≥85-100 (+/-10) @ installation |
| | | ≤120 over field life* |

*TURF SYSTEM will be installed over resilient polypropylene shock/drainage pad. See section 2.3 for requirements. However, the field shall be tested for Gmax one time upon completion of installation prior to acceptance per the requirements of this specification.

- C. The carpet shall consist of polyethylene slit film and monofilament fibers tufted into a primary backing with a secondary backing.
1. The carpet shall be furnished in 15' wide rolls. Rolls shall be long enough to go from sideline to sideline without splicing.
 2. The carpet's primary backing shall be a double-layered polypropylene fabric treated with UV inhibitors. The secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 3. The fiber shall be low friction, UV-resistant fiber measuring 1.75 inches high nominal. Systems with less than a 1.75 inches (nominal) fiber will not be permitted.
- D. Thread for sewing seams of turf shall be as recommended by the synthetic Turf Manufacturer/Vendor.
- E. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic Turf Manufacturer/Vendor.

2.2 INFILL MATERIALS

- A. Organic Infill preapproved manufacturers include Geofill, Greenplay, or Geo Plus.
1. Organic infill: Infill system shall be comprised of a proven blend of coconut fiber matrix blended with cork, brown in color, 100% organic, not chemically treated & pesticide free.
 2. The organic infill must be mineral free to avoid abrasiveness and compaction.
 3. The bulk density of the organic infill must be less than 12 lbs. per cubic foot or 160 grams per cubic centimeter.
 4. No more than 43% of the organic infill comprised of coconut fiber and cork shall pass through the #18 (1mm) sieve.
 5. Durability and resistance to compaction:
 - a. Must be able to retain no more than a 10% variance in gradation or bulk density after a thousand repeated impacts of a 20-pound missile.
 6. Typical infill quantity varies with pile height and density:
 - a. 2 lbs. per square foot for a 2 ½ inch pile height.
 - b. 1 ¾ lbs. per square foot for a 2 inch pile height.
 - c. 1 ½ lbs. per square foot for a 1 ¾ inch pile height.
 7. Installation:
 - a. Prepare the turf by first installing a uniform ballast layer of rounded or sub-rounded 20/40 silica sand at 4 lbs. (min) per square foot.
 - b. Organic infill is to be installed in layers until reaching the desired infill depth based on the pile height as described above.
 - c. Upon completion of filling, the field must be watered down to allow for settling of the infill.
 - d. Allow the infill to dry and apply a final layer to top-off the installation, then wet the field once again before delivering to customer.
 - e. Upon completion, free pile height shall be no more than ¾ inch.
 8. End of Life Recyclability:
 - a. The organic infill must be 100% organic and natural for utilization after removal from the turf as a top-dressing for natural grass or to be tilled into natural soil.
 - b. The organic infill must be 100% organic and natural as to not contaminate the synthetic turf after its full life cycle with any inorganic components that would prevent it from re-purposing.

2.3 RESILIENT POLYPROPYLENE SHOCK PAD/DRAINAGE PAD

- A. Description: Resilient Polypropylene Base Material
1. Vertical drainage – 50" per hour minimum (EN12616)
 2. Friction coefficient – movement of artificial turf over 50 mm distance 2.0 lbs maximum force ISO 8295
 3. Coefficient of linear thermal expansion < 0.15 mm /m /° C, ISO 4897. Thermal Resistance (R Value) minimum 3.0 per ASTM D3575
 4. Provide maximum average G-Max of field of 100 upon initial testin (ASTM F355; System test under infilled turf)

5. Guarantee maximum average G-Max of field of 120 during warranty period of turf. (ASTM F355; System test under infilled turf).
6. Field must meet critical fall height minimum of 1.6 meters for the warranty period of the turf. Examples of a minimum of 5 fields in the USA at least 5 years old must be provided.
7. Supplier must provide documentation that product meets human health screening levels and total threshold limit concentration using EPA Method 3052 and Title 22 (CAM 17) metals using EPA Method 6020/7471A and for hexavalent chromium using EPA Method 7196A.
8. Product must be Cradle to Cradle Certified.
9. Product must be made in the United States of America.
10. Manufacturer must prove absence of heavy metals in production material, and controlled chain of custody for all materials used.
11. Manufacturer: Brock International or pre-approved equal.

B. Product Format

1. Size: approximately 61.1 x 42.0 inches interlocking panels.
2. Area: Net Coverage per panel 16.89 ft²
3. Thickness: 0.90" (23 mm) +/- 0.18"
4. Panel Weight: approximately 3.5 lbs / panel

- C. Product substitutions are allowed only in accordance with pre-bid substitution request procedures outlined in the contract documents. No substitutions will be allowed after the bid date. Bidding contractor must identify performance base system with bid package. If a non-specified product is identified, the proposed alternate product must be submitted and pre-approved by the Engineer/Landscape Architect 5 days prior to the bid opening. If bidding contractor does not identify a manufacturer, the Town will assume that the specified product is included in the bid package and will not consider substitutions. No product substitutions will be accepted after award.

2.4 FIELD GROOMER

- A. Supply a field groomer, which shall include a towing mechanism compatible with a field utility vehicle.
- B. The field groomer shall be a Greens Groomer Synthetic Turf Groomer, FieldTurf Groomright, Redexim Verti-Groom, SMG TurfCare TCA1400 or approved equal.

2.5 TURF SWEEPER

- A. Supply a field sweeper, 46" minimum width, suitable for removing leaves, loose paper and other debris, which shall include a towing mechanism compatible with a field utility vehicle.

PART 3 – EXECUTION

3.1 GENERAL

- A. The installation shall be performed in full compliance with the Contract Documents, approved Shop Drawings, and the instructions of the Manufacturer.
- B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, and topdressing or brushing operations.
- C. All designs, markings, layouts, and materials shall conform to all currently applicable NFHS and CIAC rules and/or any other rules or standards that may apply to this type of synthetic grass installation. All designs, markings, and layouts must first be approved by the Engineer or Owner in the form of approved shop drawings. All markings will be installed in full compliance with those drawings. Prior to the beginning of installation, the Turf Manufacturer/Vendor for the synthetic turf shall inspect and accept the sub-base for planarity. The Turf Manufacturer/Vendor shall also accept in writing that the base is in compliance with the synthetic Turf Manufacturer's/Vendor's specifications for permeability, compaction, and gradation after the Owner provides him with all test results. The Turf Manufacturer/Vendor shall have the dimensions of the field and locations for markings measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.
- D. The Turf Manufacturer/Vendor shall provide the necessary testing data to the owner that the finished field exceeds the required shock attenuation as per ASTM F1936.

3.2 EXAMINATION

- A. Verify that all sub-base leveling is complete prior to installation.
- B. The surface to receive the synthetic turf shall be inspected by the Turf Manufacturer/Vendor and, prior to the beginning of installation, the Manufacturer must accept the sub-base planarity in writing. The acceptance will be based on the Owner providing the Manufacturer with test results indicating that compaction and planarity are in compliance with the synthetic Turf Manufacturer's/Vendor's specifications. The surface must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.
- C. The compaction of the sub-base material shall be 95%, $\pm 1.5\%$ according to the Modified Proctor procedure (ASTM D1557), and the surface tolerance shall not exceed 0-1/4" over 10 feet and 0-1/2" from design grade.

3.3 INSTALLATION

- A. Install in accordance with Turf Manufacturer's/Vendor's instructions. The Turf Manufacturer/Vendor shall strictly adhere to the installation procedures outlined under this section. Any variance from these requirements must be accepted in writing by the

Manufacturer's on-site representative and submitted to the Architect/Owner, verifying that the changes do not in any way affect the warranty. Infill materials shall be approved by the Manufacturer and installed in accordance with the Manufacturer's standard procedures.

- B. The carpet rolls are to be installed directly over the resilient polypropylene base material and fastened to the concrete curb or edge drain as shown on the plans. Extreme care should be taken to avoid disturbing the base, in regard to planarity.
- C. The full width rolls shall be laid out across the field. Turf shall be of sufficient length to permit full cross-field installation from sideline to sideline. No head or cross seams will be allowed in the main playing area between the sidelines. Utilizing standard state of the art sewing procedures, each roll shall be attached to the next. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing field turf.
- D. This is a 99% sewn installation. Gluing of rolls shall not be acceptable. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications. All seams shall be sewn using double bagger stitches and polyester thread or, in the case of inlays only, adhered using seaming tape and high grade adhesive (per the Manufacturer's standard procedures). Seams shall be flat, tight, and permanent with no separation or fraying.
- E. Infill materials shall be installed per Section 2.2 of the specifications. The infill material shall be installed to a depth indicated on the drawings.
- F. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The infill shall be placed to expose the fibers to the depth indicated on the Contract Drawings.
- G. Synthetic turf shall be attached to the perimeter edge detail in accordance with the Manufacturer's standard procedures.

3.4 FIELD MARKINGS

- A. All markings are to be installed in accordance with the Contract Drawings and approved shop drawings.

3.5 CLEANING

- A. Protect installed field turf from subsequent construction operations.
- B. Do not permit traffic over unprotected field surface.
- C. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- D. All usable remnants of new material shall become the property of the Owner.

- E. The Contractor shall keep the area clean throughout the project and clear of debris.
- F. Surfaces, recesses, enclosures, etc. shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.6 ANNUAL INSPECTION, TESTING AND REPORTING BY TURF MANUFACTURER/ VENDOR

- A. On or before the annual anniversary date of acceptance of the synthetic turf by the Owner **for the term of the warranty**, the Turf Manufacturer/Vendor or its authorized representative, including any successor to the company, at no cost to the Owner shall inspect the field to identify deficiencies that may be apparent and that could have an effect on the terms and conditions of the warranty. The findings of such inspection shall be provided to the Owner within one week of such inspection. Any remedial actions that are deemed by the Owner to be the responsibility of the Turf Manufacturer/Vendor and not related to the Owner's maintenance practices shall be undertaken within 15 days of the submission of the inspection report to the Owner.

END OF SECTION 33 32 30

5660-02-a2516-specs-333230 synthetic turf

SECTION 33 33 00 SYNTHETIC TRACK

PART 1 – GENERAL

1.1 SUMMARY

- A. This work shall consist of providing all labor, materials, equipment, and appurtenances to complete the installation of a running track and D-zone surface. The track surface system shall be a urethane type. Work shall include the layout and painting of all track lines and event markings as required and specified by current National Federation of State High School Associations (NFHS) rules. This work shall also include the application of a structural spray coat (structural spray coat, seal coat and urethane markings only) over portions of the existing track surfacing to remain, and restriping/painting of the existing lines and markings.
- B. The synthetic surfacing contractor shall refer to the drawings for the required locations of synthetic track surfacing to be installed. All quantities and dimensions shall be field verified by the synthetic surfacing contractor.
- C. Only one type of approved track system by one manufacturer will be allowed.
- D. The synthetic surfacing contractor shall coordinate the work specified with an authorized and appointed representative of the owner so as to perform the work during a period and in a manner acceptable to the Owner.
- E. The installation of the synthetic track and D-Zone shall be directed by a technical supervisor provided by the Contractor who has previous experience and is familiar with the requirements of the manufacturer of the track system. The name of the technical supervisor shall be submitted to and approved by the Owner prior to the award of the Contract. The technical supervisor shall be on-site for the duration of the installation.
- F. Codes and Standards:
 - 1. Applicable Publications – Codes and standards follow the current guidelines set forth by the International Amateur Athletic Federation (IAAF) and the National Collegiate Athletic Association (NCAA), along with the current material testing guideline as published by the American Society of Testing and Materials (ASTM).
 - 2. The synthetic running track and D-zone areas shall conform to ASTM Standard 2157-09.
 - 3. Performance Standards for polyurethane-based synthetic surfaces shall exhibit the following minimum performance standards (ASTM):

| | |
|---------------------------|--|
| Thickness: | (12-13 mm) or as specified |
| Shore A Hardness: | 55±5 (ASTM D-2240) |
| Elongation at Break: | ~90% (ASTM D-412) |
| Tensile Strength: | 0.75 N/mm ² (ASTM D-412_ |
| Compression Set Recovery: | 90%-95% over 24 hr. period (ASTM D-412) |
| Abrasion Resistance: | 0.25 grams loss after 1000 cycles (ASTM D-501) |
| Coefficient of Friction: | Dry: 0.7-0.75, Wet: 0.6-0.65 (ASTM D-501) |

| | |
|------------------|------------------------|
| Resilience: | 37%-39% (ASTM D-2632) |
| Tear Resistance: | 50-65 psi (ASTM D-624) |

G. Related Sections:

1. Section 31 20 00 Earth Moving
2. Section 32 12 16 Bituminous Concrete Paving

1.2 QUALITY ASSURANCE

- A. The approved Sub-Contractor shall have a minimum of five (5) years' experience of successfully installing polyurethane-based running tracks and provide a listing of a minimum of 10 complete tracks, including those requiring a structural spray, in New England. Of the required track experience identified herein, the Sub-Contractor must provide a listing of at least five (5) such tracks within the past five (5) years.
- B. The Contractor shall be able to furnish evidence that they have been in business for a period of not less than ten (10) years (double the warranty period), under the present name, and if required, furnish financial statements for each of the past three years.
- C. The Contractor is required to provide documentation (at the time of bid) that shows the selected specified and installed products meet IAAF Performance Specification for Synthetic Surfaced Athletics Tracks (Outdoor) and is accredited in terms of the IAAF certification system.
- D. The Contractor must employ an American Sports Builders Association (ASBA) Certified Track Builder, who shall oversee the project.
- E. Asphalt surface shall comply with the guidelines of the ASBA and the National Asphalt Pavement Association (NAPA) for surface planarity and density.
- F. All liquid materials shall be from a single source and manufactured for the purpose of either type of track construction.
- G. The Contractor shall record the batch number of each product used on the site and maintain it throughout the warranty period.
- H. The Contractor shall provide the Owner, an estimate of the volume of each product and the weight of the rubber granule to be used on site.
- I. The track surface Contractor shall maintain constant quality control inspection of track surface installation at all times to eliminate inconsistencies in pattern, texture, color, and replace any deficiencies or stop work until proper material and workmanship can be installed.
- J. Care shall be taken to prevent overspray onto other project elements. The Contractor shall cover all existing improvements including fencing, bleachers, drain grates, synthetic turf, grass areas, etc.

1.3 SUBMITTALS

- A. Standard printed specifications of the track surfacing system to be installed on this project.
- B. An affidavit attesting the proposed track surfacing system and materials to be installed meets the requirements defined by the manufacturer's currently published specifications and any modifications outlined in those specifications.
- C. A synthetic track surfacing system sample, 6"x6" in size, of the same synthetic track surfacing system to be installed on this project.
- D. An installation list of outdoor track facilities installed in the last five (5) years using the exact synthetic track surfacing system specified herein.
- E. ASBA Certified Track Builder Documentation.
- F. All lines and marking shall be true to lines and shall be straight at all locations and conditions. A certification of compliance shall be provided to the Owner.
- G. Certification of Test Results: Tests are to be made available upon demand by the Owner or the Engineer. These are to be certified by an independent licensed laboratory.
 - 1. Current material safety data sheets (MSDS) for the liquid components.
 - 2. Authorized Applicator certificate from the surface system manufacturer.
 - 3. A certificate from the manufacturer of the binders and coatings stating that the materials have been produced specifically for the use in sports surfacing construction.
 - 4. A test report that the system has been tested to IAAF standards for force reduction and modified vertical deformation.

PART 2 – PRODUCTS

2.1 MATERIAL HANDLING:

- A. Store material in accordance with manufacturer's specifications and MSDS.
- B. Deliver products to the site in original, unopened containers with labels attached.

2.2 BITUMINOUS CONCRETE BASE:

- A. The bituminous concrete shall conform to the requirements of Section M.04 of the Standard Specifications. Class 2 mix shall be used for the top course and Class 1 for the binder course.
- B. Processed aggregate base shall conform to the requirements of Article M.05.01, except that course aggregate shall be broken stone, and fine aggregate shall be stone sand, screenings, or a combination thereof. No reclaimed miscellaneous aggregate will be allowed.

- C. Granular fill shall conform to the requirements of Article M.02.01-1 of the Standard Specifications. No reclaimed miscellaneous aggregate will be allowed.

2.3 URETHANE TRACK SYSTEM:

- A. Materials shall be as supplied by Beynon for BSS -200 or approved equal. The materials shall consist of:
 - 1. Primers
 - a. Primers must be polyurethane-based, specifically formulated to be compatible with the paved SBR base and track surfacing material.
 - 2. Black SBR Granules
 - a. The rubber granules for the base mat shall be recycled SBR rubber, processed and chopped to 1-3mm size, containing less than 4% dust.
 - 3. EPDM Granules
 - a. The rubber granules for the BEYPUR structural spray wearing coats shall be EPDM peroxide cured, synthetic rubber containing a minimum 20% EPDM resin, with a specific gravity of 1.5 ± 0.1 g/cm³. The EPDM rubber shall be the same color as chosen by the owner for the track surface. Color: RED.
 - 4. Polyurethane Binder
 - a. Binder for the black mat shall be BEYPUR, an MDI-based single-component, polyurethane binding agent. The binder shall not have a free TDI monomer level above 0.2%, must be clear in color and must be solvent free. The binder must be specially formulated for compatibility with SBR rubber crumb.
 - 5. Structural Spray Coating
 - a. The spray coating shall be BEYPUR, an MDI-based single-component, moisture cured, 100% solids, pigmented polyurethane, specifically formulated for compatibility with EPDM granules. The coating shall be the color specified by the owner. Pigment intergraded in the field shall not be allowed.
 - 6. Seal Coat
 - a. BEYPUR 200, the two-component polyurethane resin for this application, shall be pigmented to match the color of the wear coat. The material shall be applied by a squeegee to insure that the black mat is sealed.
 - 7. Line Marking Paint
 - a. All line and event markings shall be applied by experienced personnel utilizing a paint approved by the manufacturer.

PART 3 – EXECUTION

3.1 BITUMINOUS CONCRETE BASE

- A. Granular fill, processed aggregate base, and bituminous concrete shall be constructed employing the requirements of Articles 2.14.03, 3.04.03, and 4.06.03 of the Standard Specifications.

The Synthetic Track Surfacing System shall be laid on an approved subbase. The General Contractor shall provide compaction test results of 95% or greater for the installed subbase and

asphalt surface.

It should be the responsibility of the asphalt-paving contractor to flood the surface immediately after the asphalt is capable of handling traffic, but within 24 hours. If, after 20 minutes of drying time, there are birdbaths evident, it shall be the responsibility of the architect, in conjunction with the surfacing contractor to determine the method of correction. No cold tar patching, skin patching or sand mix patching will be acceptable.

Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, either by chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be one inch. The curing time for the asphalt base is 28 days. It shall be the responsibility of the surfacing contractor to determine if the asphalt substrate has cured sufficiently prior to the application of polyurethane surfacing system.

It shall be the responsibility of the general contractor to determine if the asphalt substrate meets all design specifications, i.e. cross slopes, planarity and specific project criteria. After all the above conditions are met, the synthetic surfacing contractor must, in writing, accept the planarity of the asphalt receiving base, before work can commence.

3.2 URETHANE TRACK SYSTEM

- A. The thickness of the synthetic track surfacing system shall be 13 mm.
- B. Equipment
 - 1. The Synthetic Track Surfacing System components shall be processed and installed by specially designed machinery and equipment. A mechanically operated paver with variable regulated speed and thermostatically controlled screed shall be used in the installation of the base mat and the wearing course shall be installed using automatic electronic portioning, which provides continuous mixing and feeding for an accurate, quality controlled installation.
- C. Installation
 - 1. Base Course
 - a. The SBR granules and BEYPUR shall be mixed together on site to regulate the ratio/quantity of SBR, not to exceed 82% in the base mat portion of the system. The BEYPUR shall be mixed with the SBR rubber so that a minimum of 18%, by weight, exists in the final mixture. This mixture is then mechanically installed using the paver.
 - 2. Seal Coat
 - a. The two BEYPUR 200 components are mixed at the prescribed ratio homogeneously with a suitable mixing device. The coating is squeegee applied to the base mat, making it impermeable.
 - 3. Wearing Course
 - a. The 0.5 to 1.5mm EPDM granules shall be mixed with BEYPUR, the single-component structural spray coating. The structural spray shall be made in two uniform applications.

3.3 SITE CONDITIONS

- A. Installation shall not take place if adjacent or concurrent construction generates excessive dust, abrasives or any other by-product that, in the opinion of the installer, would be harmful to the track material, until completion of such works.
- B. If, in the opinion of the installer of the synthetic material, the weather and/or climatic conditions are detrimental to the proper installation of the surfacing materials, work shall be delayed until conditions are acceptable. Preferred installation temperature is fifty degrees Fahrenheit and rising. Installation shall be executed only in dry conditions.

3.4 LINE STRIPING

- A. All lines and marking shall be painted by personnel experienced in track and field pavement markings. All lines shall be in accordance with the NCAA, IAAF, National Federation of High School Associations (NFHS), the school specifications and in accordance with the contract plans and details. All lines shall be two inches wide. All paint shall be in accordance with the surfacing manufacturer recommendations.
- B. Wait 48 hours or as recommended by the material manufacture after surface completion before applying line marking. The installer shall:
 - 1. Locate and establish all radius points.
 - 2. Establish and set all necessary control points.
 - 3. Layout all lines and markings to tolerances set forth by IAAF and governing body requirements.
 - 4. Prepare all necessary drawings.
 - 5. Provide all computations and measurements in organized form.
 - 6. Establish all locations on the curves using a Transit or Theodolite capable of reading direct to 20 seconds.
 - 7. Identify all markings, where appropriate, by painting the identification directly onto the track surface in 4" letters just below or in front of each mark in the right hand portion of the lane.
 - 8. Paint all of the large, 3' high, lane numbers in two (2) colors, utilizing shadowed backgrounds.
 - 9. All lines shall receive sufficient paint to assure complete opacity and uniformity of color.
 - 10. Paints shall be used directly from original containers and shall be thinned only when hot temperatures dictate thinning for smooth applications.
 - 11. Amount of paint used shall be as recommended by the manufacturer.
 - 12. The paint used shall be Line paint, made especially for the painting of lines on sports surfaces.
 - 13. All measurements shall be made by competent, experienced and fully qualified personnel.
 - 14. The markings shall include all events and marks required or recommended by the National Federation of State High Schools, the NCAA, or the I.A.A.F dependent on the end use of the facility.

