GREENWICH PUBLIC SCHOOLS

Bid No # 2285-19
Bid Advertise Date: December 20, 2019
Bid Opening Date: January 20, 2020 @ 10 am

PROJECT MANUAL

Hamilton Avenue School
Natural Grass Field Reconstruction
184 Hamilton Avenue
Greenwich, Connecticut
December 20, 2019

PROJECT MANUAL INDEX

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Information to Bidders

The contact for the Owner is: Eugene Watts, Senior Buyer**,** Greenwich Public Schools, Havemeyer Building, 290 Greenwich Avenue, Greenwich, CT.

Contractor(s) whose bid exceeds $500,000.00 shall hold a current "DAS" Contractor Prequalification Certificate" (not a predetermination letter) from the Department of Administrative Services of the State of Connecticut according to Connecticut General Statutes Section 4a-100, 4b-101 and 4b-91 previously stated as Public Act 03-215 and as amended by Public Act 04-141. Bidders shall submit with their bids, unless noted otherwise, a "DAS Contractor Prequalification Certificate" along with a current "Update (bid) Statement". Failure to submit those items with the bid will result in disqualification of the bidder. If you have any questions regarding these requirements contact the State of CT.DAS, at telephone number 860-713-5280 or visit their web site at www.das.state.ct.us <http://www.das.state.ct.us/>.

1. BACKGROUND:

   The Town of Greenwich, CT is about 30 miles northeast of New York City and has a population of about 60,000 people. The Greenwich Public Schools enjoy a national reputation for excellence and have strong support from the community. Our fifteen public schools have a current enrollment of 9000 students and consist of eleven elementary schools (K-5), three middle schools (6-8), and one comprehensive high school (9-12). Our district also offers some pre-K and alternative high schools programs.

2. CONTRACT LENGTH:

   This Bid is for awarding a contract to cover the period beginning **February 1, 2020 and with completion by December 31, 2020 with an option to extend. Weather permitting, site work is anticipated to begin in the spring of 2020, with substantial completion anticipated by September 1, 2020.** Once this Bid is awarded, the bidder must make arrangements to meet with Greenwich Public Schools if required.

3. OPTION TO EXTEND:

   The Board of Education may, at their option and with the approval of the vendor, extend the period of this agreement for the schools. If the Board of Education intends to extend the contract period, the vendor shall be notified in writing by the Purchasing Department at least fourteen (14) calendar days prior to the expiration of the original contract.

4. BID EVALUATION CRITERIA:

   A committee composed of various administrators will evaluate bids. The following criteria guidelines will be used in analyzing and evaluating this bid:

   Conformance to the requirements of this Bid, i.e. conformance to Terms, Conditions and Scope of Work.
   Proven skills and technical competence.
   Background on the firm
   For Vendor firm, identification of personnel who will have principal responsibility. Qualifications Form

5. A NARRATIVE DESCRIBING THE FIRMS APPROACH TO UNDERTAKING THE SCOPE OF THE WORK INCLUDING:

   Cost/service fee (overall cost to the Board of Education with all factors considered). Presentation to the selection committee, if requested.

6. AWARD OF CONTRACT:

   The contract will be awarded by the Board of Education to the qualified firm or person at compensation determined to be fair and reasonable considering budgetary limitations, scope, complexity and the nature of goods and/or services.

7. PURPOSE:

Greenwich Public Schools is soliciting bids to provide **reconstruction of the natural grass athletic fields** at **Hamilton Avenue School** for the Greenwich Public School District.

8. OVERVIEW:

Greenwich Public Schools wishes to solicit Request for Bids for **Hamilton Avenue School Natural Grass Field Reconstruction,** including alternates. Companies must be located within a 100-mile radius of the district in order to submit a bid. It is understood that any contract is subject to available funding.

9. INTENT OF WORK

Fixed price scope of work per plans and specifications for provision of the **reconstruction of the natural grass athletic field at Hamilton Avenue School, and including the reconstruction of a portion of the ball field, a new baseball backstop, an expanded paved play area and sidewalk reconstruction.**

10. SCOPE OF SERVICE:

Removal and reconstruction of the existing grass athletic field space at the Hamilton Avenue School. Existing topsoil may be stockpiled and reused on site. Athletic field free-draining base material will be imported to the site and used to level the existing playing field surface. The existing ball field skinned infield will either be partially or fully reconstructed with a new chain link fence backstop. Bituminous concrete sidewalks around the perimeter of the field will be removed and reconstructed as indicated on the project drawings. An expanded paved play area will be constructed adjacent to the existing basketball court which is to remain. There will be no irrigation system installed. New tree plantings are also part of the project scope.

11. CONTRACTOR AGREEMENT

1. The contractor shall simultaneously with the signing of the Contract, furnish the Town the executed Performance, Maintenance, and Payment Bond of a surety company authorized to do business in the State of Connecticut, and acceptable to the Town, in the sum of the full amount of the Contract Obligation in the form provided by the Town. A PERFORMANCE BOND will not be required where the total estimated cost of labor and materials under the contract with respect to which such general bid is submitted is less than one-hundred thousand dollars ($100,000.00). Once a contract exceeds $100,000.00 the bidder will be responsible for obtaining and paying for all bonds required by Greenwich Public Schools.

2. Each bid shall be signed and accompanied by a bid security payable to the Town of Greenwich in the amount of ten (10%) percent of the bid and shall be in the form of a Bid Bond only as issued in the bid documents. Bid Bonds must use the Greenwich Public Schools Bid Bond Form (included within the bid documents), issued by a surety Company listed on the Current U.S. Department of Treasury's Federal Register and be licensed to underwrite bonds in the State of Connecticut.

3. Each bid shall be accompanied by a completed copy of the Bidders Qualification Questionnaire included in the bid documents. The Greenwich Public Schools reserve the right to request further information and/or supplemental information with respect to the Qualification Questionnaire at their sole discretion

4. Each bidder shall utilize the specified manufacturers. Should the Contractor desire to substitute other articles, materials, apparatus, products or process, then those specified or approved as equal, the Contractor shall apply to the Architect, in writing, for approval of such substitution, per Section 01600 Product Requirements. It should be noted that the Bid shall not be based on a substituted article, material, apparatus, product or process. No substitution reviews shall take place prior to bid.

5. Each form of bid contains a section for alternates and/or unit prices. All alternate prices must be completed with a dollar value. Blanks, not applicable (n/a), no effect, etc. in these portions of the form of bid shall be construed to indicate that the particular alternate shall be performed without increase to the contract price as they relate to the scope of the trade

package.

6. Unit prices which do not affect the work of your trade may be filled in "not applicable (n/a)". "Not applicable or blanks in these portions of the form of bid shall be construed to indicate that the unit price is not applicable as they relate to the scope of the trade package.

7. The successful bidder will produce for the Greenwich Public Schools review a current financial statement, which will remain strictly confidential.

EXCEPTIONS.

8. Each bid shall be accompanied by a completely filled in and properly executed Non-Collusion Affidavit.

9. All work shall be done in accordance with applicable State statutes; conditions of Prevailing Wages shall apply.

10. Note: Failure to submit a bid with four copies does not constitute a material defect.

11. No Bidder may withdraw their Bid within 90 days after the actual date of Bid Opening.

12. Qualifications to the bid are not allowed. If bids are qualified, they may be deemed non-responsive and subsequently rejected.

13. If there is a conflict between the Contract Agreement and the General Conditions, the Contract Agreement shall prevail.

14. Bid awards must be approved by the Greenwich Public Schools. All contractors shall be required to execute the Greenwich Public Schools standard form of contract and accompanying payment and performance bonds without exception.

i. The contract shall be awarded to the lowest responsible and qualified bidder, meaning the bidder whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary to faithful performance of the work based on objective criteria considering past performance and financial responsibility. In considering past performance, the Greenwich Public Schools shall evaluate the skill, ability and integrity of bidders in terms of the bidders' fulfillment of contract obligations and of the bidders' experience or lack of experience with projects of similar size and scope. The Greenwich Public Schools reserves the right to consider as unqualified to do the work required by the bid documents any bidder that does not habitually perform with its own forces the major portion of the work involved in the bid documents. No contract will be awarded to any bidder who is at time of award not qualified under applicable regulations issued by the Secretary of Labor, United States Department of Labor or any applicable State and local laws and regulations.

ii. After review of all factors, terms, and conditions, including price, the Greenwich Public Schools reserves the right to reject any and all bids, or any part thereof, or waive defects in same.