3.4 CERTIFICATE OF ACCURACY

- A. Upon completion of the track markings, a Licensed Professional Engineer or Registered Land Surveyor shall furnish an acceptable letter of or certificate of, accuracy to the Owner attesting to the accuracy of the track markings and measurements. This will also include copies of the computations, calculations and drawings that were used to obtain this accuracy. The Engineer or Surveyor shall affix their signature and stamp to the drawing and the certificate.

3.5 MAINTENANCE DATA

- B. As part of the project closeout, a maintenance manual (five copies) shall be provided to the Owner. The manual is to describe the procedure for small repairs, stain removal, general cleaning, mechanical equipment needed, etc. Also included will be the procedure for the care of the track and D-zone on a day-to-day basis.

3.6 WARRANTY AND GUARANTEE

- A. The Contractor/ Manufacturer shall guarantee the synthetic track and D-zone surface that covers materials and workmanship of the synthetic track and D-zone surface. The Contractor/ Manufacturer shall verify in writing to the Owner that their onsite representative has inspected the installation and that the work conforms to the manufacturer's requirements.
- B. The guarantee shall be a certified written warranty furnished to the Owner for a period of 5 years from the date of Substantial Completion.

END OF SECTION 33 33 00

5660-02-a2516-specs-333300 synthetic track

SECTION 33 41 00 STORM UTILITY DRAINAGE PIPING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes gravity-flow, non-pressure storm drainage outside the building, with the following components:
 - 1. Storm drainage pipe
 - 2. Precast concrete storm drainage structures.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For manholes, Include plans, elevations, sections, details, and manhole frames and covers.
- C. Coordination Drawings: Show pipe sizes, locations, and elevations.
- D. Field quality-control test reports. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Workmen: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition with supplements shall be used for material compliance and execution of the work in this section.

PART 2 – PRODUCTS

2.1 PIPING MATERIALS

- A. All materials shall conform to the applicable sections of the Standard Specifications. Storm drainage pipe shall be as indicated on the drawings and with conforming to Article M.08. Bedding shall be No. 6 crushed stone conforming to Article M.01.01 of the Standard Specifications. Joint sealant and materials, culvert ends, and elbows or specials, shall conform to the requirements of Articles M.08 of the Standard Specifications.

2.2 MANHOLES, OUTLET STRUCTURE, CATCH BASINS AND YARD DRAINS

- A. Precast Concrete Manholes: The materials to be used for the work under this Item shall be those indicated on the Contract Drawings or ordered by the Engineer and shall conform to

Article M.08 of the Standard Specifications. Protective compound material shall conform to Article M.03.01.11 of the Standard Specifications. Mortar shall conform to article M.11.04 of the Standard Specifications. Bedding shall be No. 6 crushed stone conforming to Article M.01.01 of the Standard Specifications.

PART 3 – EXECUTION

3.1 PIPING APPLICATIONS

- A. Pipe couplings and fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.
 - 1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping, unless otherwise indicated.
 - a. Flexible couplings for same or minor difference OD pipes.
 - b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
 - c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
- B. Gravity-Flow, Nonpressure Sewer Piping: As indicated on the drawings.

3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Clear interior of piping and manholes of dirt and superfluous material as work progresses.
- F. Join gravity-flow, nonpressure drainage piping according to the following:
 - 1. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-gasket joints.
 - 2. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.3 MANHOLE INSTALLATION

- A. General: Install manholes and galleries, complete with appurtenances and accessories indicated.
- B. Install precast concrete drainage structures sections with sealants according to ASTM C 891.

3.4 CONNECTIONS

- A. Make connections to existing piping and underground manholes.
 - 1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.

3.5 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
 - 1. Submit separate report for each system inspection.
 - 2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 - 4. Re-inspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
 - 1. Do not enclose, cover, or put into service before inspection and approval.
 - 2. Test completed piping systems according to requirements of authorities having jurisdiction.
 - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
 - 4. Submit separate report for each test.
 - 5. Air Tests: Test storm drainage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
 - a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
- C. Leaks and loss in test pressure constitute defects that must be repaired.

- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION 33 41 00

5660-02-a2516-specs-334100 storm utility drainage piping

SECTION 33 42 00 TRACK EDGE DRAIN SYSTEM

PART 1 – GENERAL

1.1 SUMMARY

- A. Furnish and install a track edge drain system ("trench drain") in accordance with the dimensions and details shown on the plans or as ordered and in conformity with these specifications.

1.2 RELATED SECTIONS

- A. Section 31 20 00 Earth Moving
- B. Section 32 13 16 Cast-in-Place Concrete
- C. Section 33 41 00 Storm Utility Drainage Piping
- D. Section 33 46 00 Athletic Field Subsurface Drainage

1.3 SUBMITTALS

- A. Shop drawing for trench drain
- B. Concrete mix design

1.4 QUALITY ASSURANCE

- A. Workmen: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition with supplements shall be used for material compliance and execution of the work in this section.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. ACO 2000 Polymer Concrete Drain System, or approved equal – System of one-meter long channels of polymer concrete and drop drainage basins or approved equal.
- B. Concrete – As specified in Section 6.01 of the Standard Specifications Form 816 and Section 32 13 16.
- C. Gravel Subbase – As specified in Section 32 13 16.
- D. The Contractor shall submit shop drawings for approval in accordance with Article 1.05.02 of the

Standard Specifications Form 816 a minimum of four (4) weeks before performing this work.

- E. The drawings shall include the layout of the system showing location of in-line drain basins, material, size, elevation, slope, and other information necessary for the fabrication and installation of this item.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS

- A. The track edge drain system shall be installed at the location indicated on the plans or as directed by the Engineer. The system shall be placed on a prepared concrete bed and shall be installed straight to line and grade and in accordance to the details shown on the plans and per recommendation of the manufacturer.
- B. Since this edge drain installation is a retrofit on existing running track, best efforts were made to identify the lowest existing elevation along the inside edge of the track. This lowest elevation is what was used to establish the top of edge drain elevation for the entire length of the system, so as to not impede surface water drainage in any location. Contractor shall set string lines to this elevation and carefully examine the top of drain elevation in relation to the elevation of the adjacent track surfacing. If in any location the track edge drain elevation is higher than the adjacent track surfacing, or significantly lower (>1" difference) this should be brought to the attention of the project engineer immediately so that corrective measure can be taken.
- C. The concrete backfilling shall be placed with care to prevent any movement of the drain system.
- D. The catch basins shall be installed at the locations and in accordance to the details shown on the plans and per recommendation of the manufacturer.

END OF SECTION 33 42 00

5660-02-a2516-specs-334200 track edge drain system

SECTION 33 46 23 SYNTHETIC FIELD SUBSURFACE DRAINAGE

PART 1 – GENERAL

1.1 SUMMARY

- A. Furnish all labor, equipment, and materials to install the Athletic Field Subsurface Drainage System, consisting of perimeter underdrain/collector pipe, geotextile, and stone bases all as indicated on the Contract Drawings and as specified herein.

- B. Related Sections:
 - 1. Section 31 20 00 Earth Moving
 - 2. Section 33 32 30 Synthetic Turf
 - 3. Section 33 41 00 Storm Utility Drainage Piping
 - 4. Section 33 42 00 Track Edge Drain System

1.2 REFERENCES

- A. Comply with applicable requirements of the following standards. Should the standards conflict with other specified requirements, the most restrictive requirement shall govern.
 - 1. American Association of State Highway and Transportation Officials (AASHTO).
 - 2. American Society for Testing and Materials (ASTM):
 - F 405 Corrugated Polyethylene (PE) Tubing and Fittings
 - F 449 Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control
 - F 667 8-, 10-, 12-, and 15-inch Corrugated Polyethylene Tubing and Fittings
 - 3. State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction – Form 816 dated 2004, with latest Supplements, herein referred to as the Standard Specifications.
 - 4. Occupational Safety and Health Administration (OSHA)

1.3 SUBMITTALS

- A. Provide Shop Drawings for all material to be supplied.

- B. Provide certifications stating that the materials used to comprise the system comply with the requirements.

- C. Provide laboratory test results for sieve analysis, resistance to abrasion, and soundness for all stone materials.

- D. Record Drawings: Submit as-builts of the subbase prior to installation of the resilient polypropylene base. The record drawing of the subbase must be accepted by the engineer/landscape architect prior to work in section being considered complete.

1.4 QUALITY ASSURANCE

- A. Workmen: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Codes and Standards: All materials and construction methods shall conform to the Town of Monroe standards and Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition with supplements shall be used for material compliance and execution of the work in this section.
- C. All piping and appurtenances shall be new, clean, and in accordance with material specifications, unless specifically noted on the plans.
- D. Pipe size and classification shall be as shown on the plans or as specified herein.
- E. Stone base material gradations shall be submitted for review prior to delivery of any material.

1.5 PRODUCT DELIVERY

- A. Take all required measures to ensure that all piping and related appurtenances are protected from damage.
- B. Special care shall be exercised during delivery and storage to avoid damage or contamination to the products.
- C. All materials shall be delivered and stored within the Contractor's work limits or in an area approved by the Owner.
- D. Products that are damaged will be removed and replaced unless the product can be repaired in a manner acceptable to the Owner
- E. Protect aggregates and base materials from soil contamination.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Perimeter Underdrain/ Collector Pipe:
 - 1. All specific pipe sizes are noted on the Contract Drawings.
 - 2. 4" through 10" solid wall and perforated drain pipe shall be smooth interior wall conforming to AASHTO M 252, Hi-Q, as manufactured by Hancor, Inc., Findlay, Ohio or an approved equal.

3. 12" through 36" solid wall and perforated drain pipe shall be smooth interior wall conforming to AASHTO M 294 Type S, Hi-Q, as manufactured by Hancor, Inc., Findlay, Ohio or an approved equal.
 4. Fittings and couplers shall be split couplings or snap couplings manufactured by the same manufacturer as the corrugated polyethylene pipe.
 5. Approved Equal - ADS N-12 as manufactured by Advanced Drainage Systems.
 6. Underdrain/Collector Pipe bedding shall conform to #8 stone of the requirements of Article M01.01 of the Standard Specifications.
- B. Nonwoven geotextile and shall be a nonwoven needle-punched construction and consist of long-chain polymeric fibers composed of polypropylene, polyethylene, or polyamide. The fibers shall be oriented into a multidirectional stable network whereby they retain their positions relative with each other and allow the passage of water as specified. The fabric shall be free of any chemical treatment or coating that reduces permeability and shall be inert to chemicals commonly found in soil. The geotextile shall conform to the following minimum average roll values:

| | | |
|--------------------------------|-------------|------------------------------|
| Weight | ASTM D-3776 | 4.0 |
| Tensile Strength | ASTM D-4632 | 100 |
| Elongation % | ASTM D-4632 | 50 |
| Puncture, lb | ASTM D-751 | 50 |
| Mullen Burst, psi | ASTM D-3786 | 200 |
| Trapezoidal Tear, lb | ASTM D-4533 | 42 |
| Coefficient of Permeability | ASTM D-4491 | .1 cm/sec |
| Flow Rate, gpm/ft ² | ASTM D-4491 | 100 |
| Permittivity, 1/sec | ASTM D-4491 | 1.8 |
| Apparent Opening Size | ASTM D-4751 | 70 Max. US Std Sieve Opening |
| Seam Strength, lb/ft | ASTM D-4595 | 100 |
| Fungus | ASTM G-21 | No growth |

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine the areas and conditions under which the subsurface drainage system work is to be installed. Correct any and all conditions detrimental to the proper completion of the work. Do not proceed with the work until satisfactory conditions have been achieved.
- B. Provide a survey of the finished subbase prior to installation of the resilient polypropylene base for review and approval by the engineer. The as-built shall indicate spot elevations 25 feet on center, including elevations at the crown along the entire length of the subgrade. Correct all deficiencies as necessary.

- C. Do not proceed with any installations before receiving written approval from the Owner for the material.

3.2 PERIMETER UNDERDRAIN/COLLECTOR PIPE

- A. Install pipe and bedding in conformance with the Storm Drainage requirements of these specifications and as recommended by the pipe manufacturer.
- B. Excavation for installation of pipes shall be in trenches to the lines, grades and widths as per the Contract Drawings and in accordance with Safety and Health Regulations (OSHA).
- C. After installation of pipe, inspect to determine whether line displacement or other damage has occurred.
- D. Make inspections after lines have been installed prior to backfilling and during the backfilling process and again at the completion of backfilling. Backfill material shall conform to the material as specified on the contract drawings.
- E. If inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects, take whatever steps are necessary to correct such defects.

3.3 STONE BASES

- A. Upon the completion of constructing an approved field subgrade, the Contractor shall install the stone base layer and top stone finishing layer.
- B. The surface of the stone base layer shall be formed to meet the design elevations to within 1/2", and the surface shall not deviate more than 1/4" over 10' in any direction.
- C. Check surface tolerance prior to installation of geotextile fabric and resilient polypropylene shock/drainage pad.
- D. Provide a survey of the stone base prior to installation of the geotextile fabric and resilient polypropylene shock/drainage pad for review and approval by the engineer and synthetic turf vendor/installer. The as-built shall indicate spot elevations 25 feet on center, including elevations at the crown along the entire length of the base. Correct all deficiencies as necessary.

3.4 GEOTEXTILE

- A. The geotextile fabric shall be installed as per Manufacturer's recommendations on the entire surface of the finished stone base.

END OF SECTION 33 46 23

5660-02-a2516-specs-334623 subsurface drainage system

SECTION VIII

Prevailing Wage Rates

Project: Masuk High School Track And Field Improvements

**Minimum Rates and Classifications
for Heavy/Highway Construction**

**Connecticut Department of Labor
Wage and Workplace Standards Division**

ID#: H 22041

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: 5660-02

Project Town: Monroe

FAP Number:

State Number:

Project: Masuk High School Track And Field Improvements

CLASSIFICATION

Hourly Rate

Benefits

01) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. **See Laborers Group 5 and 7**

| | | |
|----------------|-------|------------|
| 1) Boilermaker | 33.79 | 34% + 8.96 |
|----------------|-------|------------|

| | | |
|---|-------|-------|
| 1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons | 33.48 | 28.76 |
|---|-------|-------|

| | | |
|------------------------------|-------|-------|
| 2) Carpenters, Piledrivermen | 31.45 | 23.54 |
|------------------------------|-------|-------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|-------------------|-------|-------|
| 2a) Diver Tenders | 31.45 | 23.54 |
|-------------------|-------|-------|

| | | |
|-----------|-------|-------|
| 3) Divers | 39.91 | 23.54 |
|-----------|-------|-------|

| | | |
|------------------|-------|-------|
| 03a) Millwrights | 31.84 | 23.99 |
|------------------|-------|-------|

| | | |
|--|-------|-------|
| 4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray | 45.95 | 19.35 |
|--|-------|-------|

| | | |
|--------------------------------|-------|-------|
| 4a) Painters: Brush and Roller | 31.52 | 19.35 |
|--------------------------------|-------|-------|

| | | |
|--------------------------|-------|-------|
| 4b) Painters: Spray Only | 34.52 | 19.35 |
|--------------------------|-------|-------|

| | | |
|--------------------------|-------|-------|
| 4c) Painters: Steel Only | 33.02 | 18.55 |
|--------------------------|-------|-------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|-------------------------------|-------|-------|
| 4d) Painters: Blast and Spray | 34.52 | 19.35 |
|-------------------------------|-------|-------|

| | | |
|--------------------------------------|-------|-------|
| 4e) Painters: Tanks, Tower and Swing | 33.52 | 19.35 |
|--------------------------------------|-------|-------|

| | | |
|--|-------|--------------------------|
| 5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9) | 37.62 | 23.00 + 3% of gross wage |
|--|-------|--------------------------|

| | | |
|--|-------|-----------|
| 6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection | 34.47 | 31.09 + a |
|--|-------|-----------|

| | | |
|--|-------|-------|
| 7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9) | 40.62 | 28.91 |
|--|-------|-------|

---LABORERS----

| | | |
|---|-------|-----------|
| 8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist | 28.55 | 18.90 + a |
|---|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| 9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen | 28.80 | 18.90 + a |
|---|-------|-----------|

| | | |
|-------------------------|-------|-----------|
| 10) Group 3: Pipelayers | 29.05 | 18.90 + a |
|-------------------------|-------|-----------|

| | | |
|--|-------|-----------|
| 11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators | 29.05 | 18.90 + a |
|--|-------|-----------|

| | | |
|---|-------|-----------|
| 12) Group 5: Toxic waste removal (non-mechanical systems) | 30.55 | 18.90 + a |
|---|-------|-----------|

| | | |
|-----------------------|-------|-----------|
| 13) Group 6: Blasters | 30.30 | 18.90 + a |
|-----------------------|-------|-----------|

| | | |
|---|-------|-----------|
| Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe) | 29.55 | 18.90 + a |
|---|-------|-----------|

| | | |
|------------------------------------|-------|-----------|
| Group 8: Traffic control signalmen | 16.00 | 18.90 + a |
|------------------------------------|-------|-----------|

Project: Masuk High School Track And Field Improvements

| | | |
|---------------------------|-------|-----------|
| Group 9: Hydraulic Drills | 29.30 | 18.90 + a |
|---------------------------|-------|-----------|

---LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and
Liner Plate Tunnels in Free Air.---

| | | |
|---|-------|-----------|
| 13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders | 32.22 | 18.90 + a |
|---|-------|-----------|

| | | |
|-------------------------|-------|-----------|
| 13b) Brakemen, Trackmen | 31.28 | 18.90 + a |
|-------------------------|-------|-----------|

---CLEANING, CONCRETE AND CAULKING TUNNEL---

| | | |
|--|-------|-----------|
| 14) Concrete Workers, Form Movers, and Strippers | 31.28 | 18.90 + a |
|--|-------|-----------|

| | | |
|-------------------|-------|-----------|
| 15) Form Erectors | 31.60 | 18.90 + a |
|-------------------|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

---ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL
IN FREE AIR:----

| | | |
|---|-------|-----------|
| 16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers | 31.28 | 18.90 + a |
|---|-------|-----------|

| | | |
|---|-------|-----------|
| 17) Laborers Topside, Cage Tenders, Bellman | 31.17 | 18.90 + a |
|---|-------|-----------|

| | | |
|------------|-------|-----------|
| 18) Miners | 32.22 | 18.90 + a |
|------------|-------|-----------|

---TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED
AIR: ----

| | | |
|--------------|-------|-----------|
| 18a) Blaster | 38.53 | 18.90 + a |
|--------------|-------|-----------|

| | | |
|---|-------|-----------|
| 19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders | 38.34 | 18.90 + a |
|---|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| 20) Change House Attendants, Powder Watchmen, Top on Iron Bolts | 36.41 | 18.90 + a |
|---|-------|-----------|

| | | |
|------------------------------|-------|-----------|
| 21) Mucking Machine Operator | 39.11 | 18.90 + a |
|------------------------------|-------|-----------|

---TRUCK DRIVERS---(*see note below)

| | | |
|-----------------|-------|-----------|
| Two axle trucks | 28.83 | 21.39 + a |
|-----------------|-------|-----------|

| | | |
|---------------------------------------|-------|-----------|
| Three axle trucks; two axle ready mix | 28.93 | 21.39 + a |
|---------------------------------------|-------|-----------|

| | | |
|----------------------|-------|-----------|
| Three axle ready mix | 28.98 | 21.39 + a |
|----------------------|-------|-----------|

| | | |
|--|-------|-----------|
| Four axle trucks, heavy duty trailer (up to 40 tons) | 29.03 | 21.39 + a |
|--|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| Four axle ready-mix | 29.08 | 21.39 + a |
| <hr/> | | |
| Heavy duty trailer (40 tons and over) | 29.28 | 21.39 + a |
| <hr/> | | |
| Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids) | 29.08 | 21.39 + a |
| <hr/> | | |
| ---POWER EQUIPMENT OPERATORS--- | | |
| <hr/> | | |
| Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required) | 38.55 | 23.55 + a |
| <hr/> | | |
| Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required) | 38.23 | 23.55 + a |
| <hr/> | | |
| Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required) | 37.49 | 23.55 + a |
| <hr/> | | |

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper) | 37.10 | 23.55 + a |
|---|-------|-----------|

| | | |
|--|-------|-----------|
| Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell) | 36.51 | 23.55 + a |
|--|-------|-----------|

| | | |
|--|-------|-----------|
| Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller. | 36.51 | 23.55 + a |
|--|-------|-----------|

| | | |
|---|-------|-----------|
| Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer). | 36.20 | 23.55 + a |
|---|-------|-----------|

| | | |
|---|-------|-----------|
| Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and Under Mandrel). | 35.86 | 23.55 + a |
|---|-------|-----------|

| | | |
|--|-------|-----------|
| Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine. | 35.46 | 23.55 + a |
|--|-------|-----------|

| | | |
|--|-------|-----------|
| Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder). | 35.03 | 23.55 + a |
|--|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc. 32.99 23.55 + a

Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment. 32.99 23.55 + a

Group 12: Wellpoint Operator. 32.93 23.55 + a

Group 13: Compressor Battery Operator. 32.35 23.55 + a

Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain). 31.21 23.55 + a

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator. 30.80 23.55 + a

Group 16: Maintenance Engineer/Oiler 30.15 23.55 + a

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator. | 34.46 | 23.55 + a |
|---|-------|-----------|

| | | |
|---|-------|-----------|
| Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license). | 32.04 | 23.55 + a |
|---|-------|-----------|

**NOTE: SEE BELOW

---LINE CONSTRUCTION---(Railroad Construction and Maintenance)---

| | | |
|--|-------|-------------|
| 20) Lineman, Cable Splicer, Technician | 45.43 | 6.25%+19.20 |
|--|-------|-------------|

| | | |
|------------------------------|-------|-------------|
| 21) Heavy Equipment Operator | 40.89 | 6.25%+17.18 |
|------------------------------|-------|-------------|

| | | |
|--|-------|-------------|
| 22) Equipment Operator, Tractor Trailer Driver, Material Men | 38.62 | 6.25%+16.68 |
|--|-------|-------------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|----------------------|-------|-------------|
| 23) Driver Groundmen | 24.99 | 6.25%+10.87 |
|----------------------|-------|-------------|

| | | |
|-------------------|-------|-------------|
| 23a) Truck Driver | 34.07 | 6.25%+15.41 |
|-------------------|-------|-------------|

---LINE CONSTRUCTION---

| | | |
|----------------------|-------|-------------|
| 24) Driver Groundmen | 30.92 | 6.5% + 9.70 |
|----------------------|-------|-------------|

| | | |
|---------------|-------|-------------|
| 25) Groundmen | 22.67 | 6.5% + 6.20 |
|---------------|-------|-------------|

| | | |
|-------------------------------|-------|--------------|
| 26) Heavy Equipment Operators | 37.10 | 6.5% + 10.70 |
|-------------------------------|-------|--------------|

| | | |
|---|-------|--------------|
| 27) Linemen, Cable Splicers, Dynamite Men | 41.22 | 6.5% + 12.20 |
|---|-------|--------------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

28) Material Men, Tractor Trailer Drivers, Equipment Operators

35.04

6.5% + 10.45

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.*

***Note: Hazardous waste premium \$3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$3.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - \$1.50 extra

Crane with 200 ft. boom (including jib) - \$2.50 extra

Crane with 250 ft. boom (including jib) - \$5.00 extra

Crane with 300 ft. boom (including jib) - \$7.00 extra

Crane with 400 ft. boom (including jib) - \$10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of:

Friday, April 22, 2016



Opportunity * Guidance * Support



THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

**If you have QUESTIONS regarding your wages
CALL (860) 263-6790**

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

Sec. 31-53b. Construction safety and health course. New miner training program. Proof of completion required for mechanics, laborers and workers on public works projects. Enforcement. Regulations. Exceptions. (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (g) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any person required to complete a course or program under subsection (a) of this section who has not completed the course or program shall be subject to removal from the worksite if the person does not provide documentation of having completed such course or program by the fifteenth day after the date the person is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2009, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) This section shall not apply to employees of public service companies, as defined in section 16-1, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

(P.A. 06-175, S. 1; P.A. 08-83, S. 1.)

History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g), requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting "person" for "employee" and adding "or program", amended Subsec. (c) by adding "or in accordance with Federal Mine Safety and Health Administration Standards" and setting new deadline of January 1, 2009, deleted former Subsec. (d) re "public building", added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007*, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

November 29, 2006

Notice
To All Mason Contractors and Interested Parties
Regarding Construction Pursuant to Section 31-53 of the
Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.
- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

STATUTE 31-55a

- SPECIAL NOTICE -

To: All State and Political Subdivisions, Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the **contractor's** responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. For those without internet access, please contact the division listed below.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.

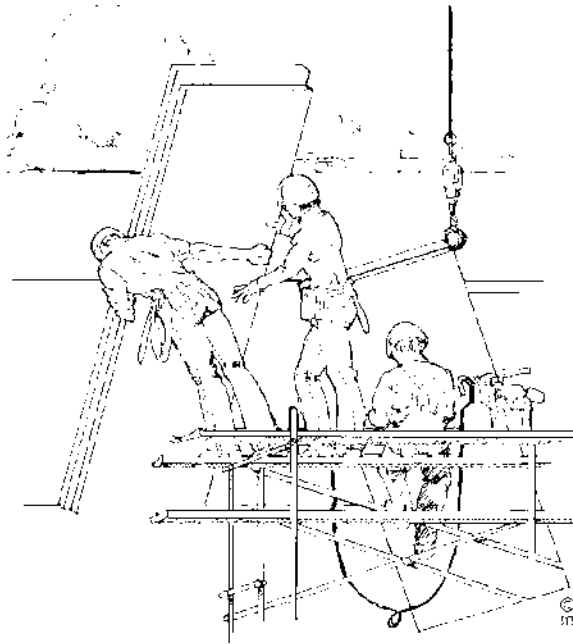
~NOTICE~

TO ALL CONTRACTING AGENCIES

Please be advised that Connecticut General Statutes Section 31-53, requires the contracting agency to certify to the Department of Labor, the total dollar amount of work to be done in connection with such public works project, regardless of whether such project consists of one or more contracts.

Please find the attached “Contracting Agency Certification Form” to be completed and returned to the Department of Labor, Wage and Workplace Standards Division, Public Contract Compliance Unit.

 Inquiries can be directed to (860)263-6543.



CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION
CONTRACT COMPLIANCE UNIT

CONTRACTING AGENCY CERTIFICATION FORM

I, _____, acting in my official capacity as _____,
authorized representative title

for _____, located at _____,
contracting agency address

do hereby certify that the total dollar amount of work to be done in connection with
_____, located at _____,
project name and number address

shall be \$_____, which includes all work, regardless of whether such project
consists of one or more contracts.

CONTRACTOR INFORMATION

Name: _____

Address: _____

Authorized Representative: _____

Approximate Starting Date: _____

Approximate Completion Date: _____

Signature

Date

Return To: Connecticut Department of Labor
Wage & Workplace Standards Division
Contract Compliance Unit
200 Folly Brook Blvd.
Wethersfield, CT 06109

Date Issued: _____

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM
Construction Manager at Risk/General Contractor/Prime Contractor

I, _____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

Street

City

and all of its subcontractors will pay all workers on the

Project Name and Number

Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

Signed

Subscribed and sworn to before me this _____ day of _____, _____.

Notary Public

Return to:
Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

In accordance with Connecticut General Statutes, 31-53 Certified Payrolls with a statement of compliance shall be submitted monthly to the contracting agency.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

Connecticut Department of Labor
Wage and Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

WEEKLY PAYROLL

| CONTRACTOR NAME AND ADDRESS: | | | | | | | | | | | SUBCONTRACTOR NAME & ADDRESS | | | | | WORKER'S COMPENSATION INSURANCE CARRIER | | | | |
|------------------------------------|-------------|-----------------------|--|-----------------------|---|---|---|----|---|---|------------------------------|------------------|---|--|------------------|---|--------------------|------------|--|---------------------|
| PAYROLL NUMBER | | Week-Ending Date | PROJECT NAME & ADDRESS | | | | | | | | POLICY # | | | | | EFFECTIVE DATE: EXPIRATION DATE: | | | | |
| PERSON/WORKER, ADDRESS and SECTION | APPR RATE % | MALE/FEMALE AND RACE* | WORK CLASSIFICATION | DAY AND DATE | | | | | | | Total ST Hours | BASE HOURLY RATE | TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back) | GROSS PAY FOR ALL WORK PERFORMED THIS WEEK | TOTAL DEDUCTIONS | | | | GROSS PAY FOR THIS PREVAILING RATE JOB | CHECK # AND NET PAY |
| | | | | S | M | T | W | TH | F | S | Total O/T Hours | | | | FICA | FEDERAL WITH-HOLDING | STATE WITH-HOLDING | LIST OTHER | | |
| | | | Trade License Type & Number - OSHA 10 Certification Number | HOURS WORKED EACH DAY | | | | | | | | \$ | 1. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 2. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 3. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 4. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 5. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 6. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 1. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 2. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 3. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 4. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 5. \$ | | | | | | | |
| | | | | | | | | | | | | \$ | 6. \$ | | | | | | | |

12/9/2013 *IF REQUIRED

*SEE REVERSE SIDE

PAGE NUMBER ____ OF

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker’s compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care _____ 4) Disability _____
- 2) Pension or retirement _____ 5) Vacation, holiday _____
- 3) Life Insurance _____ 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____ of _____, (hereafter known as Employer) in my capacity as _____ (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such person is covered by a worker’s compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such persons name first appears.

_____ Submitted on (Date)

(Signature) (Title)

[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

| PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS | | | | | | | | | | | Connecticut Department of Labor Wage and Workplace Standards Division 200 Folly Brook Blvd. Wethersfield, CT 06109 | | | | | | | | | |
|--|------------------|------------------------|---|----|----|--|----|----|-----------------------|--------|---|--------------------------------|---|--|------------------|--------------|--------------|------------|--|---------------------|
| In accordance with Connecticut General Statutes, 31-53 Certified Payrolls with a statement of compliance shall be submitted monthly to the contracting agency. | | | | | | | | | | | WEEKLY PAYROLL | | | | | | | | | |
| CONTRACTOR NAME AND ADDRESS: Landon Corporation, 15 Connecticut Avenue, Northford, CT 06472 | | | | | | SUBCONTRACTOR NAME & ADDRESS XYZ Corporation 2 Main Street Yantic, CT 06389 | | | | | WORKER'S COMPENSATION INSURANCE CARRIER Travelers Insurance Company POLICY # #BAC8888928 EFFECTIVE DATE: 1/1/09 EXPIRATION DATE: 12/31/09 | | | | | | | | | |
| PAYROLL NUMBER | Week-Ending Date | PROJECT NAME & ADDRESS | | | | | | | | | Total ST Hours | BASE HOURLY RATE | TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back) | GROSS PAY FOR ALL WORK PERFORMED THIS WEEK | TOTAL DEDUCTIONS | | | | GROSS PAY FOR THIS PREVAILING RATE JOB | CHECK # AND NET PAY |
| | | DAY AND DATE | | | | | | | HOURS WORKED EACH DAY | | | | | | FICA | WITH-HOLDING | WITH-HOLDING | LIST OTHER | | |
| PERSON/WORKER, ADDRESS and SECTION | APPR RATE % | MALE/FEMALE AND RACE* | WORK CLASSIFICATION | S | M | T | W | TH | F | S | Total O/T Hours | TOTAL FRINGE BENEFIT PLAN CASH | | | | | | | | |
| Robert Craft 81 Maple Street Willimantic, CT 06226 | | M/C | Electrical Lineman E-1 1234567 Owner OSHA 123456 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 40 | S-TIME | 1. \$ 5.80 | \$1,582.80 | | | | P-xxxx | \$1,582.80 | #123 |
| | | | | | 8 | 8 | 8 | 8 | 8 | O-TIME | | 2. \$ | | | | | | | | |
| | | | | | | | | | | | | 3. \$ 2.01 | | | | | | | | |
| | | | | | | | | | | | | 4. \$ | | | | | | | | |
| | | | | | | | | | | | | 5. \$ | | | | | | | | |
| | | | | | | | | | | | | 6. \$ | | | | | | | | |
| Ronald Jones 212 Elm Street Norwich, CT 06360 | 65% | M/B | Electrical Apprentice OSHA 234567 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 40 | S-TIME | 1. \$ | \$1,464.80 | xx.xx | xxx.xx | xx.xx | G-xxx | \$1,464.80 | #124 |
| | | | | | 8 | 8 | 8 | 8 | 8 | O-TIME | | 2. \$ | | | | | | | | |
| | | | | | | | | | | | | 3. \$ | | | | | | | | |
| | | | | | | | | | | | | 4. \$ | | | | | | | | |
| | | | | | | | | | | | | 5. \$ | | | | | | | | |
| | | | | | | | | | | | | 6. \$ | | | | | | | | |
| Franklin T. Smith 234 Washington Rd. New London, CT 06320 SECTION B | | M/H | Project Manager | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 8 | S-TIME | 1. \$ | \$1,500.00 | xx.xx | xx.xx | xx.xx | M-xx.x | | xxx.xx |
| | | | | | | | | | | O-TIME | | 2. \$ | | | | | | | | |
| | | | | | | | | | | | | 3. \$ | | | | | | | | |
| | | | | | | | | | | | | 4. \$ | | | | | | | | |
| | | | | | | | | | | | | 5. \$ | | | | | | | | |
| | | | | | | | | | | | | 6. \$ | | | | | | | | |
| | | | | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | S-TIME | 1. \$ | | | | | | | |
| | | | | | | | | | | O-TIME | | 2. \$ | | | | | | | | |
| | | | | | | | | | | | | 3. \$ | | | | | | | | |
| | | | | | | | | | | | | 4. \$ | | | | | | | | |
| | | | | | | | | | | | | 5. \$ | | | | | | | | |
| | | | | | | | | | | | | 6. \$ | | | | | | | | |

7/13/2009 *IF REQUIRED
WWS-CP1

*SEE REVERSE SIDE

PAGE NUMBER 1 OF 2

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker's compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care Blue Cross 4) Disability _____
- 2) Pension or retirement _____ 5) Vacation, holiday _____
- 3) Life Insurance Utopia 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of 9/26/09,

I, Robert Craft of XYZ Corporation, (hereafter known as

Employer) in my capacity as Owner (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such employee of the Employer is covered by a worker's compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such employee's name first appears.

Robert Craft owner 10/2/09
 (Signature) (Title) Submitted on (Date)

Section B: Applies to CONNDOT Projects ONLY

That pursuant to CONNDOT contract requirements for reporting purposes only, all employees listed under Section B who performed work on this project are not covered under the prevailing wage requirements defined in Connecticut General Statutes Section 31-53.

Robert Craft owner 10/2/09
 (Signature) (Title) Submitted on (Date)

Note: CTDOL will assume all hours worked were performed under Section A unless clearly delineated as Section B WWS-CP1 as such. Should an employee perform work under both Section A and Section B, the hours worked and wages paid must be segregated for reporting purposes.

*****THIS IS A PUBLIC DOCUMENT***
DO NOT INCLUDE SOCIAL SECURITY NUMBERS**

**Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES**

⇒ Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

- a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

- a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year’s Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

- a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

- a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

- a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

SECTION IX

Geotechnical Report and Test Pit Investigation

DR. CLARENCE WELTI, P.E., P.C.

GEOTECHNICAL ENGINEERING

227 Williams Street · P.O. Box 397
Glastonbury, CT 06033-0397

(860) 633-4623 / FAX (860) 657-2514

October 19, 2015

Mr. Dan Kroeber, P.E., Associate
Milone & McBroom
99 Realty Drive
Cheshire Connecticut 06410

Re: Geotechnical Study for Proposed Athletic Field Light Poles and Track and Field Improvements, Musak High School, 1014 Monroe Turnpike, Monroe, CT

Dear Mr. Kroeber:

1.0 Herewith are the data from the test borings taken at the above referenced site. Three borings were drilled at proposed light pole locations to a depth of 21.5 feet below the existing grades. The fourth light pole (i.e., the pole at northeast corner of track) was located within an existing slope and could not be safely accessed by the drilling rig. Four borings were drilled to a depth of 30" within the existing field track to evaluate the pavement cross section and to obtain soil samples for laboratory tests. The boring locations are shown on the attached plan. *The borings were drilled and sampling was conducted by this firm solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.* Grain size gradation tests were performed on 4 soil samples taken from the track borings. The results of those tests are included with the boring logs.

2.0 The **Subject Project** will include the construction of four new light poles around the existing track, the installation a new synthetic turf field and improvements to the track. It is assumed that the poles will have heights ranging from 70 to 90 feet.

3.0 The natural inorganic soils are from glacial lake deposits. These deposits consist generally of fine to coarse sand, little silt and gravel, few cobbles and boulders to the top of bedrock. Bedrock was not encountered within 20 feet of the existing grades.

3.1 The **Soils Cross Sections** from the test borings is generally as follows:

Light Pole Locations (see borings B-1 thru B-3):

At B-1 & B-2, on west side of track

Topsoil to 7"

FILL(see boring B-1); fine to coarse SAND, some Silt, little Gravel, trace Asphalt to 4 feet, medium compact

At boring B-2; fine to medium SAND, little Silt to 10 feet, medium compact

Fine to coarse SAND, little to some Gravel, little Silt, few Cobbles and Boulders to 21.5+ feet, dense

At B-3, on east side of track

Topsoil to 6"

FILL; fine to coarse SAND, some Silt, little Gravel, trace Asphalt, Wood and Concrete to 6 feet atop fine to medium SAND, some Silt, trace Wood and Roots to 11.5 feet, loose to medium compact

Fine to coarse SAND, little Gravel, trace Silt, few Cobbles to 15 feet, medium compact

Fine to medium SAND, little Silt to 21.5+ feet, medium compact

Field Track (see borings B-4 thru B-7):

Rubber Track Surface to 0.5"

Bituminous Concrete to 4" (3.5" thickness)

Fine to coarse SAND and GRAVEL, trace Silt, trace Concrete, Brick, Asphalt and Plastic to 12" to 15"

Fine to coarse SAND, trace Silt and Gravel to 2.5+ feet, dense

3.2 The **Water Table** was evident at 10 to 20 feet below the existing grades at the completion of the borings.

4.0 In general the criteria for light pole support is that the foundation capacity would exceed the loads, which might collapse the pole. **Movements from strains in the soils should be limited to differential settlement and lateral movements not to exceed ½".**

5.0 The light pole foundation type could be one of the following:

1. Caisson of Drilled Pier type foundation

2. Direct burial type pole installed in a cased hole

5.0 The design for both the drilled pier and direct burial type foundations can be based on the parameters cited in the table of section 5.1 below. *The required size and depths for the drilled piers or direct burial poles must be determined by the design engineer from a lateral analysis based on the final design loading and performance criteria.* The annular space between the direct burial pole precast foundations and the boreholes shall be backfilled with concrete. A temporary casing will be required to keep the drill holes open.

5.1 The following is a summary of design parameters which can be used to evaluate lateral deflections with the ENSOFT L Pile computer program or similar programs:

| stratum depth | Total Unit Weight (pcf) | Effective (submerged) Unit Weight (pcf) | Friction Angle degrees | Cohesion (psf) | Soil Modulus Parameter, k - above groundwater (pci) | Soil Modulus Parameter, k - below groundwater (pci) |
|--|-------------------------|---|------------------------|----------------|---|---|
| Boring Number B-1 - bottom of boring at 21.5', groundwater at 10 feet below existing grade at completion of boring | | | | | | |
| 0 to 4.0' Fill; fine to coarse SAND, some Silt, little Gravel, trace Asphalt | 120 | 58 | 30 | - | 25 | 20 |
| 4.0' to 21.5+' fine to coarse SAND, some Gravel, little Silt, few Cobbles, and Boulders | 130 | 68 | 34 | - | 200 | 125 |
| Boring Number B-2 - bottom of boring at 21.5', groundwater at 18 feet below existing grade at completion of boring | | | | | | |
| 0' to 10.0' fine to medium SAND, little Silt | 120 | 58 | 32 | - | 90 | 60 |
| 10.0' to 21.5+' fine to coarse SAND, little Silt and Gravel, few Cobbles | 130 | 68 | 34 | - | 200 | 125 |
| Boring Number B-3 - bottom of boring at 21.5', groundwater at 8.5' below existing grade at completion of boring | | | | | | |
| 0' to 6.0' FILL; fine to coarse SAND, some Silt, little Gravel, trace Asphalt, Wood, Concrete | 120 | 58 | 30 | - | 60 | 40 |
| 6.0' to 11.5' FILL; fine to medium SAND and SILT, trace Wood and Roots | 115 | 55 | 28 | - | 25 | 20 |
| 11.5' to 15' fine to coarse SAND, little Gravel, trace Silt, few Cobbles | 125 | 63 | 32 | - | 90 | 60 |
| 15.0' to 21.5+' fine to medium SAND, little Silt | 125 | 63 | 32 | - | 90 | 60 |

5.2 The soils to about 3 feet below the finished grades should be ignored in the calculation of the lateral resistance.

6.0 The natural soils at the subject site are in OSHA Class C which will require excavations that are in excess of 5 feet to have slopes which are less than 34° from the horizontal (i.e., 1.5H :1V).

7.0 This report has been prepared for specific application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

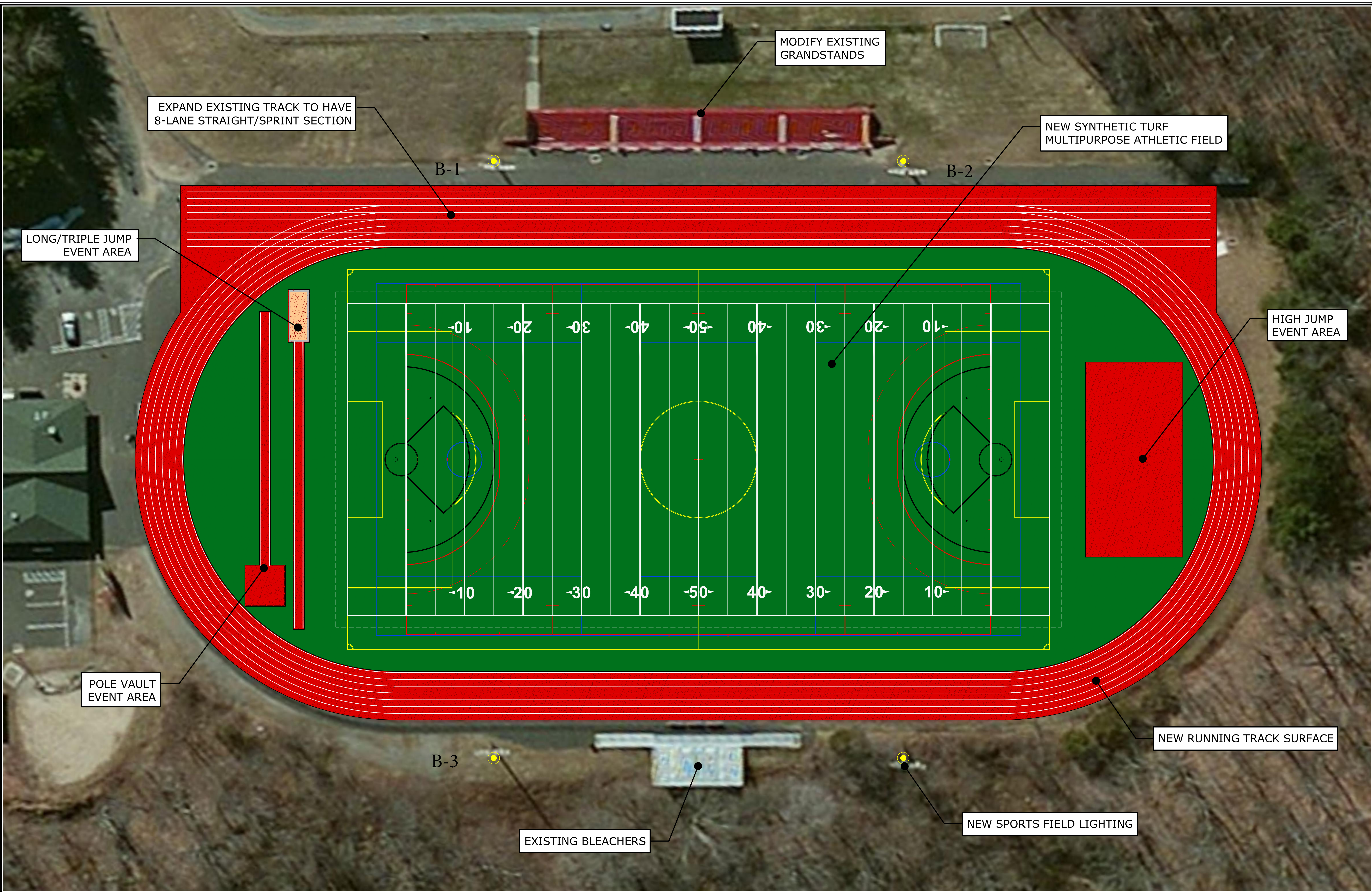
Dr. Clarence Welti, P.E., P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended.