12. FEE:

Indicate your Bid Fee for all services as described in Part 5. The District reserves the right to provide payment in accordance with completion of services based on the Project Schedule.

13. QUESTIONS:

Questions concerning this bid will be received by email only directed to: at bid_department@greenwich.k12.ct.us. <mailto:bid_department@greenwich.k12.ct.us> In the "Subject" line you must put Bid #2285-19 Title: **Hamilton Avenue School Natural Grass Field Reconstruction** by using the RFI form. No questions will be accepted after noon on **January 10, 2020**. All answers will be published by written Bid Notification Addenda no later than end of day on **January 14, 2020**. It is the responsibility of all bidders to verify that they are current with all.

Failure to comply with these conditions will result in the bidder waiving his right to dispute the bid specifications and conditions. All Addenda will be posted on our website: www.greenwichschools.org <http://www.greenwichschools.org/>up to 72 hours before the bid opens.

14. BID DOCUMENTS:

Specifications can be viewed at the Greenwich Public Schools website: www.greenwichschools.org. <http://www.greenwichschools.org/>

Project Description:

This project involves **the reconstruction of an existing natural grass athletic field, reconstruction of a portion (base bid) of and existing skinned infield ball field and associated backstop fencing, removal and replacement of existing asphalt walks, the addition of an expanded paved play area, and landscape improvements.**

Pre-Bid Conference

There will be a pre-bid conference beginning at **1:00pm on January 7, 2020** at the **Hamilton Avenue School, 184 Hamilton Avenue, Greenwich, CT.** Attendance at the walkthrough is mandatory**.** Following the conference, interested parties may walk the site at the project.

15. ACCEPTANCE:

The department will make determination of the acceptability of work. Work shall be completed in a responsive and professional manner and in accordance with the specifications.

COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
CONTRACT COMPLIANCE REGULATIONS NOTIFICATION TO BIDDERS

AFFIRMATIVE ACTION COMPLIANCE AFFIDAVIT

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a- 60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Com1ecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-7l(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to "aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials." "Minority business enterprise" is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: "(I) Who are active in the daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n." "Minority" groups are defined in Section 32-9n of the Connecticut General Statutes as"(!) Black Americans ...
(2) Hispanic Americans ... (3) persons who have origins in the Iberian Peninsula ... (4) Women ... (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians ... " An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-2l(l l) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder's qualifications under the contract compliance requirements:

(a) the bidder's success in implementing an affirmative action plan;
(b) the bidder's success in developing an apprenticeship program complying with Sections 46a-68-l to 46a- 68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
(c) the bidder's promise to develop and implement a successful affirmative action plan;
(d) the bidder's submission of employment statistics contained in the "Employment Information Form",

indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and

(e) the bidder's promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

***INSTRUCTIONS:** Bidder must sign acknowledgement below and return acknowledgement to Awarding Agency along with bid proposal.

The undersigned acknowledges receiving and reading a copy of the "Notification to Bidders" form.

Signature

On behalf of:
Date

16. Form and Submission of Bid

1. One copy of this document will be furnished to the bidders. The Bid Sheet shall be completed and returned as part of the bid. The copy submitted by the successful bidder shall be completed in its entirety, executed and retained by the Town of Greenwich, sometimes referred to as the Town. From this executed copy, three other conformed copies will be made, one of which will be sent to the Contractor.

2. Bid Documents must be enclosed in a sealed opaque envelope plainly marked on the outside with the name and address of the Contractor; addressed to the Purchasing Agent, Greenwich Public Schools, Havemeyer Building, 290 Greenwich Avenue, Greenwich, Connecticut, and shall be labeled as indicated in Invitation to Bidders.

3. It shall be the responsibility of each Bidder to have his Bid Proposal at the Business Office at the time of Bid Opening; neither the Town of Greenwich nor the Board of Education shall be held in any way for failure of bidder to have his Bid Proposal submitted at such time and Bids arriving after the indicated Bid Opening time will not be accepted. Late bids arriving by mail shall be returned to the sender unopened.

18.Withdrawal of Bids

Except as hereinafter in this subsection expressly provided, once his Bid is submitted and received by the Town for consideration and comparison with the other bids similarly submitted, the Bidder agrees that he may not and will not withdraw it within thirty (30) consecutive calendar days after the actual date of the opening of Bids unless extended byaddendum.

Upon proper written request and identification, Bids may be withdrawn only as follows:

a. At any time prior to the designated time for the opening of bids.

b. Unless a Bid is withdrawn as provided above, the Bidder agrees that it shall be deemed open for acceptance until the Agreement has been executed by both parties thereto or until the Town notifies a Bidder in writing that his Bid is rejected or that the Town does not intend to accept it. Notice of acceptance of a Bid shall not constitute rejection of any other Bid.

19. Bidders to Investigate

Where applicable, Bidders are required to submit their Bids upon the following express conditions which shall apply

to and be deemed a part of every Bid received, "viz".

Bidders must satisfy themselves by personal examination of the site of the work and by such means as they may wish, as to the actual conditions there existing, the character and requirements of the work, and the difficulties attendant upon its execution, and the accuracy of all estimated quantities, if any, stated in the Bid.

20. Ability and Experience of Bidder

No award will be made to any Bidder who cannot satisfy the Town that he has sufficient ability and experience in this class of work and sufficient capital and plant to enable him to prosecute and complete the work successfully within the time named or where such time is not named, within a reasonable period of time as is determined by the contracting officer or agency. The Town's decision or judgment on these matters shall be final, conclusive and binding.

The Town may make such investigations as it deems necessary, and the Bidder shall furnish to the Town, under oath if so required, all such info1111ation and data for this purpose as the Town may requirements.

21. Interpretations

Questions Regarding Drawings and Documents. No answer will be given to prospective Bidders in reply to an oral question if the question involves an interpretation of the intent or meaning of the Drawings, if any, or other Contract Documents or the quality or use of products or methods other than those designated or described on the Drawings, if any, and other Contract Documents, including Addenda, as described below, is given infom1ally, for information and the convenience of the Bidder only, and is not guaranteed. The Bidder agrees that such information shall not be used as the basis of nor shall the giving of such infom1ation entitle the Bidder to assess any claim or demand against the Town or Board of Education.

To receive consideration, such questions shall be submitted in writing to the Board of Education at least ten (I 0) calendar days before the established date for receipt of Bids. If the question involves the quality or use of products or methods, it must be accompanied by Drawings, Specifications, or data in sufficient detail to enable the Board of Education to determine the quality or suitability of the products or method. In general, the Board of Education will neither approve nor disapprove particular products prior to the opening of bids; such products will be considered when offered by the Contractor for incorporation into the work.
The Contracting Officer will set forth as addenda, which shall become a part of the Contract Documents, such questions received as above provided as in his sole judgment are appropriate or necessary and his decision regarding each. At least seven (7) days prior to the receipt of Bids, he will send a copy of these addenda to those prospective Bidders known to have taken out sets of the Drawings and other Contract Documents.

The Contractor agrees to use the products and methods designated or described in the specifications or as amended by the addenda.

a. Bids. The Board of Education reserves the right to reject Bids which in its judgment are either incomplete, conditional, obscure, or not responsible or which contain additions not called for, erasures not properly initialed, alterations or similar irregularities if deemed in the Town's best interest to do so.

b. Right to Reject or Accept Bids. The Board of Education reserves the 1ight to reject any and all bids not deemed to be in the best interest of the Town of Greenwich. The Board of Education reserves the right to waive any informalities in or reject any or all bids, or any part of any bid.

c. Execution of Agreement. The Bidder whose Bid is accepted will be required and agrees to duly execute the Agreement and furnish the required Bond within such time as deemed reasonable by the Town or Contracting Officer.

d. Non-Connecticut Contractors 5 % Tax.
Pursuant to Connecticut General Statutes § 12-430(7), as amended by Public Act No 11,61,Section 66, a non-

resident contractor shall comply with the State of Connecticut's requirements.