If you have any questions please call me.

Very truly yours,

A handwritten signature in cursive script that reads "Max Welti".

Max Welti, P.E.



EXPAND EXISTING TRACK TO HAVE 8-LANE STRAIGHT/SPRINT SECTION

MODIFY EXISTING GRANDSTANDS

NEW SYNTHETIC TURF MULTIPURPOSE ATHLETIC FIELD

LONG/TRIPLE JUMP EVENT AREA

HIGH JUMP EVENT AREA

POLE VAULT EVENT AREA

NEW RUNNING TRACK SURFACE

EXISTING BLEACHERS

NEW SPORTS FIELD LIGHTING

B-1

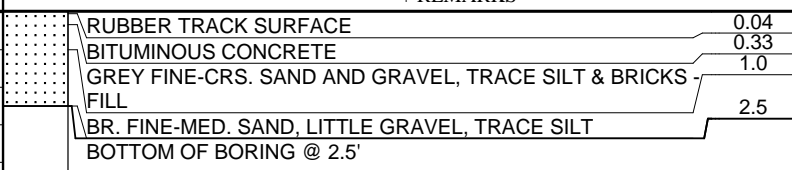
B-2

B-3

| | | | | | | | | | |
|--|--------|-------------|---------------|--|--|---------------------------------|---|--|--|
| CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033 | | | | CLIENT MILONE & MACBROOM, INC. | | | PROJECT NAME MASUK HIGH SCHOOL | | |
| | | | | | | | LOCATION 1014 MONROE TURNPIKE, MONROE, CT. | | |
| | AUGER | CASING | SAMPLER | CORE BAR. | OFFSET | SURFACE ELEV. | HOLE NO. B-1 | | |
| TYPE | HSA | | SS | | LINE & STA. | GROUND WATER OBSERVATIONS | | START DATE | |
| SIZE I.D. | 3.75" | | 1.375" | | N. COORDINATE | AT 10.0 FT. AFTER | 0 HOURS | 10/12/15 | |
| HAMMER WT. | | | 140 lbs | | E. COORDINATE | AT | FT. AFTER | HOURS | |
| HAMMER FALL | | | 30" | | | | | FINISH DATE | |
| | | | | | | | | 10/12/15 | |
| DEPTH | SAMPLE | | | A | STRATUM DESCRIPTION + REMARKS | | | ELEV. | |
| | NO. | BLOWS/6" | DEPTH | | | | | | |
| 0 | 1 | 2-4-6-7 | 0.00'-2.00' | | TOPSOIL BR. FINE-MED. SAND, SOME SILT, LITTLE GRAVEL, TRACE | | | 0.56 | |
| | | | | | | | | ASPHALT - FILL BR. FINE-CRS. SAND, SOME SILT, LITTLE GRAVEL | |
| | 2 | 3-3-11-13 | 2.00'-4.00' | | | | | | |
| 5 | 3 | 14-22-40-60 | 4.00'-5.42' | | GREY/BR. FINE-CRS. SAND, SOME GRAVEL, LITTLE SILT, FEW COBBLES & BOULDERS | | | 4.0 | |
| | | | | | | | | | |
| 10 | 4 | 12-18-19 | 10.00'-11.50' | | | | | | |
| 15 | 5 | 37-60 | 15.00'-15.92' | | | | | | |
| 20 | 6 | 15-20-35 | 20.00'-21.50' | | BOTTOM OF BORING @ 21.5' | | | 21.5 | |
| | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| LEGEND: COL. A: SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50% | | | | | | DRILLER: T. CZMYR INSPECTOR: | | | |
| | | | | | | SHEET 1 OF 1 | HOLE NO. B-1 | | |

| CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033 | | | | CLIENT MILONE & MACBROOM, INC. | | | PROJECT NAME MASUK HIGH SCHOOL | | |
|--|--------|-----------|---------------|--|---|---------------------------------|---|-------------|--|
| | | | | | | | LOCATION 1014 MONROE TURNPIKE, MONROE, CT. | | |
| | AUGER | CASING | SAMPLER | CORE BAR. | OFFSET | SURFACE ELEV. | HOLE NO. B-2 | | |
| TYPE | HSA | | SS | | LINE & STA. | GROUND WATER OBSERVATIONS | | START DATE | |
| SIZE I.D. | 3.75" | | 1.375" | | N. COORDINATE | AT 18.0 FT. AFTER 0 HOURS | | 10/12/15 | |
| HAMMER WT. | | | 140 lbs | | E. COORDINATE | AT FT. AFTER HOURS | | FINISH DATE | |
| HAMMER FALL | | | 30" | | | | | 10/12/15 | |
| DEPTH | SAMPLE | | | A | STRATUM DESCRIPTION + REMARKS | ELEV. | | | |
| | NO. | BLOWS/6" | DEPTH | | | | | | |
| 0 | 1 | 4-4-8-7 | 0.00'-2.00' | | TOPSOIL BR. FINE-MED. SAND, LITTLE SILT | 0.56 | | | |
| | 2 | 6-8-10-8 | 2.00'-4.00' | | | | | | |
| 5 | 3 | 6-7-10-11 | 4.00'-6.00' | | | | | | |
| | | | | | | | | | |
| 10 | 4 | 14-26-28 | 10.00'-11.50' | | GREY/BR. FINE-CRS. SAND, LITTLE SILT & GRAVEL, FEW COBBLES | 10.0 | | | |
| | | | | | | | | | |
| 15 | 5 | 14-24-60 | 15.00'-16.50' | | | | | | |
| | | | | | | | | | |
| 20 | 6 | 24-25-55 | 20.00'-21.50' | | BOTTOM OF BORING @ 21.5' | 21.5 | | | |
| | | | | | | | | | |
| 25 | | | | | | | | | |
| | | | | | | | | | |
| 30 | | | | | | | | | |
| | | | | | | | | | |
| 35 | | | | | | | | | |
| LEGEND: COL. A: SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50% | | | | | | DRILLER: T. CZMYR INSPECTOR: | | | |
| | | | | | | SHEET 1 OF 1 | HOLE NO. B-2 | | |

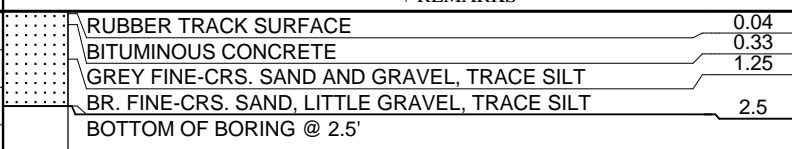
| CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033 | | | | CLIENT MILONE & MACBROOM, INC. | | | PROJECT NAME MASUK HIGH SCHOOL | | |
|--|--------|-------------|---------------|--|---|---------------------------------|---|---------------------|--|
| | | | | | | | LOCATION 1014 MONROE TURNPIKE, MONROE, CT. | | |
| | AUGER | CASING | SAMPLER | CORE BAR. | OFFSET | SURFACE ELEV. | | HOLE NO. B-3 | |
| TYPE | HSA | | SS | | LINE & STA. | GROUND WATER OBSERVATIONS | | START DATE 10/12/15 | |
| SIZE I.D. | 3.75" | | 1.375" | | N. COORDINATE | AT 20.0 FT. AFTER 0 HOURS | | | |
| HAMMER WT. | | | 140 lbs | | E. COORDINATE | AT FT. AFTER HOURS | FINISH DATE 10/12/15 | | |
| HAMMER FALL | | | 30" | | | | | | |
| DEPTH | SAMPLE | | | A | STRATUM DESCRIPTION + REMARKS | ELEV. | | | |
| | NO. | BLOWS/6" | DEPTH | | | | | | |
| 0 | 1 | 6-7-5-5 | 0.00'-2.00' | | TOPSOIL | 0.50 | BR. FINE-CRS. SAND, SOME SILT, LITTLE GRAVEL, TRACE ASPHALT, WOOD & CONCRETE - FILL | | |
| | 2 | 2-3-20-15 | 2.00'-4.00' | | | | | | |
| 5 | 3 | 12-14-10-14 | 4.00'-6.00' | | | | | | |
| | 4 | 9-7-4-4 | 6.00'-8.00' | | DARK BR. FINE-MED. SAND AND SILT, TRACE WOOD & ROOTS - FILL | 6.0 | | | |
| | 5 | 2-2-3-6 | 8.00'-10.00' | | | | | | |
| 10 | 6 | 2-12-17-22 | 10.00'-12.00' | | BR. FINE-CRS. SAND, LITTLE GRAVEL, TRACE SILT, FEW COBBLES | 11.5 | | | |
| | | | | | | | | | |
| 15 | 7 | 4-9-13 | 15.00'-16.50' | | BR. FINE-MED. SAND, LITTLE SILT | 15.0 | | | |
| | | | | | | | | | |
| 20 | 8 | 9-10-16 | 20.00'-21.50' | | BOTTOM OF BORING @ 21.5' | 21.5 | | | |
| | | | | | | | | | |
| 25 | | | | | | | | | |
| | | | | | | | | | |
| 30 | | | | | | | | | |
| | | | | | | | | | |
| 35 | | | | | | | | | |
| LEGEND: COL. A: SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50% | | | | | | DRILLER: T. CZMYR INSPECTOR: | | | |
| | | | | | | SHEET 1 OF 1 | | HOLE NO. B-3 | |


| CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033 | | | | CLIENT MILONE & MACBROOM, INC. | | | PROJECT NAME MASUK HIGH SCHOOL | | |
|--|--------|-------------|-------------|--|--|---------------------------------|---|----------------------|--|
| | | | | | | | LOCATION 1014 MONROE TURNPIKE, MONROE, CT. | | |
| | AUGER | CASING | SAMPLER | CORE BAR. | OFFSET | SURFACE ELEV. | | HOLE NO. B-4 | |
| TYPE | HSA | | SS | | LINE & STA. | GROUND WATER OBSERVATIONS | | START DATE 10/12/15 | |
| SIZE I.D. | 3.75" | | 1.375" | | N. COORDINATE | AT none FT. AFTER 0 HOURS | | | |
| HAMMER WT. | | | 140 lbs | | E. COORDINATE | AT FT. AFTER HOURS | | FINISH DATE 10/12/15 | |
| HAMMER FALL | | | 30" | | | | | | |
| DEPTH | SAMPLE | | | A | STRATUM DESCRIPTION + REMARKS | | | ELEV. | |
| | NO. | BLOWS/6" | DEPTH | | | | | | |
| 0 | 1 | 10-20-15-17 | 0.50'-2.50' | |  | | | | |
| 5 | | | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| LEGEND: COL. A: SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50% | | | | | | DRILLER: T. CZMYR INSPECTOR: | | | |
| | | | | | | SHEET 1 OF 1 | | HOLE NO. B-4 | |

| CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033 | | | | CLIENT MILONE & MACBROOM, INC. | | | PROJECT NAME MASUK HIGH SCHOOL | | |
|---|--------|-------------|-------------|--|--|---------------------------|---|----------------------|--|
| | | | | | | | LOCATION 1014 MONROE TURNPIKE, MONROE, CT. | | |
| | AUGER | CASING | SAMPLER | CORE BAR. | OFFSET | SURFACE ELEV. | | HOLE NO. B-5 | |
| TYPE | HSA | | SS | | LINE & STA. | GROUND WATER OBSERVATIONS | | START DATE 10/12/15 | |
| SIZE I.D. | 3.75" | | 1.375" | | N. COORDINATE | AT none FT. AFTER 0 HOURS | | | |
| HAMMER WT. | | | 140 lbs | | E. COORDINATE | AT FT. AFTER HOURS | | FINISH DATE 10/12/15 | |
| HAMMER FALL | | | 30" | | | | | | |
| DEPTH | SAMPLE | | | A | STRATUM DESCRIPTION + REMARKS | | | ELEV. | |
| | NO. | BLOWS/6" | DEPTH | | | | | | |
| 0 | 1 | 13-17-19-22 | 0.50'-2.50' | | RUBBER TRACK SURFACE 0.04 BITUMINOUS CONCRETE 0.33 GREY FINE-CRS. SAND AND GRAVEL, TRACE SILT 1.25 BR. FINE-CRS. SAND, TRACE SILT & GRAVEL 2.5 BOTTOM OF BORING @ 2.5' | | | | |
| 5 | | | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

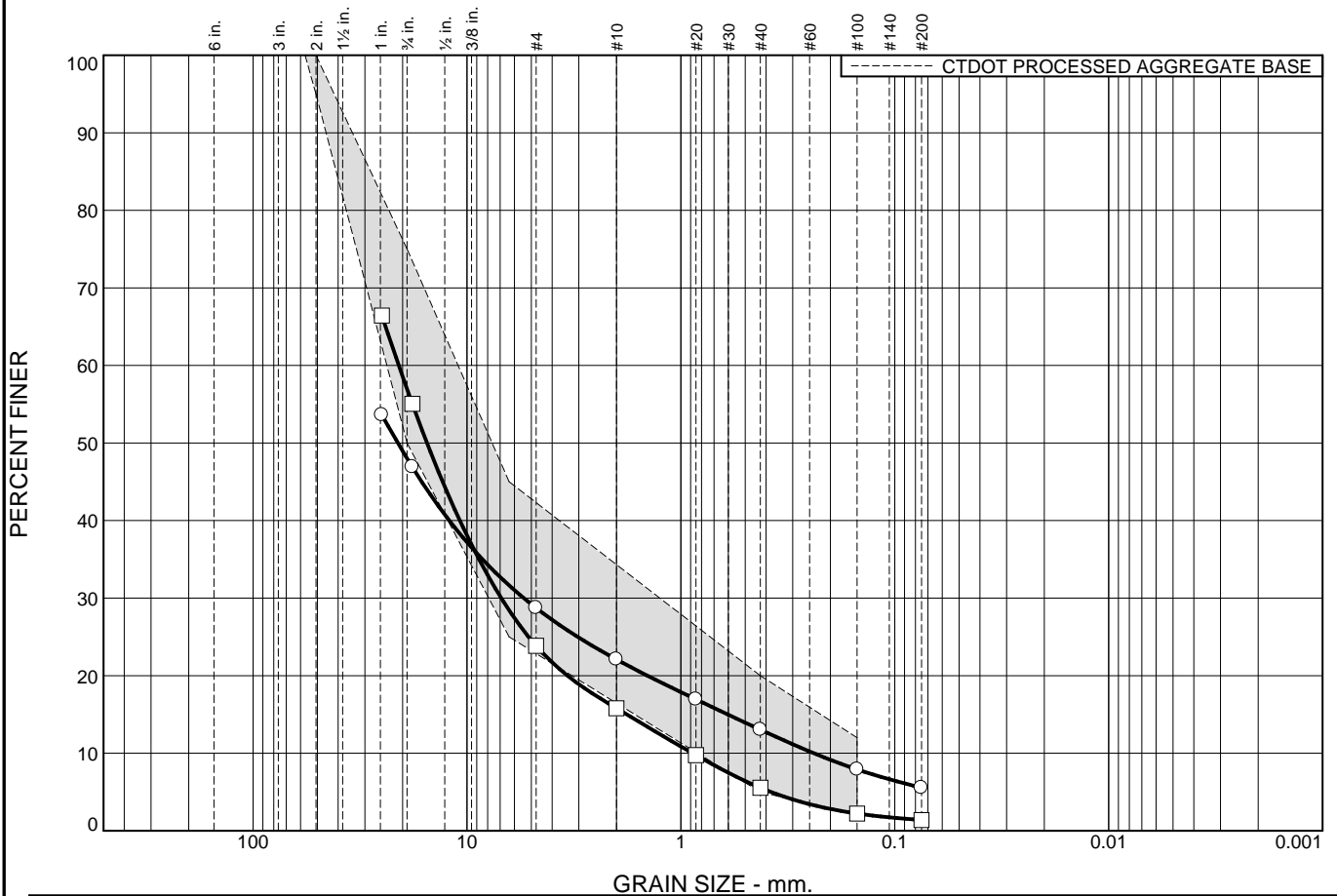
LEGEND: COL. A:
SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

| | |
|---------------------------------|---------------------|
| DRILLER: T. CZMYR INSPECTOR: | |
| SHEET 1 OF 1 | HOLE NO. B-5 |

| CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033 | | | | CLIENT MILONE & MACBROOM, INC. | | PROJECT NAME MASUK HIGH SCHOOL | |
|--|--------|-------------|-------------|--|--|--|---------------------|
| | | | | | | LOCATION 1014 MONROE TURNPIKE, MONROE, CT. | |
| | AUGER | CASING | SAMPLER | CORE BAR. | OFFSET | SURFACE ELEV. | HOLE NO. B-6 |
| TYPE | HSA | | SS | | LINE & STA. | GROUND WATER OBSERVATIONS AT none FT. AFTER 0 HOURS | |
| SIZE I.D. | 3.75" | | 1.375" | | N. COORDINATE | START DATE 10/12/15 | |
| HAMMER WT. | | | 140 lbs | | E. COORDINATE | AT FT. AFTER HOURS FINISH DATE 10/12/15 | |
| HAMMER FALL | | | 30" | | | | |
| DEPTH | SAMPLE | | | A | STRATUM DESCRIPTION + REMARKS | ELEV. | |
| | NO. | BLOWS/6" | DEPTH | | | | |
| 0 | 1 | 11-13-13-16 | 0.50'-2.50' | |  | | |
| 5 | | | | | | | |
| 10 | | | | | | | |
| 15 | | | | | | | |
| 20 | | | | | | | |
| 25 | | | | | | | |
| 30 | | | | | | | |
| 35 | | | | | | | |
| LEGEND: COL. A: SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50% | | | | | | DRILLER: T. CZMYR INSPECTOR: | |
| | | | | | | SHEET 1 OF 1 HOLE NO. B-6 | |

| CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033 | | | | CLIENT MILONE & MACBROOM, INC. | | | PROJECT NAME MASUK HIGH SCHOOL | | |
|--|--------|-------------|-------------|---------------------------------------|--|---------------------------------|---|----------------------|--|
| | | | | | | | LOCATION 1014 MONROE TURNPIKE, MONROE. CT. | | |
| | AUGER | CASING | SAMPLER | CORE BAR. | OFFSET | SURFACE ELEV. | | HOLE NO. B-7 | |
| TYPE | HSA | | SS | | LINE & STA. | GROUND WATER OBSERVATIONS | | START DATE 10/12/15 | |
| SIZE I.D. | 3.75" | | 1.375" | | N. COORDINATE | AT none FT. AFTER 0 HOURS | | | |
| HAMMER WT. | | | 140 lbs | | E. COORDINATE | AT FT. AFTER HOURS | | FINISH DATE 10/12/15 | |
| HAMMER FALL | | | 30" | | | | | | |
| DEPTH | SAMPLE | | | A | STRATUM DESCRIPTION + REMARKS | | | ELEV. | |
| | NO. | BLOWS/6" | DEPTH | | | | | | |
| 0 | 1 | 20-45-16-18 | 0.50'-2.50' | |  RUBBER TRACK SURFACE 0.04 BITUMINOUS CONCRETE 0.33 GREY FINE-CRS.SAND AND GRAVEL, TRACE SILT, CONCRETE, BRICK, ASPHALT & PLASTIC - FILL 1.17 BR. FINE-MED. SAND, TRACE TO LITTLE SILT 2.5 BOTTOM OF BORING @ 2.5' | | | | |
| 5 | | | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| LEGEND: COL. A: SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50% | | | | | | DRILLER: T. CZMYR INSPECTOR: | | | |
| | | | | | | SHEET 1 OF 1 | | HOLE NO. B-7 | |