22. Bid Bond

a. The Bid Bond form given on the following pages shall be used.

b. The surety on the bond may be any corporation authorized to act as surety in the State of Connecticut.

c. The full name and business or residence address of each individual party to the bond shall be inserted in the space provided therefore, and each party shall sign the bond with his usual signature on the line opposite the scroll seal.

d. If the principals are partners, their individual names shall appear in the space provided therefore, with the recital that they are partners composing a firm, naming it, and the bond shall be executed by a general partner who has been authorized to act on behalf of the partnership.

e. If the principal or surety is a corporation, the name of the state in which incorporate shall be inserted in the space provided therefore, and said instrument shall be executed and attested under the corporate seal, the fact shall be stated, in which case a scroll or adhesive seal shall appear following the corporate name.

f. The official character and authority of the person or persons executing the bond for a corporation shall be certified by a proper officer. In lieu of such certificate, there may be attached to the bond copies of so much of the records of the corporation as will show the official character and authority of the officers signing duly certified by a proper officer, under the corporate seal, to be true copies.

g. The date of this bond must not be prior to the date of the instrument in connection with which it is given.

23. Minimum Wages and Payment to Subcontractors

a. The work specified in this contract is subject to prevailing wage rates as fixed by the Labor
b. Commissioner of the State of Connecticut and a schedule of such rates is deemed to be incorporated herein.
c. A general or prime contractor is required by Connecticut law to pay his subcontractors for labor performed or materials furnished within forty-five (45) days after payment to such general or prime contractor.

The contractor's attention is directed to Section 9 of the Agreement for additional requirements for Employment Preference and Minimum Wage

24. GENERAL TERMS AND CONDITIONS:

Sealed bids for **Natural Grass Field Reconstruction at Hamilton Avenue School** Greenwich Public Schools, as specified on the attached bid specification sheets, will be received at the time and date previously mentioned. All bidders and other interested persons are invited to be present at the opening of these bids that will take place at the Board of Education.

The Board of Education reserves the right to waive any informality in the bid or reject any or all bids or to accept any bid, which appears to be in the best interest of the Board. Any bid may be withdrawn prior to the opening time and date. Any bid received after the time and date as specified will not be considered.

The Board of Education may consider proximity of vendor's service as a factor in determining lowest responsible bid.

If the Board of Education deems il necessary, the Board of Education may postpone the date for the opening of these bids by notifying each bidder by telephone, mail or the issuing of an addendum through

our website.

The Board of Education shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish the Board of Education with information and data for this purpose as the Board of Education may request. The right is reserved to reject any bid where, on investigation, the evidence or information submitted by such bidders does not satisfy the Board of Education that the bidder is qualified to carry out properly the terms of the contract.

Consumption or use of alcohol and/or drugs is prohibited on school property. Any individual with alcohol or drugs will be removed from said property. Smoking is prohibited in all school buildings and on school grounds.

25. TAX:
No amount shall be added for the Connecticut Sales Tax or Federal Tax. The Greenwich Public School system is exempt from the payment of taxes imposed by the Federal Government and/or State of Connecticut. Taxes must not be included in the bid price.

26. Non-Connecticut Contractors.

Pursuant to Connecticut General Statutes §12-430(7), as amended by Public Act No. 11-61, Section 66 a nonresident contractor shall comply with the State of Connecticut's bonding requirements.

27. COLLUSION AMONG BIDDERS:

More than one offer from an individual, firm, partnership, corporation or association under the same or different name will be rejected. Reasonable grounds for believing that a bidder is interested in more than one bid for the work contemplated will cause rejection of all bids in which the bidder is interested. Any or all bidders will be rejected if there is any reason for believing that collusion exists among the bidders.

Participants in such collusion may not be considered in future offers for the same work. Each bidder, by submitting a bid, certifies that it is not a part to any collusive action.

28. EMPLOYMENT DISCRIMINATION BY CONTRACTOR PROHIBITED:

The successful bidder will not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The successful bidder agrees to post in a conspicuous place, available to employees and applicants for employment, notices setting forth the provision of this nondiscrimination clause. The successful bidder in all solicitation or advertisements for employees, placed by or on behalf of the contractor, will state that such successful Bidder is an Equal Opportunity Employer.

Notices, advertisements, and solicitations placed in accordance with Federal Law, rules or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

29. The intention of this BID/RFP is to establish a contract with one or more contractors who will, upon request, provide the time with the services, labor, and supplies described in this solicitation.

This is no guarantee as to the amount of services, labor or supplies that the Board of Education may purchase during the term of this contract.

30. Per Connecticut General Statutes CGS § 10-221d, which went into effect July 1, 2016, and 10-222c, all people who are entering into a paid agreement with a school district must submit to a mandatory background check. If you are an individual, you must send me your employment history so that I can do the background check. If you are a company having multiple employees in the schools, you will be responsible for obtaining the background checks on each of your employees.

INSURANCE PROCEDURE

PLEASE NOTE:

THIS PAGE MUST BE RETURNED WITH YOUR BID/RFP. FAILURE TO DO SO MAY RESULT IN YOUR BID/RFP BEING REJECTED.

Please take the insurance requirements of the Contract to your agent/broker immediately upon receipt of the bid documents to determine your existing coverage and any costs for new or additional coverage required for the work noted in this Request for B1D/RFP. Any BID/RFP with deficient insurance requirements will be rejected.

STATEMENT OF VENDOR:

I have read the insurance requirements for this work and have taken the documentation to my insurance agent/broker. The B1D/RFP cost reflects any additional costs relating to insurance requirements for this work.

Signature

Date

Insurance Requirement Sheet

Insurance Requirements: Before starting and until final completion and acceptance of the work called for **in** the Contract and expiration of the guarantee period provided for **in** the Contract, the Contractor and its subcontractors, if any, shall procure and maintain insurance of the types and amounts checked in paragraphs A through **F** below for all Contract operations.

A. General Liability, with minimum coverages for combined bodily injury and property damage liability of $2,000,000 general aggregate, $1,000,000 per occurrence including:

1. Commercial General Liability.
2. Town as additional insured.
3, Owners and Contractors Protective Liability (separate policy in the name of the Town).

B. Comprehensive Automobile Liability, with minimum coverages of $1,000,000 combined single limit for bodily injury and property damage, including, where applicable, coverage for any vehicle, all owned vehicles, scheduled vehicles, hired vehicles, non-owned vehicles and garage liability.

C. Excess Liability, with minimum coverage of $5,000,000 in umbrella form, or such other form as approved by Town Department Head and Risk Management Director.

D. Workers' Compensation and Employer's Liability, with minimum coverages as provided by Connecticut State Statutes,

E. Professional Liability (for design and other professionals for Errors and Omissions), with minimum coverage of $1,000,000. If the policy is on a claims-made basis, coverage shall be continually renewed or extended for three (3) years after work is completed under the Contract.

A. ☐ F.

G.

Other (Builder's Risk, etc.):_____

CERTIFICATE HOLDER: TOWN OF GREENWICH

ATTN: BOARD OF EDUCATION. (Also fill in on ACORD Certificate of Insurance) 290 Greenwich Avenue, Greenwich, CT 06830.

The Acord certificate of insurance form must be executed by your insurance agent/broker and returned to this office. Company name and address must conform on all documents including insurance documentation. It is required that the agent/broker note the individual insurance companies providing coverage, rather than the insurance group, on the Acord form. The Contract number (provided to the awarded Contractor), project name and a brief description must be inserted in the "Description of Operations" field. It must be confirmed on the Acord Form that the Town of Greenwich is endorsed as an additional insured by having the appropriate box checked off and stating such in the "Description of Operations" field. A letter from the awarded vendor's agent/broker certifying that the Town of Greenwich has been endorsed onto the general liability policy as an additional insured is also mandatory. This letter must follow exactly the format provided by the Purchasing Department and must be signed by the same individual authorized representative who signed the Acord form. If the insurance coverage required is provided on more than one Acord certificate of insurance, then additional endorsement letters are also required. Contract development will begin upon receipt of complete, correct insurance documentation.

The Contractor shall be responsible for maintaining the above insurance coverages in force to secure all of the Contractor's obligations under the Contract with an insurance company or companies with an AM Best Rating of B+:VII or better, licensed to write such insurance in Connecticut and acceptable to the Risk Manager, Town of Greenwich. For excess liability only, non-admitted insurers are acceptable, provided they are permitted to do business through Connecticut excess line brokers per listing on the current list of Licensed Insurance Companies, Approved Reinsurers, Surplus Lines Insurers and Risk Retention Groups
Issued by the State of Connecticut Insurance Department.

CERTIFICATE OF LIABILITY INSURANCE		DATE (MM/DD/YYYY)	

THIS CERTIFICATE JS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER($), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certlrlcate holder Is an ADDITIONAL INSURED, the policy{les) must be endorse cf. If SUBROGATION IS WAIVED, subject to the tenns and conditions of the policy, certain pollclumay require an endorsement. A statement on thls certificate does not confer rlghts to the certJncate holder In lieu of such endorsement(s).

PROOUCER	MME; PHOIIE E,MAIL AODRESS:	liiiic no1,	
	PRODUCER CUSTOMER ID #:		
	INSURER"" AFFOROING COV!:RAGE		NAIC#
INSURED	ISURERA,		
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	INSURER O:		
	IUSURER E;		
	INSURER F;		

ACORD

WC STATU- TORY LIMI-S | OTH- ER

E.L. DISEASE - EA EMPLOYEE

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

CERTIFICATE HOLDER	CANCELLATION
'	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

ACORD 26 (2009109)

REFERENCES:

Please list at least three (5) school districts in Connecticut or New York of similar size to Greenwich Public Schools where you or your company has performed these services.

1._____

NAME AND ADDRESS TELEPHONE# FAX#

EMAIL

CONTACT PERSON AND TELEPHONE NUMBER

2._____

NAME AND ADDRESS TELEPHONE# FAX#

EMAIL

CONTACT PERSON AND TELEPHONE NUMBER

3._____

NAME AND ADDRESS TELEPHONE# FAX#

EMAIL

CONTACT PERSON AND TELEPHONE NUMBER

4._____

NAME AND ADDRESS TELEPHONE# FAX#

EMAIL

CONTACT PERSON AND TELEPHONE NUMBER

5._____

NAME AND ADDRESS TELEPHONE# FAX#

EMAIL

CONTACT PERSON AND TELEPHONE NUMBER

NON-COLLUSION AFFIDAVIT

State of_____ County of_____:s.s.

GREENWICH PUBLIC SCHOOLS 290 GREENWICH AVE GREENWICH, CONNECTICUT

I state that I am the_____of_____
(TITLE) (NAME OF MY FIRM)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid. I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation communication or agreement with any other contractor, bidder/proposer or potential bidder/proposer.

(2) Neither the price(s) nor the amount of this bid/rfp, and neither the approximate price(s) nor approximate amount of this bid/rfp, have been disclosed to any other firm or person who is a bidder/proposer or potential bidder/proposer, and they will not be disclosed before bid/rfp opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding/proposing on this contract, or to submit a bid/proposal higher than this bid/rfp, or to submit any intentionally high or noncompetitive bid/rfp or other form of complementary bid/rfp.

(4) I fully understand that more than one offer from an individual, firm partnership, corporation or association under the same or different name will be rejected. Reasonable grounds for believing that a bidder/proposer is interested in more than one bid/rfp for the work contemplated may cause rejection of all bids/rfps in which the bidder/proposer is interested. Any or all bidders/proposers will be rejected if there is any reason for believing that collusion exists among the bidders/proposers. Participants in such collusion may not be considered in the future offers for the same work. Each bidder/proposer by submitting a bid/proposal certifies that it is not a part to any collusive action.

(5) The bid/rfp of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid/proposal.

(6) _____its affiliates, subsidiaries, officers,
(NAME OF MY FIRM)

directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding/proposing on any public contract, except as follows:

I state that_____understands and acknowledges that

(NAME OF MY FIRM)
the above representations are material and important, and will be relied on by Greenwich Public Schools in awarding the bid/proposal for which this is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from Greenwich Public Schools of the true facts relating to the submission of bids/proposals for this contract.

(7) I agree to furnish and deliver all services on the date and time agreed on by _____ and the Greenwich Board of Education at
(NAME OF MY FIRM)
The time the purchase order is placed. Furthermore, there will not be any cancellations to the Board of Education. If a bidder/proposer submits a bid/proposer on any item he/she will be responsible for delivering that item at the bid/proposal cost, in accordance with the attached above specifications, which were submitted with this bid/proposal and upon which the bid/proposal was made.

(8) In submitting this bid/proposal, the undersigned declares that this is made without any connection with any persons making another bid/proposal on the same contract; that the bid/proposal is in all respects fair and without collusion, fraud or mental reservation; and that no official of the Town, or any person in the employ of the Town, is directly or indirectly interested in said bid/proposal or in the supplies or work to which it relates, or in any portion of the profits thereof.

(9) In submitting this bid, the undersigned further declares that it has not, and will not, induce or attempt to induce any Town of Greenwich employee or officer to violate the Greenwich Code of Ethics in connection with its offer to provide goods or services under, or otherwise in the performance of such contract.

(10) The undersigned further understands that the above declarations are material representations to the Town of Greenwich made as a condition to the acceptance of the bid/proposal. If found to be false, the Town of Greenwich retains the right to reject said bid/proposal and rescind any resultant contract and/or purchase order and notify the undersigned accordingly, thereby declaring as void said bid/proposal and contract or purchase order.

(11) The Greenwich Code of Ethics can be found at www.greenwichct.org. <http://www.greenwichct.org/> Code of Ethics stated as follows:

1. DEFINITION. (1)Indirect interest, without limiting its generality, shall mean and include the interest of any subcontractor in any prime contract with the Town and the interest of any person or his immediate family in any corporation, firm or partnership which as a direct or indirect interest in any transaction with the Town.
(2) Substantial financial interest shall mean any financial interest, direct or indirect, which is more than nominal and which is not common to the interest of other citizens of the Town. (3) Town Officer shall mean and include any official, commission, committee, legislative body or other agency of the Town. (4) Transaction shall mean and include the offer, sale or furnishing of any real or personal property, material, supplies otherwise, for the use and benefit of the Town for a valuable consideration, excepting the services of any person as a Town Officer.

2. GIFTS AND FAVORS. No Town Officer or his immediate family shall accept any valuable gift, things, favor, loan or promise which might tend to influence the performance or nonperformance of his official duties.

3. IMPROPER INFLUENCE. No Town Officer having a substantial financial interest in any transaction with the Town or in any action to be taken by the Town shall use is office to exert his influence or to vote on such transaction or action.

1. VENDOR INFORMATION. (Please print the following)

VENDOR NAME

ADDRESS

TELEPHONE FAX#

E-MAIL WEB SITE

AUTHORIZED SIGNATURE TITLE

(12) By signing this bid/proposal the bidder/proposer understands and agrees to the attached terms, conditions, and specifications, including Collusion among Bidders/Proposers Employment Discrimination by the Contractor Prohibited.