Particle Size Distribution Report

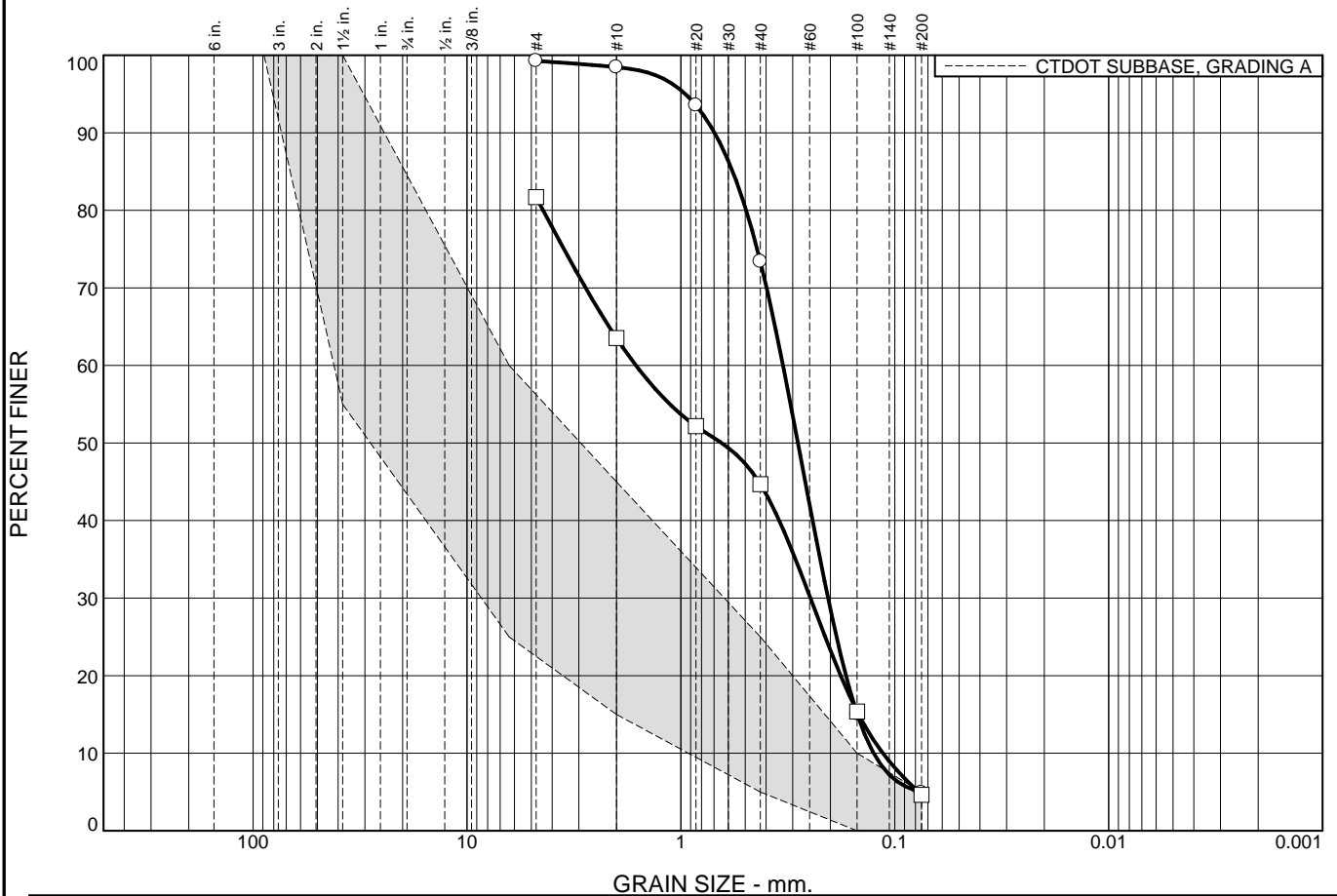


| | % +3" | % Gravel | | % Sand | | | % Fines | | | |
|---|-------|----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay | | |
| ○ | | | 19.3 | 6.6 | 9.1 | 7.5 | 5.5 | | | |
| □ | | | 33.1 | 8.0 | 10.3 | 4.1 | 1.4 | | | |
| × | LL | PL | D ₈₅ | D ₆₀ | D ₅₀ | D ₃₀ | D ₁₅ | D ₁₀ | C _c | C _u |
| ○ | | | | | 21.0191 | 5.4218 | 0.6038 | 0.2389 | | |
| □ | | | | 20.8232 | 15.3723 | 6.9135 | 1.7896 | 0.8816 | 2.60 | 23.62 |

| | Material Description | USCS | AASHTO |
|---|----------------------|------|--------|
| ○ | | | |
| □ | | | |

| | | |
|--|--|-----------------|
| Project No. Project: MASUK HIGH SCHOOL | Client: MILONE & MAcBROOM, INC. | Remarks: |
| ○ Source of Sample: B-4 Depth: 0.33 □ Source of Sample: B-7 Depth: 0.33 | | |
| CLARENCE WELTI ASSOCIATES, INC. | | Figure |

Particle Size Distribution Report



| | % +3" | % Gravel | | % Sand | | | % Fines | | | |
|---|-------|----------|--------|--------|--------|--------|---------|--------|------|-------|
| | | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay | | |
| ○ | | | | 0.8 | 25.1 | 68.5 | 4.9 | | | |
| □ | | | | 18.2 | 18.8 | 40.1 | 4.6 | | | |
| × | LL | PL | D85 | D60 | D50 | D30 | D15 | D10 | Cc | Cu |
| ○ | | | 0.5727 | 0.3332 | 0.2837 | 0.2050 | 0.1497 | 0.1255 | 1.01 | 2.65 |
| □ | | | | 1.6205 | 0.6456 | 0.2479 | 0.1476 | 0.1136 | 0.33 | 14.26 |

| Material Description | USCS | AASHTO |
|----------------------|------|--------|
| ○ | | |
| □ | | |

Project No. _____ **Client:** MILONE & MACBROOM, INC.
Project: MASUK HIGH SCHOOL

○ **Source of Sample:** B-5 **Depth:** 1.25
 □ **Source of Sample:** B-6 **Depth:** 1.25

Remarks:

Figure _____

CLARENCE WELTI ASSOCIATES, INC.

PROJECT: Masuk High School Track and Field
 Date: 10/12/2015

MMI #: 5660-02

| TEST PIT | LOT | DEPTH (in) | RESTRICTIVE LAYER (in) | | | | PERCOLATION | | |
|----------|-----|------------|------------------------|------------------|------------------|------------------|-------------|-----------------|------------|
| | | | MOTTILING | WATER | HARDPAN | LEDGE | ROOTS (in) | RATE (min/inch) | DEPTH (in) |
| 1 | | 0 | None Observed | None Observed | 14" | None Observed | N/A | - | - |
| 2 | | 0 | None Observed | None Observed | None Observed | None Observed | N/A | - | - |
| 3 | | 0 | None Observed | None Observed | None Observed | None Observed | N/A | - | - |
| 4 | | 0 | None Observed | None Observed | None Observed | None Observed | N/A | - | - |
| 5 | | 36 | None Observed | None Observed | None Observed | None Observed | N/A | - | - |

TEST PIT # 1

PROJECT: Masuk High School Track and Field
DATE: 10/12/2015
INSPECTOR: HAR
ELEVATION: --

MMI #: 5660-02
WEATHER: N/A

SOIL STRATUM ENCOUNTERED

| From | To | Description of Soils |
|------|----|-----------------------|
| 0 | 14 | Topsoil |
| 14 | 15 | Hardpan |
| 15 | 34 | Tan Fine Sand w/ Silt |
| | | |
| | | |

Mottling None Observed
Water None Observed
Ledge None Observed
Hardpan 14"
Roots N/A

Monitoring Well Installed: No
Perc Rate: -

COMMENTS: N/A

TEST PIT # 2

PROJECT: Masuk High School Track and Field
DATE: 10/12/2015
INSPECTOR: HAR
ELEVATION: --

MMI #: 5660-02
WEATHER: N/A

SOIL STRATUM ENCOUNTERED

| From | To | Description of Soils |
|------|----|----------------------|
| 0 | 16 | Topsoil |
| 16 | 38 | Tan Fine Sand |
| | | |
| | | |
| | | |

Mottling None Observed
Water None Observed
Ledge None Observed
Hardpan None Observed
Roots N/A

Monitoring Well Installed: No
Perc Rate: - -

COMMENTS: N/A

TEST PIT # 3

PROJECT: Masuk High School Track and Field
DATE: 10/12/2015
INSPECTOR: HAR
ELEVATION: --

MMI #: 5660-02
WEATHER: N/A

SOIL STRATUM ENCOUNTERED

| From | To | Description of Soils |
|------|----|----------------------|
| 0 | 12 | Topsoil |
| 12 | 33 | Tan Sand |
| | | |
| | | |
| | | |

Mottling None Observed
Water None Observed
Ledge None Observed
Hardpan None Observed
Roots N/A

Monitoring Well Installed: No
Perc Rate: -

COMMENTS: N/A

TEST PIT # 4

PROJECT: Masuk High School Track and Field
DATE: 10/12/2015
INSPECTOR: HAR
ELEVATION: --

MMI #: 5660-02
WEATHER: N/A

SOIL STRATUM ENCOUNTERED

| From | To | Description of Soils |
|------|----|----------------------|
| 0 | 4 | Topsoil |
| 4 | 43 | Tan Sand |
| | | |
| | | |
| | | |

Mottling None Observed
Water None Observed
Ledge None Observed
Hardpan None Observed
Roots N/A

Monitoring Well Installed: No
Perc Rate: -

COMMENTS: N/A

TEST PIT # 5

PROJECT: Masuk High School Track and Field
DATE: 10/12/2015
INSPECTOR: HAR
ELEVATION: --

MMI #: 5660-02
WEATHER: N/A

SOIL STRATUM ENCOUNTERED

| From | To | Description of Soils |
|------|----|----------------------|
| 0 | 6 | Topsoil |
| 6 | 36 | Tan sand |
| | | |
| | | |
| | | |

Mottling None Observed
Water None Observed
Ledge None Observed
Hardpan None Observed
Roots N/A

Monitoring Well Installed: No
Perc Rate: - -

COMMENTS: Loose sand and gravel starting @ 22" east end, disturbed to west end

SECTION X

Synthetic In-Filled Athletic Turf RFP

REQUEST FOR PROPOSAL - #2016-3

**SYNTHETIC IN-FILLED ATHLETIC TURF
AT
MASUK HIGH SCHOOL
MONROE, CONNECTICUT**

April 19, 2016

MMI #5660-02

Prepared for:

Monroe Board of Education
Monroe, Connecticut

Prepared by:

MILONE & MACBROOM, INC.
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773
www.miloneandmacbroom.com

TABLE OF CONTENTS

| | <u>Page</u> |
|--|--------------|
| PROPOSAL REQUIREMENTS | PR-1 – PR-6 |
| TECHNICAL SPECIFICATIONS | TS-1 – TS-16 |
| GENERAL INFORMATION SPECIFICATIONS | |
| Proposal Form | PF-1 – PF-3 |
| PREVAILING WAGES | |
| Wage Rates and Classifications | |
| Prevailing Wage Rates Bid Package | |
| APPENDIX | |
| Drawing 1 of 4 – Synthetic Turf Field – Layout Plan | |
| Drawing 2 of 4 – Synthetic Turf Field – Site Details | |
| Drawing 3 of 4 – Synthetic Turf Field – Site Details | |
| Drawing 4 of 4 – Synthetic Turf Field – Site Details | |

PROPOSAL REQUIREMENTS

MONROE BOARD OF EDUCATION

REQUEST FOR PROPOSALS #2016-3

SYNTHETIC IN-FILLED ATHLETIC TURF

MASUK HIGH SCHOOL
MONROE, CONNECTICUT

General

The Monroe Board of Education is seeking proposals from synthetic turf manufacturers to supply and install the synthetic turf, organic infill, and resilient polypropylene shock/drainage pad at Benedict Stadium at Masuk High School, located at 1014 Monroe Turnpike in the Town of Monroe, CT.

Process

Upon receipt of the responses to this solicitation, the Town of Monroe may, but shall not be required to, invite one or more synthetic turf manufacturers responding to this solicitation to present their qualifications to the Building Committee. The final selection will be based on both the qualifications of the manufacturer and the cost of the product that best meets the needs of the Board and Town of Monroe. The Board and Town will award the contract to the respondent offering the most advantageous proposal while taking into consideration all evaluation criteria set forth in the RFP (as well as price). Finally, the Committee, Board of Education or the Town of Monroe reserves the right to reject any or all proposals or to waive any informalities in the proposal process if it is in the best interest of the Town to do so. The successful company's name and cost will then be included in the final plans and specifications for the construction of the project, which is expected to be solicited for bid and constructed during the present construction season. **Note that the successful turf manufacturer will be a subcontractor to the prime contractor.** It is anticipated that a tentative notice of award will be made to the successful bidder subject to the project moving forward.

Project Description

The existing track and field facility will be reconstructed at Masuk High School. The existing grass athletic field within the running track will be replaced with a synthetic athletic turf having an organic infill to be used for a variety of sports including football, soccer, lacrosse, and field hockey. The existing base and subsurface drainage system will be replaced. A track edge drain will be installed along the inside perimeter of the track. A flush concrete curb will be installed along the edge of the northern and southern D-zones of the field. Both the edge drain and the curb will serve as the anchor for the synthetic turf fabric. The synthetic turf will be installed over the top of a resilient polypropylene shock/drainage pad.

The Town of Monroe, through this Request for Proposal (RFP), will select one synthetic turf manufacturer to supply and install a synthetic turf product and resilient polypropylene shock/drainage pad at the cost established by this RFP, which cost shall remain in effect for 120 days. The selected turf

product and resilient polypropylene shock/drainage pad will be specified in the Construction Documents as the only source for said products. The synthetic turf manufacturer will furnish and install the turf and pad as a subcontractor to the site contractor having the lowest qualified bid. The successful synthetic turf manufacturer shall also be required to attend a pre-bid meeting to answer any questions of prospective bidders for the site work and to coordinate with the site contractor during the preparation of the subbase for the resilient polypropylene shock/drainage pad and synthetic field surface. The cost of attendance at the pre-bid meeting and coordination with the site contractor will be included in the cost presented in this solicitation.

Submittals

Synthetic turf manufacturing firms wishing to be considered shall submit five (5) copies of their concisely worded submittal package, consisting of (1) a letter of interest, together with general information on the company and proposed subcontractors; (2) experience of the company; (3) a list of successfully completed fields that demonstrates compliance with the Technical Specifications. The list of successfully completed fields shall clearly identify the product installed, including any model, style, pile height, pile weight, and/or other distinguishing characteristics; (4) one box sample of the manufacturer's synthetic turf and infill to be installed that meets or exceeds the attached specification requirements; (5) one 12"x12" minimum rag sample (no infill) of the manufacturer's synthetic turf and shock/drainage pad to be installed that meets or exceeds the attached specification requirements; (6) one 12"x12" sample of the resilient polypropylene shock/drainage pad with manufacturer's literature demonstrating compliance with the technical specifications. Only one sample (not five) of the product samples should be submitted; and (7) a draft copy of the full warranty policy and forms for the synthetic turf, organic infill and resilient polypropylene shock/drainage pad.

The Proposal Form included at the end of this RFP shall be submitted in a clearly marked separate envelope. Pricing shall be for the same model, style, quality, etc. as the sample of synthetic turf, organic infill and shock/drainage pad submitted. If more than one sample is provided, pricing for each sample shall be submitted on separate Proposal Forms that clearly identify which sample and product model is being priced.

Submittals shall be based on the format and requirements set forth in this RFP. These shall be addressed to:

Gabriella DiBlasi
Director of Finance and Management Services
Monroe Public Schools
375 Monroe Turnpike
Monroe, CT 06468

Submittals shall be accepted until 10:00 a.m. on May 4, 2016. All submittals shall be clearly labeled "RFP, Synthetic In-Filled Athletic Turf."

Contact

Respondents with questions regarding the submission requirements may contact Ms. Gabriella DiBlasi, Director of Finance and Management Services, Monroe Public Schools, email gdblasi@monroeps.org. All questions shall be presented at least 72 hours prior to the response deadline to allow for sufficient time to draft and post addenda, if required.

Indemnification

To the fullest extent permitted by law, the successful respondent, its subcontractor, agents, servants, officers or employees shall indemnify and hold harmless the Board of Education and the Town of Monroe, Connecticut, including, but not limited to, its respective elected and appointed officials, officers, employees and agents, from any and all claims brought by any person or entity whatsoever, arising from any act, error, or omission of the provider during the respondent's performance of the Agreement or any other agreements of the respondent entered into by reason thereof. The respondent shall indemnify and defend the Board of Education and the Town of Monroe, Connecticut, including, but not limited to, its respective elected and appointed officials, officers, employees and agents, with respect to any claim arising, or alleged to have arisen from negligence, and/or willful, wanton or reckless acts or omissions of the respondent, its subcontractor, agents, servants, officers, or employees and any and all losses or liabilities resulting from any such claims, including, but not limited to, damage awards, costs and reasonable attorney's fees. This indemnification shall not be affected by any other portions of the Agreement relating to insurance requirements. The respondent agrees that it will procure and keep in force at all times at its own expense, insurance in accordance with these specifications.

Equal Opportunity – Affirmative Action

The successful respondent shall comply in all aspects with the Equal Employment Opportunity Act.

Freedom of Information

All proposal submissions and materials become property of the Board and will not be returned. Respondents to this RFP are hereby notified that all proposals submitted and information contained therein and attached thereto shall be subject to disclosure under the Freedom of Information Act.

Termination

Following implementation, should the Board find that the firm has failed in any material respect to perform its agreed upon obligations under the contract, the contract shall be canceled by the Board of Education as being in the best interest of the Board. In the event of termination of this contract as a result of breach by the contractor, the Board and the Town shall not be liable for any fees and may, at its sole option, award a contract for the same services to another qualified firm or call for new proposals. The contractor shall be responsible for consequential damages as a result of its breach, including, but not limited to, extra costs required under the new contract for similar services.

Acceptance or Rejection

The Board reserves the right to accept or reject any and all proposals and to waive any minor deviations from our proposal requirements if it is in the best interest of the Town to do so.

Insurance Requirements

The Contractor, at their expense, will provide, carry and maintain throughout the term of this contract, adequate insurance as requested by the Board that will protect the Contractor, the Board of Education and the Town of Monroe, its officers, employees and volunteers from any and all claims for loss, damage, injury or death which may arise from the operation of this contract by the Contractor or anyone directly or indirectly employed by them. Policies shall be so written that the Town of Monroe will be notified of cancellation at least thirty (30) days prior to the effective date of such cancellation. Certificates showing that all of the Contractor's operations are covered, and stating the coverage with the Town included as an additional insured, the limits of liability, expiration dates and exclusions, if any, will be filed with the Town of Monroe before the term of the contract commences.

The Contractor shall provide the Town with certification by a properly qualified representative of the insurer that the Contractor's insurance complies with this section.

All of the insurance policies required shall have the legal company name of the insurer providing coverage, and contain the current rating of the insurer as provided by "Best's Insurance Reports", which must be A-, VII or above. This obligation applies to coverage written on an occurrence as well as a "claims-made" basis.

The Insurance Certificate must state whether coverage is written on an "occurrence" basis or a "claims-made" basis. All insurance must maintain that the Town is an "additional insured" for General Liability and Umbrella policies, and any other coverage as the Town may require for specific projects. Such insurance must be issued by insurance companies licensed to write such insurance in the State of Connecticut.

The Town of Monroe, its officers, officials, employees and volunteers are to be covered as insured as respects liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied, or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Town, its officers, officials, employees, or volunteers.

The Contractor's insurance coverage shall be primary insurance as respects the Town, its officials, employees and volunteers. Any insurance or self-insurance maintained by the Town, its officers, officials, employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

Section A. Worker's Compensation and Employer's Liability

Worker's Compensation must be provided in accordance with the Worker's Compensation Laws of Connecticut. Should a Contractor be involved in operations requiring coverage under special State or

Federal Acts, such as Maritime or Railroad, the Contractor must provide evidence of this coverage. Should a Contractor be exempt from the Worker's Compensation Laws of the State of Connecticut, or any other State or Federal requirements, evidence of such exemption must be provided to the Town and a "Hold-Harmless" agreement provided in language satisfactory to the Town holding it harmless in the event of any claim for injury or damages. Contractors based out-of-state must provide evidence that their Worker's Compensation policy will cover injuries/illnesses sustained while working in the State of Connecticut.

The Contractor is responsible for ensuring that all of its subcontractors carry Worker's Compensation Insurance, as described above.

Employer's Liability must be provided in accordance with the following limits:

- \$500,000 each - Bodily Injury
- \$500,000 disease - Policy Limit - Bodily Injury
- \$500,000 disease - Each Employee - Bodily Injury
- Section B. General Liability

Occurrence Policy Guidelines

General Liability - Written under commercial or comprehensive form including the following:
(Premises/Operation, Products/Completed Operations, Contractual, Independent Contractors, Broad Form Property Damage, and Personal Injury)

- General Aggregate \$2,000,000
- Products/Completed Operations Aggregate \$2,000,000
- Personal & Adv Injury \$1,000,000
- Each Occurrence \$1,000,000
- Fire Damage (any one fire) \$1,000,000
- Medical Expense (any one person) \$10,000

Excess Liability (Umbrella)

- Each Occurrence \$1,000,000
- Aggregate \$1,000,000

The Town requires that these aggregate limits be maintained by the Contractor as required. It is the responsibility of the Contractor or his representative to notify the Town if ever or whenever claims reduce the General Aggregate below \$2,000,000. If the aggregate limits include defense costs the Town should be so notified. It is the responsibility of the Contractor and his insuring agent to provide the Town with current certificates throughout the contract period keeping the required limits in full force and effect. The Town of Monroe reserves the right to modify or change the requirements at any time if it is in the best interest of the Town to do so.

Claims-Made Coverage Guidelines

General Liability - Written under commercial or comprehensive form including the following:

- Premises/Operations
- Products/Completed Operations
- Contractual
- Independent Contractors
- Broad Form Property Damage and Personal Injury

The Town requires that the Certificate of Insurance include the retroactive date of the policy. Retroactive dates must be either before or coincident with the Contract's inception.

The Town requires prompt and immediate notice of the following:

- Erosion of any aggregate limits.
- Advance of any retroactive dates.
- Cancellation or non-renewal. Prior 30 day notice.

The Town requires that any extended reporting period premium be paid by the named insured. The reporting of possible claims to the Town of Monroe is necessary and the Town retains the right to require that the extended reporting period be invoked by the Contractor at his/her expense. The Town requires that if any excess coverage is secured to meet the requirements that the retroactive dates be concurrent with the primary policy and that the retro dates be either before or coincident with the inception of the Contract. If the retroactive date is moved, or if the policy is canceled or not renewed, the Contractor must invoke the tail coverage option, at no expense to the Town but rather at the expense of the Contractor, in order to adequately assure that the policy meets the above requirements.

Liability Limits: Same as those under "Occurrence Policy Guidelines".

Section C. Automobile Liability

Automobile Liability - coverage for commercial or comprehensive automobile liability (vehicular), covering any auto, all owned autos (private passenger), all owned autos (other than private passenger), hired autos and non-owned autos.

- Combined Single Limit – Bodily Injury/Prop Damage \$1,000,000

Insurance under B & C above must provide for a 30-day notice to the Town of Monroe of cancellation, non-renewal, termination, or any restrictive amendment.