SIGNATURE

SWORN AND SUBSCRIBED TO BEFORE ME, A NOTARY PUBLIC, IN AND FOR THE COUNTY OF_____AND THE STATE OF

_____THIS _____

DAY OF_____ 2019

MY COMMISSION EXPIRES___ _

NOTARY PUBLIC

COMPANY INFORMATION

NAME OF FIRM STREET CITY, STATE, ZIP

SALES REPRESENTATIVE NAME TELEPHONE# FAX#

FORM OF BID BOND

TOWN OF GREENWICH, CONNECTICUT

Date Bond Executed

BID BOND

Principal

Surety

Penal Sum of Bond (express in words and figures) Date of Bid

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the Town of Greenwich, Connecticut, in the penal sum of the amount stated above, 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 the principal has submitted the accompanying bid, dated as shown above 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 sixty (60) days after said opening, and shall within the period specified therefor, or if no period specified, within ten (10) days after the prescribed forms are presented to him for signature, execute such further contractual documents, if any, as may be required by the terms of the Bid as accepted, and give bonds with good and sufficient surety or sureties as may be required, for the faithful performance and proper fulfillment of the resulting contract, and for the protection of all persons supplying labor and materials in the prosecution of the work provided for in 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 bonds within the time specified, if the principal shall pay the Town of Greenwich, Connecticut, the difference between the amount specified in said bid and the amount for which said Town may procure the required work, supplies, and services, if the latter amount 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-bounden parties have executed this instrument under their several seals on the date indicated above. The name and corporate seal (if applicable) of each corporate party being hereto affixed:

Name of Partnership

_____(SEAL)

Business Address

Partner - (Hereunto Duly Authorized)

IN THE PRESENCE OF:

WITNESS INDIVIDUAL PRINCIPAL

I. AS TO (SEAL)

2. AS TO (SEAL)

3. AS TO (SEAL)

4. AS TO (SEAL)

****

CORPORATE / LLC PRINCIPAL

WITNESS

BUSINESS ADDRESS AFFIX CORPORATE SEAL

TITLE

****

CORPORA TE SURETY

WITNESS BUSINESS ADDRESS AFFIX CORPORATE SEAL

BY - (HEREUNTO DULY AUTHORIZED)

TITLE

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____certify that I am the

_____of the corporation named as principal in the within bond;

that _____, who signed said bond on behalf of the principal, was then___of the

corporation; that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed and attested for and in behalf of said corporation by authority of its governing body.

(Corporate Seal)

PERFORMANCE, MAINTENANCE AND PAYMENT BOND

BOND NO._____ **CONTRACT NO.**_____

KNOW ALL MEN BY THESE PRESENTS. That we._____

_____, as Principal, and

a corporation organized under the laws of the State of_____and authorized to do business in the State of Connecticut as Surety, are holden and firmly bound jointly and severally unto the TOWN OF GREENWICH, CONNECTICUT, hereafter referred to as the Town, a territorial corporation located in the County of Fairfield, in the penal sum of

_____Dollars ($_____

to be paid to it or its certain attorney, successors or assigns, to which payment well and truly to be made, we the said Obligors do bind ourselves, and each of us, our heirs, executors, administrators, and successors firmly by these presents.

IN WITNESS WHEREOF we have hereunto set or caused to be set our respective hands, names and seals this

_____ day of_____ 20

THE CONDITION OF THIS OBLIGATION IS SUCH, That whereas the above named Principal has entered into a certain written contract with the TOWN OF GREENW!CH, CONNECTICUT, dated the_____day of_____2019, for construction of **CONTRACT NO.**_____

_____*(Description of work here - Usually the "name of the bid)* according to the plans and specifications prepared by the TOWN OF GREENWICH, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, if the said Principal shall well and faithfully perform said contract according to its provisions, and fully indemnify and save harmless the Town from all cost and damages which the Town may suffer by reason of failure so to do, and shall pay for all equipment, appurtenances, materials and labor furnished, used or employed in the execution of said contract, and shall indemnify and save harmless the Town from all suits or claims of any nature or description against the Town by reason of any injuries or damages sustained by any person or persons on account of any act or omission of said Principal, his servants or agents, or his subcontractors in the construction of the work or in guarding the work, or on account of the use of faulty or improper materials, or by reason of claims under the Workmen's Compensation Laws or other laws by any employee of the Principal or his subcontractors, or by reason of the use of any patented material, machinery, device, equipment, process, method of construction or design in any way involved in the work, and shall indemnify the Town against such defective workmanship, material and equipment as may be discovered within one (l) year after completion and final acceptance of the work, and shall make good in such defective workmanship and material as may be discovered within said period of one year, then this obligation shall be void, otherwise to remain in full force and effect.

The Surety hereby stipulates and agrees that any modifications, omissions or additions in or to the terms of the aforesaid contract, or in or to the plans or specifications therefor, or any extension of time, shall in no wise affect the obligation of the Surety under this bond, the Surety

hereby waiving any and all right to any notice of any such modifications, omissions, changes, additions or extensions.

CONTRACTOR _____

BY _____

SURETY _____

BY _____

INSURANCE PROCEDURE

PLEASE NOTE:

THIS PAGE MUST BE RETURNED WITH YOUR BID/PROPOSAL. FAILURE TO DO SO MAY RESULT IN YOUR BID/PROPOSAL BEING REJECTED.

Please take the insurance requirements of the Contract to your agent/broker immediately upon receipt of the bid documents to determine your existing coverage and any costs for new or additional coverage required for the work noted in this Request for Bid/Proposal. Any bids/proposals with deficient insurance requirements will be rejected.

STATEMENT OF VENDOR:

I have read the insurance requirements for this work and have taken the documentation to my insurance agent/broker. The bid/proposal cost reflects any additional costs relating to insurance requirements for this work.

Signature Date

Contractor

Insurance Requirements: Before starting and until final completion and acceptance of the work called for in the Contract and expiration of the guarantee period provided for in the Contract, the Contractor and its subcontractors, if any, shall procure and maintain insurance of the types and amounts checked in paragraphs A through F below for all Contract operations.

[x] A. General Liability, with minimum coverages for combined bodily injury and property damage liability of **$2,000,000**
general aggregate, **$1,000,000** per occurrence including:

[x]
[x]
II

1. Commercial General Liability.
2. Town as additional insured.

3. Owners and Contractors Protective Liability (separate policy in the name of the Town).

1. [x] B.

[x] C.

Comprehensive Automobile Liability, with minimum coverages of **$1,000,000** combined single limit for bodily injury and property damage, including, where applicable, coverage for any vehicle, all owned vehicles, scheduled vehicles, hired vehicles, non-owned vehicles and garage liability.

Excess Liability with minimum coverage of **$5,000,000** in umbrella form, or such other form as approved by Town Department Head and Risk Management Director.

[x] D. Workers' Compensation and Employer's Liability, with minimum coverages as provided by Connecticut State Statutes.

[] E.

[] F.

Professional Liability (for design and other professionals for Errors and Omissions) with minimum coverage of **$1,000,000.** If the policy is on a claims-made basis, coverage shall be continually renewed or extended for three (3) years after work is completed under the Contract.

Other (Builder's Risk etc.):._____

[x] G. CERTIFICATE HOLDER: TOWN OF GREENWICH, BOARD OF EDUCATION, ATTN: BOARD OF EDUCATION (also fill in on ACORD Certificate of Insurance) 290 Greenwich Avenue, Greenwich, CT 06830.

The Acord certificate of insurance form must be executed by your insurance agent/broker and returned to this office. Company name and address must conform on all documents including insurance documentation. Il is required that the agent/broker note the individual insurance companies providing coverage, rather than the insurance group, on the Acord form. The Contract number (provided to the awarded Contractor), project name and a brief description must be inserted in the "Description of Operations" field. It must be confirmed on the Acord Form that the Town of Greenwich is endorsed as an additional insured by having the appropriate box checked off and stating such in the "Description of Operations" field. A letter from the awarded vendor's agent/broker certifying that the Town of Greenwich has been endorsed onto the general liability policy as an additional insured is also mandatory. This letter must follow exactly the format provided by the Purchasing Department and must be signed by the same individual authorized representative who signed the Acord form. If the insurance coverage required is provided on more than one Acord certificate of insurance, then additional endorsement letters are also required. Contract development will begin upon receipt of complete, correct insurance documentation.

The Contractor shall be responsible for maintaining the above insurance coverages in force to secure all of the Contractor's obligations under the Contract with an insurance company or companies with an AM Best Rating of B+:VII or better, licensed to write such insurance in Connecticut and acceptable to the Risk Manager, Town of Greenwich. For excess liability only, non admitted insurers are acceptable, provided they are permitted to do business through Connecticut excess line brokers per listing on the current list of Licensed Insurance Companies, Approved Reinsurers, Surplus Lines Insurers and Risk Retention Groups issued by the State of Connecticut Insurance Department.

(SAMPLE ENDORSEMENT LETTER)

AGENT/BROKER
(LETTERHEAD)

(Date)

Eugene H. Watts, Senior Buyer Purchasing
Department
Town of Greenwich/Board of Education
290 Greenwich Avenue - Havemeyer Building Greenwich, CT
06830

Re: Town of Greenwich/Board of Education/ **Contract#**_____

Dear Mr. Watts:

The undersigned hereby certifies as follows:

(1) I am a duly licensed insurance agent under the laws of the State of [insert State] and an authorized representative of all companies affording coverage under the Acord fom1 submitted herewith:

(2) The Town of Greenwich has been endorsed as an additional insured under the general liability policy no. [insert policy number], issued by [insert company affording coverage] to [name of insured];

(3) The general liability policy referenced in paragraph (2) above meets or exceeds the coverage in Commercial General Liability ISO form CG 00 01 10 01, including contractual liability;

(4) The policies listed in the Acord fom1 submitted to the Town of Greenwich in connection with the above referenced contract have been issued to the insured in the amounts stated and for the periods indicated in the Acord form; and

(5) Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Sincerely,

Authorized Representative for all companies listed in the Acord form

A. M. BEST KEY RATING GUIDE FORM

The_____is licensed in

The State of Connecticut as per listing in the 2019 edition of the

A.M. Best Key Rating Guide for Property and Casualty, page Number ____

--

Theirratingis_____

The Bidder is required to do Employee Background Checks as imposed by Section 2 of Public Act 16-67, which amended Conn. Gen. Stat. 10-222c.

NAME OF BIDDER:

_____

SECTION 00 41 13 - BID FORM

NAME AND ADDRESS OF BIDDER:

[Name]

[Company]
[Address]
[City, State Zip]

The undersigned, having familiarized ( ) him/herself ( ) themselves with the local conditions effecting the cost of the work, and with the Bidding Documents (including Invitation to Bid, Instructions to Bidders, Supplemental Instructions to Bidders, and this Bid Form), the Contract Documents (including Owner-Contractor Agreement, Performance Bond and Payment Bond, the General Conditions of the Contract for Construction, and the Supplementary Conditions), the General Requirements (Division 1 Specifications), other technical specifications (Divisions 2 through 33), the Drawings, and Addenda, if any thereto), as furnished by Milone & MacBroom, Inc., hereby propose to construct and complete the work proposed for the **Hamilton Avenue School Natural Grass Field Reconstruction**, all in accordance therewith for the lump sum listed below.

SECTION I – LUMP SUM BID

TOTAL LUMP SUM BID:
(Consisting of all work necessary to complete this project)

_____ ($_____)
Written Figure Dollars & Cents

SECTION II – BASE BID BREAKDOWN

Give the total lump sum for each line item listed below, consisting of all work as described in the specifications and as shown on the Drawings, and as necessary to complete the total work related to each line item. Identify subcontractor and an alternate subcontractor as indicated. If work is to be self-performed, it is not necessary to identify an alternate.

1. General Requirements (Max. 10% of Total Lump Sum)

_____ ($_____)
Written Figure Dollars & Cents

2. Site Clearing &
Sediment and Erosion Controls

_____ ($_____)
Written Figure Dollars & Cents

3. Earth Moving

_____ ($_____)
Written Figure Dollars & Cents

4. Asphalt Paving

_____ ($_____)
Written Figure

5. Masonry Wall

_____ ($_____)
Written Figure Dollars & Cents

6. Skinned Infield

_____ ($_____)
Written Figure Dollars & Cents

7. Chain Link Fence Backstop

_____ ($_____)
Written Figure Dollars & Cents

8. Planting

_____ ($_____)
Written Figure Dollars & Cents

9. Turf and Grasses

_____ ($_____)
Written Figure Dollars & Cents

10. Storm Drainage

_____ ($_____)
Written Figure Dollars & Cents

TOTAL

_____ **($_____)**
Written Figure **Dollars & Cents**

(The total above shall be the same figure entered for Lump Sum Bid in Section I of this Bid Form).

SECTION III – ALTERNATES:

Alternate 1: Add Expanded Play Area

_____ ($_____)
Written Figure Dollars & Cents

Alternate 2: Add Full Skinned Infield

_____ ($_____)
Written Figure Dollars & Cents

Alternate 3: Recreational Court Surfacing

_____ ($_____)
Written Figure Dollars & Cents

SECTION IV – UNIT PRICES

Unit Price 1: Rock Removal - Trench
(Assume 100 Cubic Yards)

_____ ($_____)
Written Figure (Per Cubic Yard) Dollars & Cents (Per Cubic Yard)

SECTION V – TIME OF COMPLETION

If awarded this Contract, the Undersigned guarantees Substantial Completion of Contract within 75 calendar days of Notice to Proceed; and guarantees Final Completion (including all punch list items) within 90 calendar days.

SECTION VI – ADDENDUM RECEIPT

Receipt of the following Addenda to the Contract Documents is acknowledged:

Addendum Number: _____

Dated: _____

Addendum Number: _____

Dated: _____

SECTION VII – BID ACCEPTANCE

1. In submitting this bid, it is understood that the right is reserved by the City to reject any and all bids and to waive any informalities or irregularities in the bid received and to accept the bid deemed to be in its best interest. If written notice of the acceptance of this bid is mailed, faxed, or delivered to the undersigned within sixty (60) days after the opening thereof, the undersigned agrees to execute and deliver a contract in the prescribed form and furnish the required bonds within ten (10) days after the contract is presented to him/her for signature.

2. A Bid Bond is required.

3. Attached hereto is an affidavit in proof that the undersigned has not entered into any collusion with any person in respect to this proposal or any other proposal or the submitting of proposals for the contract for which this proposal is submitted.

4. The Owner further reserves the right to reject any bid or all bids, to waive any informalities or irregularities in the bid received and to accept the bid, which in his/her judgment will be in the best interest of the City

NAME OF BIDDER:

_____

OFFICIAL ADDRESS:

Date: _____

By: _____

Title: _____

END OF SECTION

INTRODUCTION TO THE TECHNICAL SPECIFICATIONS

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

Within the Technical Specifications 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 Coditions, Special Conditions, Technical Specifications, Standard Specifications, Supplemental Specifications, Appendix.

2. **Standard Specifications**: The State of Connecticut, Department of Transportation, "Specifications for Roads, Bridges, Facilities and Incidental Construction," Form 817, Dated 2016, (otherwise referred to collectively as the Standard Specifications) is hereby made part of this contract, as modified by these Technical Specifications. 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 Technical Specifications. The Technical Specifications 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	The Town of Greenwich acting directly or through a duly authorized representative.
Inspector	The Town of Greenwich 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 Greenwich.

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)**: 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 Technical Specifications, 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. Technical Specifications;
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.

END OF SECTION

SECTION 01 10 00 – GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. PROJECT IDENTIFICATION: Hamilton Avenue Field Natural Grass Reconstruction, 184 Hamilton Avenue, Greenwich Connecticut.

B. OWNERS REPRESENTATIVE: The project engineer and landscape architect is Milone & MacBroom, Inc. or his/their accredited representative, and is referred to in the Contract Documents as "Engineer" or "Landscape Architect" or by pronouns which imply them. As information for the Contractor, the Engineer's status is defined as follows:

1. As the authorized representative the Engineer is responsible for review of Shop Drawings, materials and equipment intended for the work, in accordance with the "General Conditions" and the "Supplementary General Conditions".

C. PROJECT SUMMARY: This Project is the reconstruction of a natural grass athletic field, construction of a bituminous concrete play area (Bid Alternate No.1), bituminous concrete walks, landscaping, and miscellaneous site improvements.