TECHNICAL SPECIFICATIONS

SECTION 33 32 00 SYNTHETIC INFILLED ATHLETIC TURF SURFACE

PART 1 – GENERAL

1.1 SUMMARY

- A. Furnish all labor, materials, tools and equipment necessary to install a dual fiber (slit film, monofilament blend) artificial grass field turf as indicated on the plans and as specified herein. The installation of all new materials shall be performed in strict accordance with the Manufacturer's* installation instructions and in accordance with the Contract Documents. The work will include, without limitation, the survey layout for the placement of the synthetic turf fabric; the placement of the fabric and the sewing of seams; fastening the fabric to the concrete edge (provided by the General Contractor); installing lines and marks for each sport; installing the organic infill; final grooming; and training of school personnel on maintenance procedures.

- B. Provide written acceptance from the turf manufacturer of the perimeter edge detail meets the requirements for the installation of the synthetic turf. It is the responsibility of the Contractor to repair any deficiencies in the dynamic stone base.

- C. Provide written acceptance from the turf manufacturer that the perimeter edge detail meets the requirements for the installation of the synthetic turf. It is the responsibility of the Contractor to install the perimeter edge details required for the system in strict accordance with the Manufacturer's requirements and as approved by the Owner.

*For the purpose of this specification, the term Turf Manufacturer may be interpreted as meaning Turf Vendor since it is understood that some, but not all, suppliers of synthetic turf purchase the carpet (fabric) from an independent carpet mill.

1.2 RELATED SECTIONS

- A. Section 334623 – Athletic Field Subsurface Drainage System

1.3 REFERENCES

- A. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition

- B. ASTM Standard Test Methods:
 - D1577 - Standard Test Method for Linear Density of Textile Fiber
 - D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
 - D418 - Standard Test Method for Testing Pile Yarn Floor Covering Construction
 - D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
 - D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics

- D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)
- F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
- D4491 - Standard Test Methods for Water Permeability of Geotextile by Permittivity
- D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
- F355 - Standard Test Method for Shock-Absorbing Properties of Playing Surfaces.
- F1936 - Standard Test Method for Shock-Absorbing Properties of North American Football Field Playing Systems as Measured in the Field
- D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

- C. Current NFHS and CIAC Rules and Interpretations
- D. Current "Suggested Guidelines for the Essential Elements of Synthetic Turf Systems" of the Synthetic Turf Council (STC).

1.4 SUBMITTALS

- A. Prior to the Engineer/Landscape Architect's approval of a specified artificial turf system, the Turf Manufacturer/Vendor shall provide a notarized Affidavit that its turf system does not violate any other manufacturer's patents, patents allowed, or patents pending.
- B. Prior to the Engineer/Landscape Architect's approval of the specified turf system, the Turf Manufacturer/Vendor shall provide a notarized Affidavit that its turf system, including the fiber, and infill after installation will meet or exceed the requirements related to discharges into surface or ground water and emissions in effect at the time of installation established by the U.S. Environmental Protection Agency, the State of Connecticut Departments of Energy and Environmental Protection and Public Health, and any other agency of competent jurisdiction.
- C. **Submit the following with the Proposal:**
 1. One rag sample, 12x12 inch in size, illustrating details of finished product.
 2. One boxed sample including infill representative of the finished synthetic turf system.
 3. A bagged sample of the organic infill.
 4. A letter and specification sheet certifying that the products of this section meet or exceed specified requirements.
 5. Certified copies of independent (third-party) laboratory reports on ASTM tests specified in Section 2.1.B below.
 6. List of existing recent installations using dual fiber with a traditional and alternative infill system in the United States, including Owner representative and telephone number.

7. The Turf Manufacturer/Vendor shall provide a sample copy of insured, non-prorated warranty and insurance policy information.
- D. Prior to ordering of materials:
1. The Turf Manufacturer/Vendor shall submit through the General Site Contractor Shop Drawings indicating:
 - a. Field Layout, as directed by the Owner and indicated on the contract drawings.
 - b. Field Marking Plan and details for the specified sports meeting the requirements of NFHS and CIAC.
 - c. Roll/Seaming Layout.
 - d. Methods of attachment, field openings, and perimeter conditions.
 - e. Dimensions and colors for the centerfield logo.
 2. The Turf Manufacturer/Vendor shall submit:
 - a. The fiber manufacturer's name, type of fiber, and composition of the fiber
 - b. Infill manufacturer's name, composition of material, and MSDS and other related environmental test data.
 - c. Rag samples for colors to be used in the field event line stripping and centerfield logo.
- E. Prior to Final Acceptance, the Contractor shall submit to the Owner:
1. Five (5) printed copies and one (1) electronic copy (pdf) of Maintenance Manuals, which will include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.
 2. The testing data and certification from an approved independent testing laboratory that the finished field meets and/or exceeds the required impact attenuation G-max, as per ASTM F1936 and these specifications.
 3. Project Record Documents: Record actual locations of seams, drains, or other pertinent information.
 4. Warranty: Submit Manufacturer Warranty for synthetic turf and organic infill and ensure that forms have been completed in Owner's name and registered with Manufacturer.
 5. **Attic Stock:** Provide an additional 15 feet by 20 feet of green turf. Provided one sack (minimum one ton) of surplus organic infill material separated into manageable plastic containers for storage at a location specified by the Owner. Plastic containers shall be Rubbermaid BRUTE Rollout Container(s), maximum 65 gallon size, constructed from HDPE, with heavy duty wheel and attached lid, or approved equal.

1.5 QUALITY ASSURANCE

- A. Manufacturer/Vendor Qualifications: Company whose primary business specializes in manufacturing and installing synthetic infill athletic turf products specified in this section. The turf manufacturer/vendor and its installation personnel:
1. Must be experienced in the manufacture and self-installation or by licensee of this specific type of dual fiber grass system for at least five years in the United States and Europe.

2. Must have experience with NCAA, FIFA or NFHS baseball, football, soccer, lacrosse or field hockey fields installed with the product specified in these Contract Documents.
 3. Must have fields of 75,000 sq. ft. or more of the specified turf material in play for at least three years.
- B. Installer Qualifications: Company specializing in performing the work of this section.
1. The manufacturer must provide competent workmen skilled in this specific type of synthetic turf installation. Such employees shall be directly employed by the turf manufacturer/vendor or by a licensee of the Manufacturer installing the Manufacturer's products as the principal turf product. Independent subcontractors shall not be permitted. Evidence of such employment shall be submitted to the Owner prior to the installation of the turf.
 2. The designated supervisory personnel on the project must have five years of experience and be certified, in writing by the Turf Manufacturer/Vendor, as competent in the installation of this dual fiber material, including sewing seams and proper installation of the infill mixture.

1.6 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to project site in wrapped condition.
- B. Store products under cover and elevated above grade.

1.8 WARRANTIES

- A. The Turf Manufacturer/Vendor shall provide a warranty to the Owner that covers defects in materials, installation, workmanship of the turf, and the organic infill for a period of eight years from the date of Substantial Completion. The Turf Manufacturer/Vendor shall verify in writing to the Owner that their on-site representative has inspected the installation and that the work conforms to the Manufacturer's requirements. The artificial grass field turf must maintain an ASTM F355/ASTM F1936 measured G-max of between 85-120 for the life of the warranty.
- B. The Turf Manufacturer/Vendor's warranty shall include general wear and damage caused from UV degradation.
- C. The Turf Manufacturer/Vendor's warranty must be supported by a third party prepaid, non-cancelable insurance policy for the full eight (8) year period from an insurance company with an AM Best rating of A- or better, no maximum limit on a single claim, no deductible or retention amount per claim. The insurance policy shall be in favor of the Owner and shall be specific to the project site.

A draft copy of the full policy shall be submitted by each bidder with their bid and shall indicate that such coverage is now in effect or will be in effect at the time of the execution of the contract with the Owner. The synthetic Turf Manufacturer/Vendor shall also submit a signed affidavit affirming the warranty requirements of these specifications. The effective date of the policy shall begin at the time of substantial completion of the field and shall terminate eight (8) years thereafter.

1.9 MAINTENANCE SERVICE

- A. The Turf Manufacturer/Vendor will train the Owner's facility maintenance staff in the use of the Turf Manufacturer's/Vendor's recommended groomer and other appropriate maintenance practices. Up to eight hours of training are included in this specification.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. The component materials of the synthetic grass field turf system consist of:
 - 1. A carpet made of UV-resistant polyethylene slit-film and monofilament fibers tufted into a fibrous, either perforated or non-perforated, porous multi-layer backing.
 - 2. Glue, thread, paint, seaming fabric, and other materials used to install and mark the artificial grass slit-film turf.
- B. The installed artificial grass slit-film turf shall have the following properties:

| Standard | Property | Specification |
|------------------|-----------------------------|--------------------------------|
| ASTM D1577 | Fiber Denier – Silt Film | 8,000 nominal |
| | Fiber Denier - Monofilament | 10,000 nominal |
| ASTM D418/D5848 | Pile Height | 1.75" nominal |
| ASTM D418/D5848 | Pile Weight | 41 oz./sq. yd. |
| ASTM D1335 | Tuft Bind | 9 lbs. (without infill) |
| ASTM D1682/D5034 | Grab Tear (width) | >200 lbs/force |
| ASTM D1682/D5034 | Grab Tear (length) | >200 lbs/force |
| ASTM D5793 | Stitch Gauge | 3/8" |
| ASTM D4491 | Carpet Permeability | >40 inches/hour |
| ASTM F1936 | Impact Attenuation, Gmax | ≥85-100 (+/-10) @ installation |
| | | ≤120 over field life* |

*TURF SYSTEM will be installed over resilient polypropylene shock/drainage pad. See section 2.3 for requirements. However, the field shall be tested for Gmax one time upon completion of installation prior to acceptance per the requirements of this specification.

- C. The carpet shall consist of polyethylene slit film and monofilament fibers tufted into a

primary backing with a secondary backing.

1. The carpet shall be furnished in 15' wide rolls. Rolls shall be long enough to go from sideline to sideline without splicing.
 2. The carpet's primary backing shall be a double-layered polypropylene fabric treated with UV inhibitors. The secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 3. The fiber shall be low friction, UV-resistant fiber measuring 1.75 inches high nominal. Systems with less than a 1.75 inches (nominal) fiber will not be permitted.
- D. Thread for sewing seams of turf shall be as recommended by the synthetic Turf Manufacturer/Vendor.
- E. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic Turf Manufacturer/Vendor.

2.2 INFILL MATERIALS

- A. Organic Infill preapproved manufacturers include Geofill, Greenplay, or Geo Plus.
1. Organic infill: Infill system shall be comprised of a proven blend of coconut fiber matrix blended with cork, brown in color, 100% organic, not chemically treated & pesticide free.
 2. The organic infill must be mineral free to avoid abrasiveness and compaction.
 3. The bulk density of the organic infill must be less than 12 lbs. per cubic foot or 160 grams per cubic centimeter.
 4. No more than 43% of the organic infill comprised of coconut fiber and cork shall pass through the #18 (1mm) sieve.
 5. Durability and resistance to compaction:
 - a. Must be able to retain no more than a 10% variance in gradation or bulk density after a thousand repeated impacts of a 20-pound missile.
 6. Typical infill quantity varies with pile height and density:
 - a. 2 lbs. per square foot for a 2 ½ inch pile height.
 - b. 1 ¾ lbs. per square foot for a 2 inch pile height.
 - c. 1 ½ lbs. per square foot for a 1 ¾ inch pile height.
 7. Installation:
 - a. Prepare the turf by first installing a uniform ballast layer of rounded or sub-rounded 20/40 silica sand at 4 lbs. (min) per square foot.
 - b. Organic infill is to be installed in layers until reaching the desired infill depth based on the pile height as described above.
 - c. Upon completion of filling, the field must be watered down to allow for settling of the infill.
 - d. Allow the infill to dry and apply a final layer to top-off the installation, then wet the field once again before delivering to customer.
 - e. Upon completion, free pile height shall be no more than ¾ inch.
 8. End of Life Recyclability:

- a. The organic infill must be 100% organic and natural for utilization after removal from the turf as a top-dressing for natural grass or to be tilled into natural soil.
- b. The organic infill must be 100% organic and natural as to not contaminate the synthetic turf after its full life cycle with any inorganic components that would prevent it from re-purposing.

2.3 RESILIENT POLYPROPYLENE SHOCK PAD/DRAINAGE PAD

- A. Description: Resilient Polypropylene Base Material
 1. Vertical drainage – 50" per hour minimum (EN12616)
 2. Friction coefficient – movement of artificial turf over 50 mm distance 2.0 lbs maximum force ISO 8295
 3. Coefficient of linear thermal expansion < 0.15 mm /m /° C, ISO 4897. Thermal Resistance (R Value) minimum 3.0 per ASTM D3575
 4. Provide maximum average G-Max of field of 100 upon initial testin (ASTM F355; System test under infilled turf)
 5. Guarantee maximum average G-Max of field of 120 during warranty period of turf. (ASTM) F355; System test under infilled turf).
 6. Field must meet critical fall height minimum of 1.6 meters for the warranty period of the turf. Examples of a minimum of 5 fields in the USA at least 5 years old must be provided.
 7. Supplier must provide documentation that product meets human health screening levels and total threshold limit concentration using EPA Method 3052 and Title 22 (CAM 17) metals using EPA Method 6020/7471A and for hexavalent chromium using EPA Method 7196A.
 8. Product must be Cradle to Cradle Certified.
 9. Product must be made in the United States of America.
 10. Manufacturer must prove absence of heavy metals in production material, and controlled chain of custody for all materials used.
 11. Manufacturer: Brock International or pre-approved equal.
- B. Product Format
 1. Size: approximately 61.1 x 42.0 inches interlocking panels.
 2. Area: Net Coverage per panel 16.89 ft²
 3. Thickness: 0.90" (23 mm) +/- 0.18"
 4. Panel Weight: approximately 3.5 lbs / panel
- C. Product substitutions are allowed only in accordance with pre-bid substitution request procedures outlined in the contract documents. No substitutions will be allowed after the bid date. Bidding contractor must identify performance base system with bid package. If a non-specified product is identified, the proposed alternate product must be submitted and pre-approved by the Engineer/Landscape Architect 5 days prior to the bid opening. If bidding contractor does not identify a manufacturer, the Town will assume that the specified product is included in the bid package and will not consider substitutions. No product substitutions will be accepted after award.

2.4 FIELD GROOMER

- A. Supply a field groomer, which shall include a towing mechanism compatible with a field utility vehicle.
- B. The field groomer shall be a Greens Groomer Synthetic Turf Groomer, FieldTurf Groomright, Redexim Verti-Groom, SMG TurfCare TCA1400 or approved equal.

2.5 TURF SWEEPER

- A. Supply a field sweeper, 46" minimum width, suitable for removing leaves, loose paper and other debris, which shall include a towing mechanism compatible with a field utility vehicle.

PART 3 – EXECUTION

3.1 GENERAL

- A. The installation shall be performed in full compliance with the Contract Documents, approved Shop Drawings, and the instructions of the Manufacturer.
- B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, and topdressing or brushing operations.
- C. All designs, markings, layouts, and materials shall conform to all currently applicable NFHS and CIAC rules and/or any other rules or standards that may apply to this type of synthetic grass installation. All designs, markings, and layouts must first be approved by the Engineer or Owner in the form of approved shop drawings. All markings will be installed in full compliance with those drawings. Prior to the beginning of installation, the Turf Manufacturer/Vendor for the synthetic turf shall inspect and accept the sub-base for planarity. The Turf Manufacturer/ Vendor shall also accept in writing that the base is in compliance with the synthetic Turf Manufacturer's/Vendor's specifications for permeability, compaction, and gradation after the Owner provides him with all test results. The Turf Manufacturer/Vendor shall have the dimensions of the field and locations for markings measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.
- D. The Turf Manufacturer/Vendor shall provide the necessary testing data to the owner that the finished field exceeds the required shock attenuation as per ASTM F1936.

3.2 EXAMINATION

- A. Verify that all sub-base leveling is complete prior to installation.
- B. The surface to receive the synthetic turf shall be inspected by the Turf Manufacturer/Vendor and, prior to the beginning of installation, the Manufacturer must

accept the sub-base planarity in writing. The acceptance will be based on the Owner providing the Manufacturer with test results indicating that compaction and planarity are in compliance with the synthetic Turf Manufacturer's/Vendor's specifications. The surface must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.

- C. The compaction of the sub-base material shall be 95%, $\pm 1.5\%$ according to the Modified Proctor procedure (ASTM D1557), and the surface tolerance shall not exceed 0-1/4" over 10 feet and 0-1/2" from design grade.

3.3 INSTALLATION

- A. Install in accordance with Turf Manufacturer's/Vendor's instructions. The Turf Manufacturer/Vendor shall strictly adhere to the installation procedures outlined under this section. Any variance from these requirements must be accepted in writing by the Manufacturer's on-site representative and submitted to the Architect/Owner, verifying that the changes do not in any way affect the warranty. Infill materials shall be approved by the Manufacturer and installed in accordance with the Manufacturer's standard procedures.
- B. The carpet rolls are to be installed directly over the resilient polypropylene base material and fastened to the concrete curb or edge drain as shown on the plans. Extreme care should be taken to avoid disturbing the base, in regard to planarity.
- C. The full width rolls shall be laid out across the field. Turf shall be of sufficient length to permit full cross-field installation from sideline to sideline. No head or cross seams will be allowed in the main playing area between the sidelines. Utilizing standard state of the art sewing procedures, each roll shall be attached to the next. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing field turf.
- D. This is a 99% sewn installation. Gluing of rolls shall not be acceptable. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications. All seams shall be sewn using double bagger stitches and polyester thread or, in the case of inlays only, adhered using seaming tape and high grade adhesive (per the Manufacturer's standard procedures). Seams shall be flat, tight, and permanent with no separation or fraying.
- E. Infill materials shall be installed per Section 2.2 of the specifications. The infill material shall be installed to a depth indicated on the drawings.
- F. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The infill shall be placed to expose the fibers to the depth indicated on the Contract Drawings.

- G. Synthetic turf shall be attached to the perimeter edge detail in accordance with the Manufacturer's standard procedures.

3.4 FIELD MARKINGS

- A. All markings are to be installed in accordance with the Contract Drawings and approved shop drawings.
- B. **Bid Alternate No. A2 – Furnish and Install “H” Logo.** Install logo at the center of the field as detailed. Submit shop drawings and color samples for approval by owner.

3.5 CLEANING

- A. Protect installed field turf from subsequent construction operations.
- B. Do not permit traffic over unprotected field surface.
- C. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- D. All usable remnants of new material shall become the property of the Owner.
- E. The Contractor shall keep the area clean throughout the project and clear of debris.
- F. Surfaces, recesses, enclosures, etc. shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.6 ANNUAL INSPECTION, TESTING AND REPORTING BY TURF MANUFACTURER/ VENDOR

- A. On or before the annual anniversary date of acceptance of the synthetic turf by the Owner **for the term of the warranty**, the Turf Manufacturer/Vendor or its authorized representative, including any successor to the company, at no cost to the Owner shall inspect the field to identify deficiencies that may be apparent and that could have an effect on the terms and conditions of the warranty. The findings of such inspection shall be provided to the Owner within one week of such inspection. Any remedial actions that are deemed by the Owner to be the responsibility of the Turf Manufacturer/Vendor and not related to the Owner's maintenance practices shall be undertaken within 15 days of the submission of the inspection report to the Owner.

- B. In addition, on or before the annual anniversary date of acceptance of the synthetic turf by the Owner **for the term of the warranty (8 years)**, the Turf Manufacturer/Vendor or its authorized representative, including any successor to the company, at no cost to the Owner shall engage the services of an independent testing laboratory to test the impact attenuation G-max, per ASTM F1936 of the field and advise the Owner of measures to be taken to maintain the G-max within the specified limits.

END OF SECTION 33 32 00

FOR INFORMATIONAL PURPOSES

SECTION 33 46 23 SYNTHETIC FIELD SUBSURFACE DRAINAGE

PART 1 – GENERAL

1.1 SUMMARY

- A. Furnish all labor, equipment, and materials to install the Athletic Field Subsurface Drainage System, consisting of perimeter underdrain/collector pipe, geotextile, and stone bases all as indicated on the Contract Drawings and as specified herein.
- B. Related Sections:
 - 1. Section 31 20 00 Earth Moving
 - 2. Section 33 41 00 Storm Utility Drainage Piping
 - 3. Section 33 44 16 Track Edge Drain System

1.2 REFERENCES

- A. Comply with applicable requirements of the following standards. Should the standards conflict with other specified requirements, the most restrictive requirement shall govern.
 - 1. American Association of State Highway and Transportation Officials (AASHTO).
 - 2. American Society for Testing and Materials (ASTM):
 - F 405 Corrugated Polyethylene (PE) Tubing and Fittings
 - F 449 Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control
 - F 667 8-, 10-, 12-, and 15-inch Corrugated Polyethylene Tubing and Fittings
 - 3. State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction – Form 816 dated 2004, with latest Supplements, herein referred to as the Standard Specifications.
 - 4. Occupational Safety and Health Administration (OSHA)

1.3 SUBMITTALS

- A. Provide Shop Drawings for all material to be supplied.
- B. Provide certifications stating that the materials used to comprise the system comply with the requirements.
- C. Provide laboratory test results for sieve analysis, resistance to abrasion, and soundness for all stone materials.

- D. Record Drawings: Submit as-builts of the subbase prior to installation of the resilient polypropylene base. The record drawing of the subbase must be accepted by the engineer/landscape architect prior to work in section being considered complete.

1.4 QUALITY ASSURANCE

- A. Workmen: all workmen shall be thoroughly trained and experienced in the necessary crafts, and completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- B. Codes and Standards: All materials and construction methods shall conform to the Town of Monroe standards and Form 816 - State of Connecticut Department of Transportation "Standard Specification for Road, Bridges, and Incidental Construction" 2004 edition with supplements shall be used for material compliance and execution of the work in this section.
- C. All piping and appurtenances shall be new, clean, and in accordance with material specifications, unless specifically noted on the plans.
- D. Pipe size and classification shall be as shown on the plans or as specified herein.
- E. Stone base material gradations shall be submitted for review prior to delivery of any material.