D. PERMITS AND FEES: Apply for, obtain, and pay for permits, fees, and utility company charges required to perform the work. Submit copies to Owner.

E. STANDARDS, CODES AND SPECIFICATIONS:

1. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
2. References to standard specifications and codes refer to the editions current at the bid due date. An exception is, buildings exceeding the threshold limit must be in substantial compliance with the requirements of the effective code at the time of receipt of completed application to the State Building Inspector (SBI). References include their addenda and errata, if any, and shall be considered a part of these specifications as if they were printed herein in full.
3. The manufacturers' standard warranties or guarantees shall apply when their products are used on this project.
4. Whenever miscellaneous items or work are not covered by these specifications, they shall be governed by the applicable provisions of these Supplementary General Conditions.

F. PROJECT DOCUMENTS

1. The Specifications and the Drawings describe and illustrate the materials and labor necessary for the work of this Project. Do not scale drawings.
2. The General Conditions and Supplementary General Conditions apply to each Section of the Specification.

G. DIMENSIONS: Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.

H. EXISTING CONDITIONS: Notify Engineer of existing conditions differing from those indicated on the drawings. Do not remove or alter structural components without prior written approval.

I. COORDINATION:

1. Coordinate the work of the several trades to assure the efficient and orderly sequence of installation of construction elements.
2. Prepare coordination drawings for areas above ceilings where close tolerances are required between building elements and mechanical and electrical work.
3. Verify that characteristics of interrelated equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting and placing equipment in service.
4. Verify location of utilities and existing conditions.

J. INSTALLATION REQUIREMENTS, GENERAL:

1. Inspect substrates and report unsatisfactory conditions in writing.
2. Do not proceed until unsatisfactory conditions have been corrected.
3. Take field measurements prior to fabrication where practical. Form to required shapes and sizes with true edges, lines and angles. Provide inserts and templates as needed for work of other trades.
4. Install materials in exact accordance with manufacturer's instructions and approved submittals.
5. Install materials in proper relation with adjacent construction and with proper appearance.
6. Restore units damaged during installation. Replace units which cannot be restored at no additional expense to the Owner.
7. Refer to additional installation requirements and tolerances specified under individual specification sections.

K. CONTRACTOR'S USE OF PREMISES

1. The Contractor shall confine his operations, including storage of apparatus, equipment and materials to the contract limit lines as directed by the Owner or his Representative.
2. The areas and/or spaces, including their access, shall be maintained free and clear throughout the contract term.
3. It is expected that all work areas will be cleaned up daily.

L. DEFINITIONS:

1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.
2. Match Existing: Match existing as acceptable to the Owner.

M. INTENT:

1. Drawings and specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth but which is reasonable implied or necessary for proper performance of the project shall be included.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Identification and description of Alternate Work.

1.2 DESCRIPTION OF REQUIREMENTS

A. "Alternates" are defined as alternate products, materials, equipment, systems, methods, units of work or major elements of the construction, which may, at Owner's option, and under terms established by Instructions to Bidders and in the Contract or Agreement, be selected for the Work in lieu of corresponding requirements of Contract Documents. Alternates may or may not change the scope and general character of the Work substantially. Requirements of this section may be related to "allowances," "unit prices," "change orders," "substitutions," and similar provisions.

B. Refer to the Contract or "Owner-Contractor Agreement," and subsequent modifications thereof, if any, for determination of which of the several scheduled "Alternates" herein have been accepted, and therefore are in full force and effect as though included originally in the contract documents of the base bid.

C. Coordinate related work and modify surrounding work as required to complete the Work, including changes under each alternate, when acceptance is designated in the Owner-Contractor Agreement.

D. Immediately following award of Contract, prepare and distribute to each entity to be involved in performance of the Work, a notification of status of each alternate. Indicate which Alternates have been:

1. Accepted
2. Rejected
3. Deferred for consideration at a later date as indicated. Include full description of modifications to alternates, if any.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS OF ALTERNATES

A. Description for each Alternate is recognized to be abbreviated and incomplete. Each change in execution must be complete for the scope of Work affected. Refer to the Specification Sections and Drawings, for specific requirements of the Work, regardless of whether references are so noted in description of each alternate. Coordinate related work and modify surrounding work as required to properly integrate with the Work of each alternate. It is recognized that descriptions of alternates are primarily scope

definitions, and do not necessarily detail full range of materials and processes needed to complete the work as required.

2.2 DESCRIPTION OF ALTERNATES

A. **Alternate Number 1: Eliminate Expanded Play Area**
Additional cost or deduct cost and schedule impact, if any, to install the expanded paved play area and associated underground storm drainage infiltration system in lieu of lawn.

B. **Alternate Number 2: Add Full Skinned Infield**
Additional cost or deduct cost and schedule impact, if any, to install a full skinned youth ball field in lieu of just the batters/home plate circle and lawn.

C. **Alternate Number 3: Recreational Court Surfacing**
Additional cost or deduct cost and schedule impact, if any, to install a recreational court surfacing on the expanded play area and existing basketball court, as well as re-striping the existing basketball court.

PART 3 - EXECUTION

(Not Used)

END OF SECTION 01 23 00

SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections:

1. Division 01 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Engineer will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710.

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
2. Within 20 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include costs of labor and supervision directly attributable to the change.
d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
e. Quotation Form: Use forms acceptable to Engineer.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Engineer.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Unit Price Adjustment: Refer to Division 01 Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit price work, if applicable.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Engineer will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Change Directive: Engineer may issue a Construction Change Directive on AIA Document G714 Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 30 00 – ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Administration of Contract: Provide administrative requirements for the proper coordination and completion of work including the following:

1. Supervisory personnel.
2. Preconstruction conference.
3. Project meetings, minimum of two per month; prepare and distribute minutes. A schedule of regular project meetings will be established, once contract has been awarded.

B. Reports: Submit daily and special reports.

C. Work Schedule: Submit progress schedule, updated monthly.

D. Schedule of Values: Submit schedule of values.

E. Perform Surveys: Lay out the work and verifying locations during construction. Perform final site survey.

F. Emergency Contacts: Submit and post a list of emergency telephone numbers and address for individuals to be contacted in case of emergency.

G. Record Documents: Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.

1.2 PROJECT PHOTOGRAPHS

A. General Contractor shall photograph project weekly documenting key construction components. They shall be distributed to owner's representatives and Engineer monthly. Photographs shall show progress of work, identify area in photo and each photo shall indicate date photographed.

B. On the date the work is begun and on or about the first day of each month thereafter (until the work is at least 95 percent completed), the Contractor shall take photographs of the construction.

C. Take a minimum of (24) photo in digital format each month. Deliver pictures to the Owners representative & Engineer at the end of each month.

1.3 SCHEDULES AND REPORTS

A. Contractor shall provide close administrative and procedural coordination of scheduling and reporting requests with those of other Contractors. Contractor shall be responsive to overall coordination responsibilities of the Project. Maintain coordination and correlation

between separate reports by updating at a monthly or bi-weekly time intervals.

B. Contractor shall submit a Bar-Chart Schedule not more than seven days after the Date of Notice to Proceed. On the schedule, indicate a time bar for each major category of work to be performed at site, properly sequenced and coordinated with other elements of the work. Show completion of the work sufficiently in advance of the date of substantial completion of the work. The Bar-Chart shall be updated monthly.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made a part of this section of the specifications.

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on the Project including, but not limited to, the following:

1. General project coordination procedures.
2. Coordination Drawings.
3. Administrative and supervisory personnel.
4. Project meetings.
5. Contractor List.
6. Punch List Requirements.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section 01 77 00 "Closeout Procedures" for coordinating Contract closeout.

1.3 COORDINATION

A. Coordination: The Contractor shall coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

B. The Contractor shall be solely responsible for site safety and all construction means, methods, techniques, sequences, and procedures for coordinating all portions of the work under the Contract.

C. The Contractor shall carefully check his own work and that of the Subcontractors as the work is being performed. Unsatisfactory work shall be corrected immediately.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

D. When necessary, the Contractor shall prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

E. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Change order requests.
8. Project closeout activities.