1.5 PRODUCT DELIVERY

- A. Take all required measures to ensure that all piping and related appurtenances are protected from damage.
- B. Special care shall be exercised during delivery and storage to avoid damage or contamination to the products.
- C. All materials shall be delivered and stored within the Contractor's work limits or in an area approved by the Owner.
- D. Products that are damaged will be removed and replaced unless the product can be repaired in a manner acceptable to the Owner
- E. Protect aggregates and base materials from soil contamination.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Perimeter Underdrain/ Collector Pipe:

1. All specific pipe sizes are noted on the Contract Drawings.
 2. 4" through 10" solid wall and perforated drain pipe shall be smooth interior wall conforming to AASHTO M 252, Hi-Q, as manufactured by Hancor, Inc., Findlay, Ohio or an approved equal.
 3. 12" through 36" solid wall and perforated drain pipe shall be smooth interior wall conforming to AASHTO M 294 Type S, Hi-Q, as manufactured by Hancor, Inc., Findlay, Ohio or an approved equal.
 4. Fittings and couplers shall be split couplings or snap couplings manufactured by the same manufacturer as the corrugated polyethylene pipe.
 5. Approved Equal - ADS N-12 as manufactured by Advanced Drainage Systems.
 6. Underdrain/Collector Pipe bedding shall conform to #8 stone of the requirements of Article M01.01 of the Standard Specifications.
- B. Nonwoven geotextile and shall be a nonwoven needle-punched construction and consist of long-chain polymeric fibers composed of polypropylene, polyethylene, or polyamide. The fibers shall be oriented into a multidirectional stable network whereby they retain their positions relative with each other and allow the passage of water as specified. The fabric shall be free of any chemical treatment or coating that reduces permeability and shall be inert to chemicals commonly found in soil. The geotextile shall conform to the following minimum average roll values:

| | | |
|--------------------------------|-------------|------------------------------|
| Weight | ASTM D-3776 | 4.0 |
| Tensile Strength | ASTM D-4632 | 100 |
| Elongation % | ASTM D-4632 | 50 |
| Puncture, lb | ASTM D-751 | 50 |
| Mullen Burst, psi | ASTM D-3786 | 200 |
| Trapezoidal Tear, lb | ASTM D-4533 | 42 |
| Coefficient of Permeability | ASTM D-4491 | .1 cm/sec |
| Flow Rate, gpm/ft ² | ASTM D-4491 | 100 |
| Permittivity, 1/sec | ASTM D-4491 | 1.8 |
| Apparent Opening Size | ASTM D-4751 | 70 Max. US Std Sieve Opening |
| Seam Strength, lb/ft | ASTM D-4595 | 100 |
| Fungus | ASTM G-21 | No growth |

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine the areas and conditions under which the subsurface drainage system work is to be installed. Correct any and all conditions detrimental to the proper completion of the work. Do not proceed with the work until satisfactory conditions have been achieved.

- B. Provide a survey of the finished subbase prior to installation of the resilient polypropylene base for review and approval by the engineer. The as-built shall indicate spot elevations 25 feet on center, including elevations at the crown along the entire length of the subgrade. Correct all deficiencies as necessary.
- C. Do not proceed with any installations before receiving written approval from the Owner for the material.

3.2 PERIMETER UNDERDRAIN/COLLECTOR PIPE

- A. Install pipe and bedding in conformance with the Storm Drainage requirements of these specifications and as recommended by the pipe manufacturer.
- B. Excavation for installation of pipes shall be in trenches to the lines, grades and widths as per the Contract Drawings and in accordance with Safety and Health Regulations (OSHA).
- C. After installation of pipe, inspect to determine whether line displacement or other damage has occurred.
- D. Make inspections after lines have been installed prior to backfilling and during the backfilling process and again at the completion of backfilling. Backfill material shall conform to the material as specified on the contract drawings.
- E. If inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects, take whatever steps are necessary to correct such defects.

3.3 GEOTEXTILE

- A. The geotextile fabric shall be installed as per Manufacturer's recommendations on the entire surface of the finished subgrade.

3.4 STONE BASES

- A. Upon the completion of constructing an approved field subgrade, the Contractor shall install both the aggregate base layer.
- B. The surface of the stone base layer shall be formed to meet the design elevations to within 1/2", and the surface shall not deviate more than 1/4" over 10' in any direction.
- C. Check surface tolerance prior to installation of geotextile fabric and resilient polypropylene shock/drainage pad.
- D. Provide a survey of the aggregate base prior to installation of the geotextile fabric and resilient polypropylene shock/drainage pad for review and approval by the engineer and synthetic turf vendor/installer. The as-built shall indicate spot elevations 25 feet on

center, including elevations at the crown along the entire length of the base. Correct all deficiencies as necessary.

END OF SECTION 33 46 23

GENERAL INFORMATION SPECIFICATIONS

**MASUK HIGH SCHOOL
SYNTHETIC IN-FILLED ATHLETIC TURF
MONROE, CONNECTICUT**

PROPOSAL FORM

FROM: _____
Synthetic Turf Manufacturer

Product Name

TO: Monroe Board of Education
375 Monroe Turnpike
Monroe, CT 06468

Ladies and Gentlemen:

The undersigned, having carefully examined the Request for Proposal requirements, Drawings, and Project Specifications prepared by Milone & MacBroom, Inc., hereby offers and agrees as follows:

To provide all labor, materials, equipment, and all else necessary to supply and install synthetic athletic turf (to include inlaid football, field hockey, soccer, and boy's and girl's lacrosse stripping), organic infill and resilient polypropylene shock/drainage pad at Masuk High School in accordance with the Proposal Documents.

TOTAL LUMP SUM PROPOSAL BASE PRICE

WRITTEN IN WORDS _____

_____ **DOLLARS**

WRITTEN IN FIGURES \$ _____

Construction is expected to begin on or around June 15, 2016 with final completion of the project 90 days thereafter. The turf manufacturer will be expected to work with the selected contractor to manufacture/furnish and install the field within these specified time frames. Bidders will be expected to hold their prices for 120 days.

ALTERNATE PROPOSAL ITEMS

The undersigned Synthetic Turf Manufacturer further proposes and agrees that should any or all the following Alternates be accepted and included in the Contract, the amount of the Total Lump Sum Proposal Base Price, as heretofore stated, shall be adjusted by the amounts stated for the accepted Alternate(s). All materials and workmanship shall be in strict accordance with the Drawings and Specifications, and shall be "in-place" prices including all overhead and profit.

ALTERNATE BID ITEM NO. A 1

Turf manufacturer/vendor shall maintain the synthetic turf field for the life of the warranty. This effort should be anticipated to include the following services at a minimum:

- Provide and install necessary supplemental organic infill material at the 2, 4, and 6 year anniversary of substantial completion for the project.
- Provide labor and equipment necessary to groom and decompact the field surface at the 2, 4, and 6 year anniversary of substantial completion for the project.
- Provide guidance to the owner on best practices to maintain the field during the interim periods of turf manufacturer maintenance.

| ITEM NO. | ALTERNATE BID ITEM DESCRIPTION (ITEM PRICE IN WORDS – DOLLARS AND CENTS) | ITEM PRICE (IN FIGURES) |
|----------|---|----------------------------|
| A 1 | FIELD MAINTENANCE _____per LS | \$ |

ALTERNATE BID ITEM NO. A 2

| ITEM NO. | ALTERNATE BID ITEM DESCRIPTION (ITEM PRICE IN WORDS – DOLLARS AND CENTS) | ITEM PRICE (IN FIGURES) |
|----------|---|----------------------------|
| A 2 | FURNISH AND INSTALL CENTER FIELD "M" LOGO _____per LS | \$ |
| A3 | FURNISH AND INSTALL END ZONE LETTERING _____per LS | \$ |

SUBMITTED BY:

| | | | |
|-----------------------------|--------------|------------------|-------|
| _____ | | _____ | |
| Synthetic Turf Manufacturer | | Address | |
| _____ | | _____ | |
| City and State | | Authorized Agent | Title |
| Date: _____ | Phone: _____ | Fax: _____ | |

Enclosures:

Included with this proposal are:

1. Letter of interest
2. Experience of the company
3. List of completed fields
4. Samples of synthetic turf, organic infill materials, and resilient polypropylene base
5. A draft copy of the full warranty policy and forms for the turf, organic infill, and resilient polypropylene base

5660-02-a1916-specs

PREVAILING WAGES

Project: Masuk High School Track And Field Improvements

**Minimum Rates and Classifications
for Heavy/Highway Construction**

**Connecticut Department of Labor
Wage and Workplace Standards Division**

ID#: H 22041

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: 5660-02

Project Town: Monroe

FAP Number:

State Number:

Project: Masuk High School Track And Field Improvements

| CLASSIFICATION | Hourly Rate | Benefits |
|-----------------------|--------------------|-----------------|
|-----------------------|--------------------|-----------------|

01) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. **See Laborers Group 5 and 7**

| | | |
|----------------|-------|------------|
| 1) Boilermaker | 33.79 | 34% + 8.96 |
|----------------|-------|------------|

| | | |
|---|-------|-------|
| 1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons | 33.48 | 28.76 |
|---|-------|-------|

| | | |
|------------------------------|-------|-------|
| 2) Carpenters, Piledrivermen | 31.45 | 23.54 |
|------------------------------|-------|-------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|-------------------|-------|-------|
| 2a) Diver Tenders | 31.45 | 23.54 |
|-------------------|-------|-------|

| | | |
|-----------|-------|-------|
| 3) Divers | 39.91 | 23.54 |
|-----------|-------|-------|

| | | |
|------------------|-------|-------|
| 03a) Millwrights | 31.84 | 23.99 |
|------------------|-------|-------|

| | | |
|--|-------|-------|
| 4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray | 45.95 | 19.35 |
|--|-------|-------|

| | | |
|--------------------------------|-------|-------|
| 4a) Painters: Brush and Roller | 31.52 | 19.35 |
|--------------------------------|-------|-------|

| | | |
|--------------------------|-------|-------|
| 4b) Painters: Spray Only | 34.52 | 19.35 |
|--------------------------|-------|-------|

| | | |
|--------------------------|-------|-------|
| 4c) Painters: Steel Only | 33.02 | 18.55 |
|--------------------------|-------|-------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|-------------------------------|-------|-------|
| 4d) Painters: Blast and Spray | 34.52 | 19.35 |
|-------------------------------|-------|-------|

| | | |
|--------------------------------------|-------|-------|
| 4e) Painters: Tanks, Tower and Swing | 33.52 | 19.35 |
|--------------------------------------|-------|-------|

| | | |
|--|-------|--------------------------|
| 5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9) | 37.62 | 23.00 + 3% of gross wage |
|--|-------|--------------------------|

| | | |
|--|-------|-----------|
| 6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection | 34.47 | 31.09 + a |
|--|-------|-----------|

| | | |
|--|-------|-------|
| 7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9) | 40.62 | 28.91 |
|--|-------|-------|

---LABORERS----

| | | |
|---|-------|-----------|
| 8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist | 28.55 | 18.90 + a |
|---|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| 9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen | 28.80 | 18.90 + a |
|---|-------|-----------|

| | | |
|-------------------------|-------|-----------|
| 10) Group 3: Pipelayers | 29.05 | 18.90 + a |
|-------------------------|-------|-----------|

| | | |
|--|-------|-----------|
| 11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators | 29.05 | 18.90 + a |
|--|-------|-----------|

| | | |
|---|-------|-----------|
| 12) Group 5: Toxic waste removal (non-mechanical systems) | 30.55 | 18.90 + a |
|---|-------|-----------|

| | | |
|-----------------------|-------|-----------|
| 13) Group 6: Blasters | 30.30 | 18.90 + a |
|-----------------------|-------|-----------|

| | | |
|---|-------|-----------|
| Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe) | 29.55 | 18.90 + a |
|---|-------|-----------|

| | | |
|------------------------------------|-------|-----------|
| Group 8: Traffic control signalmen | 16.00 | 18.90 + a |
|------------------------------------|-------|-----------|

Project: Masuk High School Track And Field Improvements

| | | |
|---------------------------|-------|-----------|
| Group 9: Hydraulic Drills | 29.30 | 18.90 + a |
|---------------------------|-------|-----------|

---LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and
Liner Plate Tunnels in Free Air.----

| | | |
|---|-------|-----------|
| 13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders | 32.22 | 18.90 + a |
|---|-------|-----------|

| | | |
|-------------------------|-------|-----------|
| 13b) Brakemen, Trackmen | 31.28 | 18.90 + a |
|-------------------------|-------|-----------|

---CLEANING, CONCRETE AND CAULKING TUNNEL----

| | | |
|--|-------|-----------|
| 14) Concrete Workers, Form Movers, and Strippers | 31.28 | 18.90 + a |
|--|-------|-----------|

| | | |
|-------------------|-------|-----------|
| 15) Form Erectors | 31.60 | 18.90 + a |
|-------------------|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

---ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL
IN FREE AIR:----

| | | |
|---|-------|-----------|
| 16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers | 31.28 | 18.90 + a |
|---|-------|-----------|

| | | |
|---|-------|-----------|
| 17) Laborers Topside, Cage Tenders, Bellman | 31.17 | 18.90 + a |
|---|-------|-----------|

| | | |
|------------|-------|-----------|
| 18) Miners | 32.22 | 18.90 + a |
|------------|-------|-----------|

---TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED
AIR: ----

| | | |
|--------------|-------|-----------|
| 18a) Blaster | 38.53 | 18.90 + a |
|--------------|-------|-----------|

| | | |
|---|-------|-----------|
| 19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders | 38.34 | 18.90 + a |
|---|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| 20) Change House Attendants, Powder Watchmen, Top on Iron Bolts | 36.41 | 18.90 + a |
|---|-------|-----------|

| | | |
|------------------------------|-------|-----------|
| 21) Mucking Machine Operator | 39.11 | 18.90 + a |
|------------------------------|-------|-----------|

---TRUCK DRIVERS---(*see note below)

| | | |
|-----------------|-------|-----------|
| Two axle trucks | 28.83 | 21.39 + a |
|-----------------|-------|-----------|

| | | |
|---------------------------------------|-------|-----------|
| Three axle trucks; two axle ready mix | 28.93 | 21.39 + a |
|---------------------------------------|-------|-----------|

| | | |
|----------------------|-------|-----------|
| Three axle ready mix | 28.98 | 21.39 + a |
|----------------------|-------|-----------|

| | | |
|--|-------|-----------|
| Four axle trucks, heavy duty trailer (up to 40 tons) | 29.03 | 21.39 + a |
|--|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| Four axle ready-mix | 29.08 | 21.39 + a |
| <hr/> | | |
| Heavy duty trailer (40 tons and over) | 29.28 | 21.39 + a |
| <hr/> | | |
| Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids) | 29.08 | 21.39 + a |
| <hr/> | | |
| ---POWER EQUIPMENT OPERATORS--- | | |
| <hr/> | | |
| Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required) | 38.55 | 23.55 + a |
| <hr/> | | |
| Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required) | 38.23 | 23.55 + a |
| <hr/> | | |
| Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required) | 37.49 | 23.55 + a |
| <hr/> | | |

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper) | 37.10 | 23.55 + a |
|---|-------|-----------|

| | | |
|--|-------|-----------|
| Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell) | 36.51 | 23.55 + a |
|--|-------|-----------|

| | | |
|--|-------|-----------|
| Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller. | 36.51 | 23.55 + a |
|--|-------|-----------|

| | | |
|---|-------|-----------|
| Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer). | 36.20 | 23.55 + a |
|---|-------|-----------|

| | | |
|---|-------|-----------|
| Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and Under Mandrel). | 35.86 | 23.55 + a |
|---|-------|-----------|

| | | |
|--|-------|-----------|
| Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine. | 35.46 | 23.55 + a |
|--|-------|-----------|

| | | |
|--|-------|-----------|
| Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder). | 35.03 | 23.55 + a |
|--|-------|-----------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc. 32.99 23.55 + a

Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment. 32.99 23.55 + a

Group 12: Wellpoint Operator. 32.93 23.55 + a

Group 13: Compressor Battery Operator. 32.35 23.55 + a

Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain). 31.21 23.55 + a

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator. 30.80 23.55 + a

Group 16: Maintenance Engineer/Oiler 30.15 23.55 + a

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

| | | |
|---|-------|-----------|
| Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator. | 34.46 | 23.55 + a |
|---|-------|-----------|

| | | |
|---|-------|-----------|
| Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license). | 32.04 | 23.55 + a |
|---|-------|-----------|

**NOTE: SEE BELOW

---LINE CONSTRUCTION---(Railroad Construction and Maintenance)---

| | | |
|--|-------|-------------|
| 20) Lineman, Cable Splicer, Technician | 45.43 | 6.25%+19.20 |
|--|-------|-------------|

| | | |
|------------------------------|-------|-------------|
| 21) Heavy Equipment Operator | 40.89 | 6.25%+17.18 |
|------------------------------|-------|-------------|

| | | |
|--|-------|-------------|
| 22) Equipment Operator, Tractor Trailer Driver, Material Men | 38.62 | 6.25%+16.68 |
|--|-------|-------------|

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

23) Driver Groundmen 24.99 6.25%+10.87

23a) Truck Driver 34.07 6.25%+15.41

---LINE CONSTRUCTION---

24) Driver Groundmen 30.92 6.5% + 9.70

25) Groundmen 22.67 6.5% + 6.20

26) Heavy Equipment Operators 37.10 6.5% + 10.70

27) Linemen, Cable Splicers, Dynamite Men 41.22 6.5% + 12.20

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

28) Material Men, Tractor Trailer Drivers, Equipment Operators

35.04

6.5% + 10.45

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.*

***Note: Hazardous waste premium \$3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$3.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - \$1.50 extra

Crane with 200 ft. boom (including jib) - \$2.50 extra

Crane with 250 ft. boom (including jib) - \$5.00 extra

Crane with 300 ft. boom (including jib) - \$7.00 extra

Crane with 400 ft. boom (including jib) - \$10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

As of:

Friday, April 22, 2016

Project: Masuk High School Track And Field Improvements

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of:

Friday, April 22, 2016



Opportunity * Guidance * Support



THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

**If you have QUESTIONS regarding your wages
CALL (860) 263-6790**

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

Sec. 31-53b. Construction safety and health course. New miner training program. Proof of completion required for mechanics, laborers and workers on public works projects. Enforcement. Regulations. Exceptions. (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (g) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any person required to complete a course or program under subsection (a) of this section who has not completed the course or program shall be subject to removal from the worksite if the person does not provide documentation of having completed such course or program by the fifteenth day after the date the person is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2009, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) This section shall not apply to employees of public service companies, as defined in section 16-1, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

(P.A. 06-175, S. 1; P.A. 08-83, S. 1.)

History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g), requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting "person" for "employee" and adding "or program", amended Subsec. (c) by adding "or in accordance with Federal Mine Safety and Health Administration Standards" and setting new deadline of January 1, 2009, deleted former Subsec. (d) re "public building", added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007*, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

November 29, 2006

Notice
To All Mason Contractors and Interested Parties
Regarding Construction Pursuant to Section 31-53 of the
Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.
- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

STATUTE 31-55a

- SPECIAL NOTICE -

To: All State and Political Subdivisions, Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the **contractor's** responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. For those without internet access, please contact the division listed below.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.

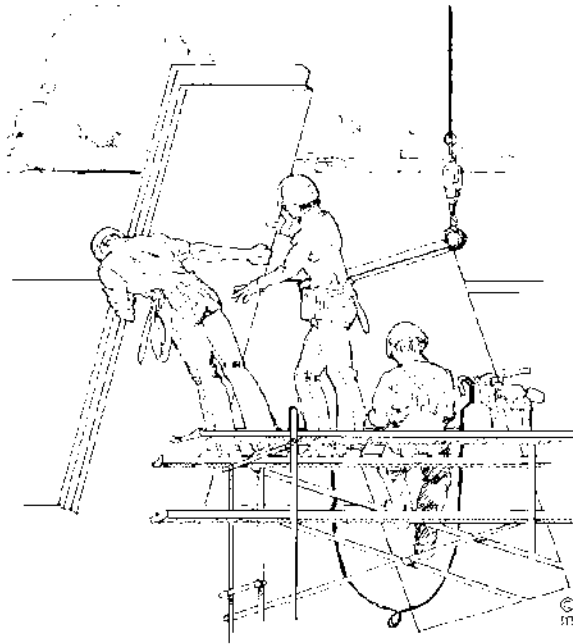
~NOTICE~

TO ALL CONTRACTING AGENCIES

Please be advised that Connecticut General Statutes Section 31-53, requires the contracting agency to certify to the Department of Labor, the total dollar amount of work to be done in connection with such public works project, regardless of whether such project consists of one or more contracts.

Please find the attached “Contracting Agency Certification Form” to be completed and returned to the Department of Labor, Wage and Workplace Standards Division, Public Contract Compliance Unit.

 Inquiries can be directed to (860)263-6543.



CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION
CONTRACT COMPLIANCE UNIT

CONTRACTING AGENCY CERTIFICATION FORM

I, _____, acting in my official capacity as _____,
authorized representative title

for _____, located at _____,
contracting agency address

do hereby certify that the total dollar amount of work to be done in connection with
_____, located at _____,
project name and number address

shall be \$_____, which includes all work, regardless of whether such project
consists of one or more contracts.

CONTRACTOR INFORMATION

Name: _____

Address: _____

Authorized Representative: _____

Approximate Starting Date: _____

Approximate Completion Date: _____

Signature

Date

Return To: Connecticut Department of Labor
Wage & Workplace Standards Division
Contract Compliance Unit
200 Folly Brook Blvd.
Wethersfield, CT 06109

Date Issued: _____

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM
Construction Manager at Risk/General Contractor/Prime Contractor

I, _____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

Street

City

and all of its subcontractors will pay all workers on the

Project Name and Number

Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

Signed

Subscribed and sworn to before me this _____ day of _____, _____.

Notary Public

Return to:
Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker’s compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care _____ 4) Disability _____
- 2) Pension or retirement _____ 5) Vacation, holiday _____
- 3) Life Insurance _____ 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____ of _____, (hereafter known as Employer) in my capacity as _____ (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such person is covered by a worker’s compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such persons name first appears.

(Signature) (Title) Submitted on (Date)

[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

| PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS | | | | | | | | | | | Connecticut Department of Labor Wage and Workplace Standards Division 200 Folly Brook Blvd. Wethersfield, CT 06109 | | | | | | | | | | | |
|--|------------------|------------------------|---|--------------|----|--|----|----|----|----------------|---|---|--|------------------|-------------------|------------|--|---------------------|--------------------|-------------------|--|--|
| In accordance with Connecticut General Statutes, 31-53 Certified Payrolls with a statement of compliance shall be submitted monthly to the contracting agency. | | | | | | | | | | | WEEKLY PAYROLL | | | | | | | | | | | |
| CONTRACTOR NAME AND ADDRESS: Landon Corporation, 15 Connecticut Avenue, Northford, CT 06472 | | | | | | SUBCONTRACTOR NAME & ADDRESS XYZ Corporation 2 Main Street Yantic, CT 06389 | | | | | WORKER'S COMPENSATION INSURANCE CARRIER Travelers Insurance Company POLICY # #BAC8888928 EFFECTIVE DATE: 1/1/09 EXPIRATION DATE: 12/31/09 | | | | | | | | | | | |
| PAYROLL NUMBER | Week-Ending Date | PROJECT NAME & ADDRESS | | | | | | | | Total ST Hours | BASE HOURLY RATE | TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back) | GROSS PAY FOR ALL WORK PERFORMED THIS WEEK | TOTAL DEDUCTIONS | | | GROSS PAY FOR THIS PREVAILING RATE JOB | CHECK # AND NET PAY | | | | |
| | | DAY AND DATE | | | | | | | | | | | | FICA | FEDERAL | STATE | | | LIST OTHER | | | |
| PERSON/WORKER, ADDRESS and SECTION | APPR RATE % | MALE/FEMALE AND RACE* | WORK CLASSIFICATION | S | M | T | W | TH | F | S | Total O/T Hours | TOTAL FRINGE BENEFIT PLAN CASH | FICA | WITH-HOLDING | WITH-HOLDING | LIST OTHER | RATE JOB | CHECK # AND NET PAY | | | | |
| Trade License Type & Number - OSHA 10 Certification Number | | | | 20 | 21 | 22 | 23 | 24 | 25 | 26 | HOURS WORKED EACH DAY | | | | | | | | | | | |
| Robert Craft 81 Maple Street Willimantic, CT 06226 | | M/C | Electrical Lineman E-1 1234567 Owner OSHA 123456 | | 8 | 8 | 8 | 8 | 8 | | S-TIME 40 | \$ 30.75 Base Rate | 1. \$ 5.80 2. \$ 3. \$ 2.01 | \$1,582.80 | | | | P-xxxx | \$1,582.80 | #123 \$ xxx.xx | | |
| | | | | | | | | | | O-TIME | \$ 8.82 Cash Fringe | 4. \$ 5. \$ 6. \$ | | | | | | | | | | |
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| Ronald Jones 212 Elm Street Norwich, CT 06360 | 65% | M/B | Electrical Apprentice OSHA 234567 | | 8 | 8 | 8 | 8 | 8 | | S-TIME 40 | \$ 19.99 Base Rate | 1. \$ 2. \$ 3. \$ | \$1,464.80 | xx.xx | xxx.xx | xx.xx | G-xxx | \$1,464.80 | #124 \$xxx.xx | | |
| | | | | | | | | | | O-TIME | \$ 16.63 Cash Fringe | 4. \$ 5. \$ 6. \$ | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | |
| Franklin T. Smith 234 Washington Rd. New London, CT 06320 SECTION B | | M/H | Project Manager | | | 8 | | | | | S-TIME 8 | \$ Base Rate | 1. \$ 2. \$ 3. \$ | \$1,500.00 | xx.xx | xx.xx | xx.xx | M-xx.x | | xxx.xx | | |
| | | | | | | | | | | O-TIME | \$ Cash Fringe | 4. \$ 5. \$ 6. \$ | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | |
| 7/13/2009 WWS-CP1 | | | | *IF REQUIRED | | | | | | | | | | | *SEE REVERSE SIDE | | | | PAGE NUMBER 1 OF 2 | | | |

OSHA 10 ~ATTACH CARD TO 1ST CERTIFIED PAYROLL

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker's compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care Blue Cross 4) Disability _____
- 2) Pension or retirement _____ 5) Vacation, holiday _____
- 3) Life Insurance Utopia 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of 9/26/09,

I, Robert Craft of XYZ Corporation, (hereafter known as

Employer) in my capacity as Owner (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such employee to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such employee of the Employer is covered by a worker's compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such employee's name first appears.

Robert Craft owner 10/2/09
 (Signature) (Title) Submitted on (Date)

Section B: Applies to CONNDOT Projects ONLY

That pursuant to CONNDOT contract requirements for reporting purposes only, all employees listed under Section B who performed work on this project are not covered under the prevailing wage requirements defined in Connecticut General Statutes Section 31-53.

Robert Craft owner 10/2/09
 (Signature) (Title) Submitted on (Date)

Note: CTDOL will assume all hours worked were performed under Section A unless clearly delineated as Section B WWS-CP1 as such. Should an employee perform work under both Section A and Section B, the hours worked and wages paid must be segregated for reporting purposes.

*****THIS IS A PUBLIC DOCUMENT***
DO NOT INCLUDE SOCIAL SECURITY NUMBERS**

**Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES**

⇒ Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

- a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

- a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year’s Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

- a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

- a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

- a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

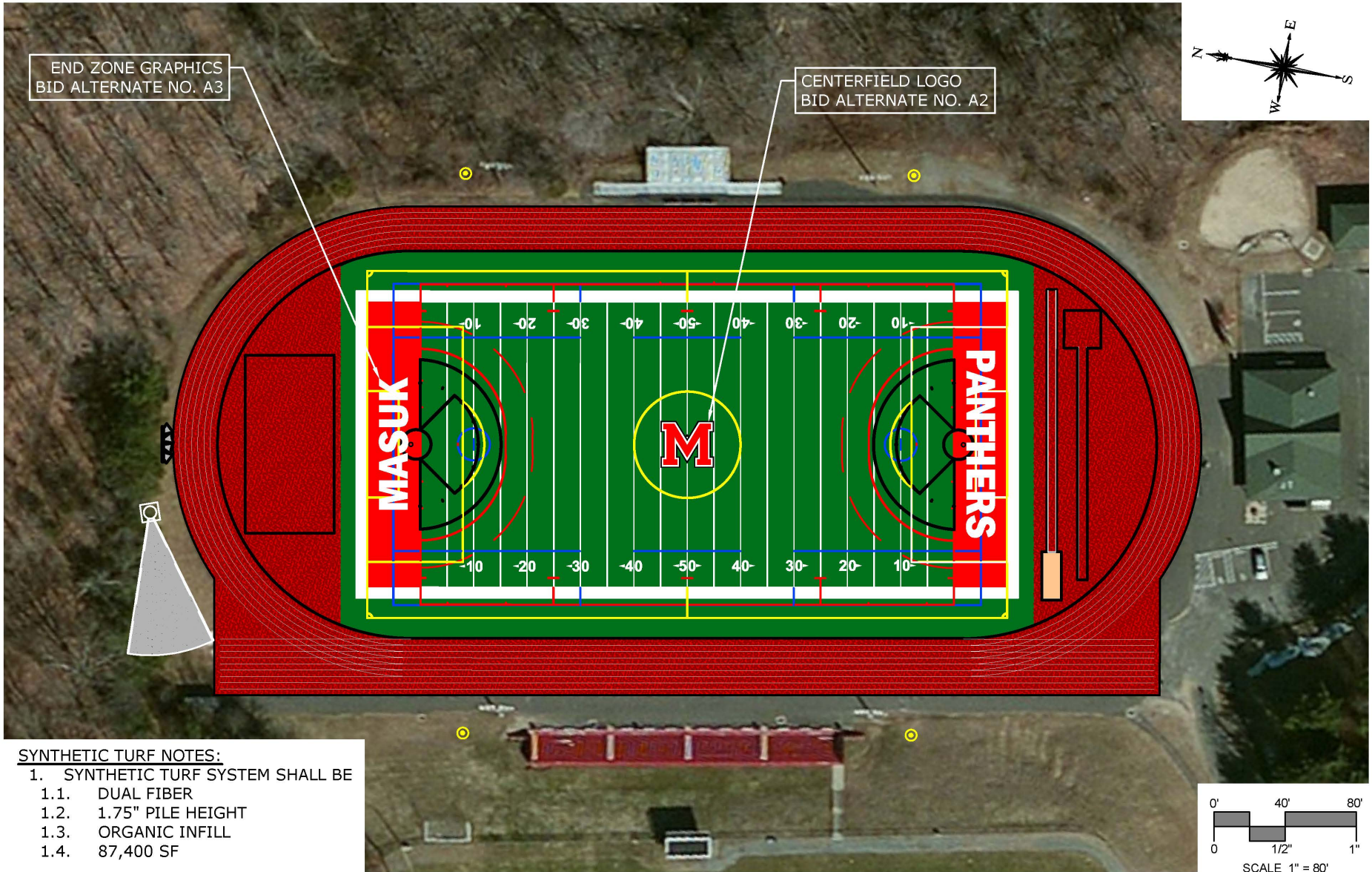
(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

APPENDIX

Drawing: W:\DESIGN\5660-02-DE\CAD\NONLANSSET\MHS-TURF_BIDDING_Layout_TotTURF_RFP_1

Plotted by: HANNAHR On this date: Wed, 2016 April 20 - 2:46pm



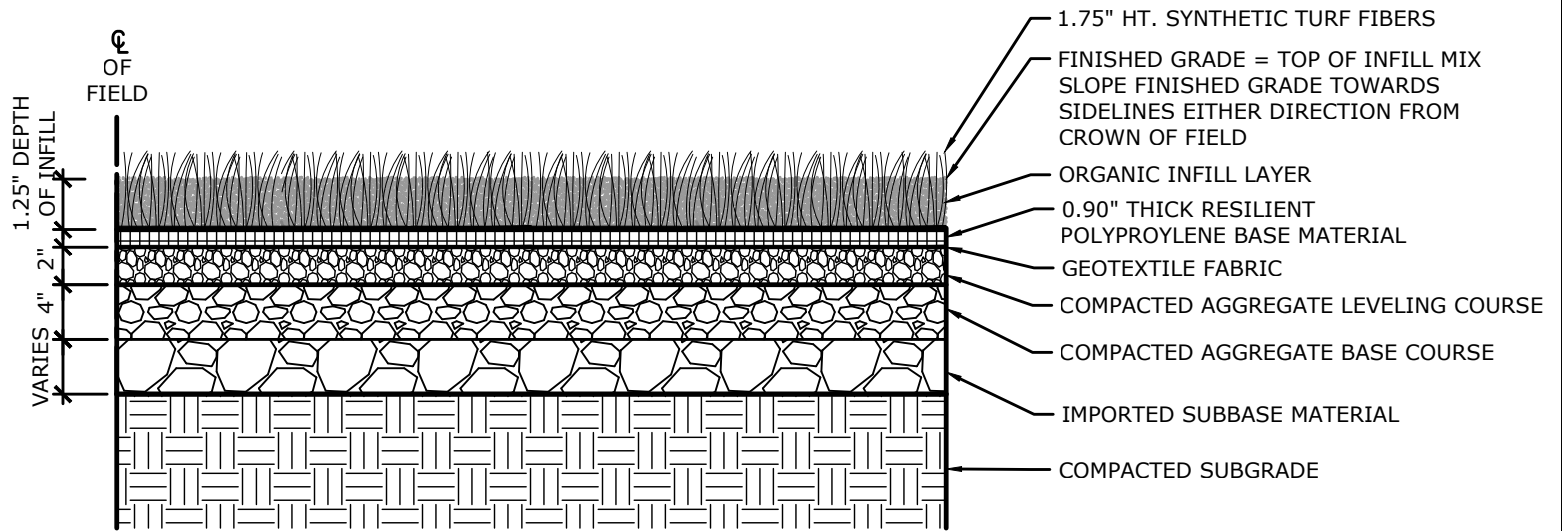
- SYNTHETIC TURF NOTES:**
1. SYNTHETIC TURF SYSTEM SHALL BE
 - 1.1. DUAL FIBER
 - 1.2. 1.75" PILE HEIGHT
 - 1.3. ORGANIC INFILL
 - 1.4. 87,400 SF

MILONE & MACBROOM
 99 Realty Drive
 Cheshire, Connecticut 06410
 (203) 271-1773 Fax (203) 272-9733
 www.miloneandmacbroom.com

| | |
|-----------|----------------|
| DATE | APRIL 19, 2016 |
| SCALE | 1"=80' |
| PROJ. NO. | 5660-02 |
| DESIGNED | KCF |
| DRAWN | HAR |
| CHECKED | DJK |

SYNTHETIC TURF RFP
MASUK HIGH SCHOOL
TRACK & FIELD IMPROVEMENTS
 1014 MONROE TURNPIKE
 MONROE, CONNECTICUT

DRAWING NAME:
1 OF 4



NOTES:

1. SLOPE SUBGRADE, LEVELING COURSE, DRAINAGE BOARD/SHOCK PAD AND TURF AT 0.5% TOWARD THE COLLECTOR PIPE FROM CENTER LINE OF THE FIELD.

SYNTHETIC INFILL TURF

N.T.S.

TURF STRIPING NOTES

1. FOOTBALL FIELD: ALL INLAID AND TUFTED LINES AND MARKINGS, COLOR: WHITE
2. SOCCER FIELD: ALL INLAID AND TUFTED LINES, COLOR: YELLOW (DIMENSIONS: 360'x200')
3. FIELD HOCKEY: ALL INLAID AND TUFTED LINES, COLOR: RED
4. BOYS LACROSSE: ALL INLAID AND TUFTED LINES, COLOR: BLUE
5. GIRLS LACROSSE: ALL INLAID AND TUFTED LINES, COLOR: BLACK
6. ALL STRIPING SHALL CONFORM TO NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFHS) STANDARDS.
7. MANUFACTURER TO PROVIDE COLOR SAMPLES FOR FINAL APPROVAL.

MILONE & MACBROOM
 99 Realty Drive
 Cheshire, Connecticut 06410
 (203) 271-1773 Fax (203) 272-9733
 www.miloneandmacbroom.com

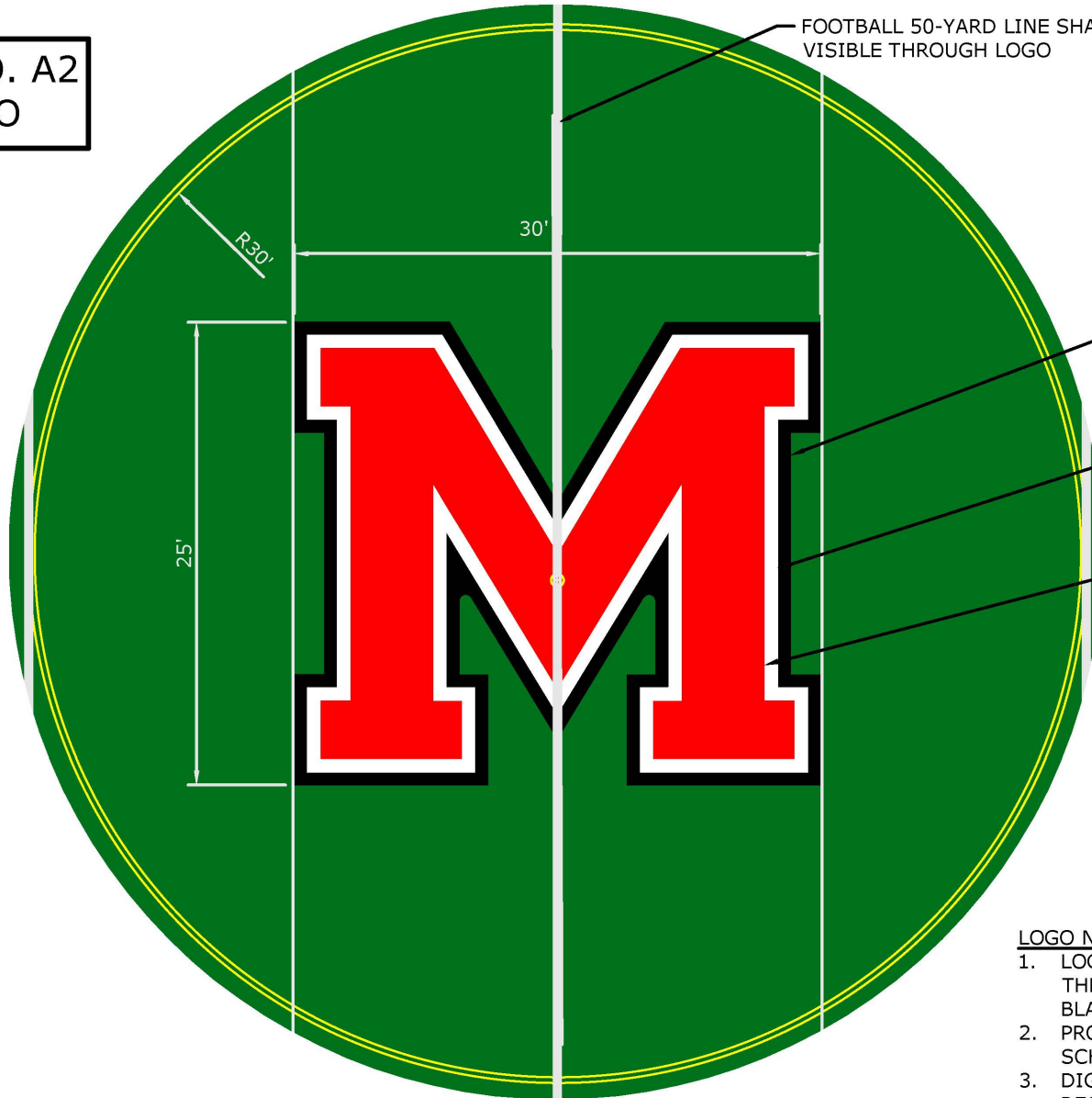
| | |
|-----------|----------------|
| DATE | APRIL 19, 2016 |
| SCALE | NT.S. |
| PROJ. NO. | 5660-02 |
| DESIGNED | KCF |
| DRAWN | HAR |
| CHECKED | DJK |

SYNTHETIC TURF RFP
MASUK HIGH SCHOOL
TRACK & FIELD IMPROVEMENTS
 1014 MONROE TURNPIKE
 MONROE CONNECTICUT

DRAWING NAME:

2 OF 4

**BID ALT. NO. A2
"M" LOGO**



FOOTBALL 50-YARD LINE SHALL BE VISIBLE THROUGH LOGO

COLOR NUMBER 1
COLOR: BLACK

COLOR NUMBER 2
COLOR: WHITE

COLOR NUMBER 3
COLOR: RED

LOGO NOTES

1. LOGO SHALL BE COMPRISED OF THREE COLORS, RED, WHITE & BLACK.
2. PROVIDE COLOR SAMPLES TO SCHOOL FOR APPROVAL.
3. DIGITAL FILE AVAILABLE UPON REQUEST.
4. PROVIDE SHOP DRAWINGS FOR APPROVAL.

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

| | |
|-----------|----------------|
| DATE | APRIL 19, 2016 |
| SCALE | 1"=10' |
| PROJ. NO. | 5660-02 |
| DESIGNED | KCF |
| DRAWN | HAR |
| CHECKED | DJK |

SYNTHETIC TURF RFP
MASUK HIGH SCHOOL
TRACK & FIELD IMPROVEMENTS
1014 MONROE TURNPIKE
MONROE CONNECTICUT

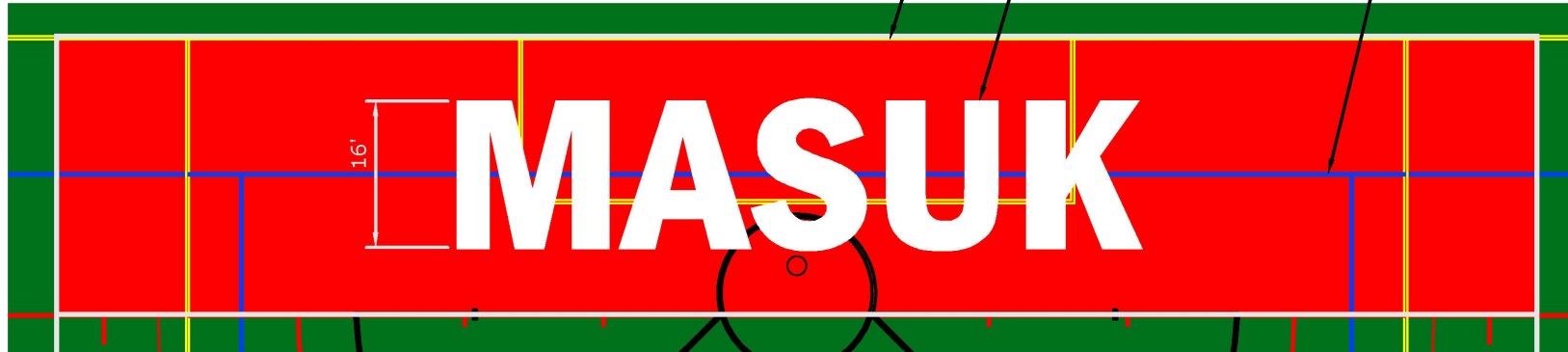
DRAWING NAME:
3 OF 4

**BID ALT. NO. A3
END ZONE GRAPHICS**

COLOR NUMBER 1
COLOR: RED

COLOR NUMBER 2
COLOR: WHITE

FIELD STRIPING SHALL
BE VISIBLE THROUGH
END ZONE COLOR



LOGO NOTES

1. END ZONE GRAPHICS SHALL BE COMPRISED OF TWO COLORS, RED & WHITE.
2. PROVIDE COLOR SAMPLES TO SCHOOL FOR APPROVAL.
3. DIGITAL FILE AVAILABLE UPON REQUEST.
4. PROVIDE SHOP DRAWINGS FOR APPROVAL.

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