F. If the Contractor fails to substantially complete the project by the completion date required by the Contract Documents and as modified by any change orders, the Contractor shall pay liquidated damages, amount as specified in the General Conditions, for each calendar day beyond the contract completion date.

1.4 COORDINATION DRAWINGS

A. Coordination Drawings: The Contractor shall prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Indicate relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. Coordination Drawings shall show the size and location of mechanical pipes, ducts, equipment and appurtenances, relative to the work of other trades shall be prepared before materials are purchased or work is begun. Preparation of coordination of coordination drawings is the responsibility of the contractor for use by the contractor and subcontractors. Coordination drawings must be approved before proceeding with the work.
4. All coordination drawings are to be produced using CADD software compatible with AutoCAD Release 2014.

B. Staff Names: Within 15 days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and

telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. The Contractor shall provide an experienced and responsible licensed project Superintendent. The Superintendent shall be designated by the Contractor as his/her representative and to be in full time attendance at the project site throughout the prosecution and progress of the work.

B. The Contractor shall provide the job Superintendent with a phone or other means as required allowing for communication with the Owner and the Engineer.

C. In addition to the Project Superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1. Include special personnel required for coordination of operations with other subcontractors.

1.6 PROJECT MEETINGS

A. General: Meetings will be held at the Project site, unless otherwise indicated.

1. Attendees: Participants and others involved, and individuals whose presence is required.
2. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned.

B. Preconstruction Conference: A pre-construction conference shall be scheduled and chaired by the Owner before starting construction, the conference shall be held at the Project site or another convenient location. The purpose of the meeting is to review responsibilities and personnel assignments.

1. Attendees: Owner and their Engineer; Contractor and his/her Superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing.
d. Designation of responsible personnel. The Contractor shall identify a contractor safety representative to interface with the Owner. This person may also fill other roles within the contractor's project area e.g. project manager, superintendent, foreman, etc.
e. Procedures for processing field decisions and Change Orders.
f. Procedures for processing Applications for Payment.
g. Distribution of the Contract Documents.
h. Submittal procedures.

i. Preparation of Record Documents.
j. Use of the premises.
k. Safety. The Contractor Safety Representative is responsible to ensuring information is disseminated to all contractor/ subcontractor employees
l. Responsibility for temporary facilities and controls.
m. Parking and construction limits.
n. Office, work, and storage areas.
o. Equipment deliveries and priorities.
p. First aid.
q. Security.
r. Progress cleaning.
s. Working hours.
t. Emergency phone numbers.
u. Payment procedures and Schedule of Values.
v. Material deliveries.

3. Reporting: Minutes of the meeting shall be prepared by the Engineer or designated representative and shall be distributed to each party present. The Contractor shall be responsible for distributing the minutes to all Filed-Sub Contractors.

C. Pre-installation Conferences: The Contractor shall conduct a pre-installation conference at the Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise everyone concerned with scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related Change Orders.
d. Purchases.
e. Deliveries.
f. Submittals.
g. Review of mockups.
h. Possible conflicts.
i. Compatibility problems.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's written recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities and controls.
q. Space and access limitations.

r. Regulations of authorities having jurisdiction.
s. Testing and inspecting requirements.
t. Required performance results.
u. Protection of construction and personnel.
v. Manpower
w. The Contractor shall record significant conference discussions, agreements, and disagreements. Distribute the meeting minutes to everyone concerned, within 3 (three) days of the meeting.

3. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Progress meetings shall be held at weekly intervals.

1. Attendees: In addition to the Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Manpower.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Change Orders.
14) Documentation of information for payment requests.

3. Reporting: Project meetings will be chaired by the Engineer. Minutes of the project meetings shall be prepared by the Engineer or designated representative and shall be distributed to each party present. The Contractor shall be responsible for distributing the minutes to all Filed-Sub Contractors.

    a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

E. Coordination Meetings: Conduct Project coordination meetings at intervals as determined by the Contractor or when requested by the Owner of Engineer. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.

F. Attendees: In addition to the Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work

1. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    c. Review present and future needs of each contractor present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site utilization.
        8) Temporary facilities and controls.
        9) Manpower.
        10) Hazards and risks.
        11) Progress cleaning.

12) Quality and work standards.
13) Change Orders.

2. Reporting: The Contractor shall record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.7 CONTRACTOR AND SUBCONTRACTOR LIST:

A. At the pre-construction meeting the Contractor shall provide to the Owner and Engineer a list containing the following:

1. Contractors name, address, phone number, fax number, e-mail address and after hours emergency phone number.
2. Contractors Superintendent name and cell phone number.
3. Each Sub-Contractors name, address, phone number, fax number and description of the products or services they will provide to the project.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made a part of this section of the specifications.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Field condition reports.
5. Special reports.

B. Related Sections include the following:

1. Section 01 29 00 "Payment Procedures" for submitting the Schedule of Values.
2. Section 01 31 00 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
3. Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor activity is an activity that must be completed before a given activity can be started.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

F. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

G. Major Area: A story of construction, a separate building, or a similar significant construction element.

H. Milestone: A key or critical point in time for reference or measurement.

I. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

1.4 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article and in-house scheduling personnel to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Designers and owners, and other information specified.

B. Submittals Schedule: Submit four copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Engineer's final release or approval.

C. Preliminary Construction Schedule: Submit four printed copies; one a single sheet of reproducible media, and one print.

D. Contractor's Construction Schedule: Submit four printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.

E. Field Condition Reports: Submit 4 copies at time of discovery of differing conditions.

F. Special Reports: Submit 4 copies at time of unusual event.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting.

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in 1 Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, interim milestones and partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review time required for review of submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for completion and startup procedures.
9. Review and finalize list of construction activities to be included in schedule.
10. Review submittal requirements and procedures.
11. Review procedures for updating schedule.

C. Schedule approval by Filed Sub-bidders: Schedules, work diagrams or other progress documentation produced by the Contractor, which includes documentation of the work of Filed Sub-Bidders, shall be noted and approved by the effected Filed Sub Bidders.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit initial schedule at Preconstruction Conference. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit final submittal schedule at first regularly scheduled progress meeting after the start of construction operations o. concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work or the Notice to Proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Engineer.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

a. Sod turf system

3. Submittal Review Time: Include review and resubmittal times. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than 14 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.

3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date. Delivery dates indicated stipulate the earliest possible delivery date.
5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
6. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use of premises restrictions.
    f. Provisions for future construction.
    g. Seasonal variations.
    h. Environmental control.

7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

    a. Subcontract awards.
    b. Submittals.
    c. Purchases.
    d. Mockups.
    e. Fabrication.
    f. Sample testing.
    g. Deliveries.
    h. Installation.
    i. Tests and inspections.
    j. Adjusting.
    k. Curing.
    l. Startup and placement into final use and operation.

8. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

    a. Structural completion.
    b. Permanent space enclosure.
    c. Completion of mechanical installation.
    d. Completion of electrical installation.
    e. Substantial Completion.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, interim milestones indicated below, Substantial Completion, and Final Completion.

E. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

F. Contract Modifications: Refer to Section 01 26 00 – Contract Modification Procedures.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule at the Preconstruction conference.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for the duration of construction.

2.4 REPORTS

A. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, and response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at last regularly scheduled progress meeting of the month.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made a part of this section of the specifications.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Related Sections include the following:

1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment.
2. Section 01 31 00 "Project Management and Coordination" for submitting Coordination Drawings.
3. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 1 Section 01 40 00 "Quality Requirements" for submitting test and inspection reports and Delegated-Design Submittals and for erecting mockups.
5. Section 01 77 00 "Closeout Procedures" for submitting warranties, Project Record Documents and operation and maintenance manuals.
6. Section 01 77 00 "Closeout Procedures" for submitting Record Drawings, Record Specifications, and Record Product Data.
7. Section 01 77 00 "Closeout Procedures" for operation and maintenance manual requirements.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Engineer's responsive action.

B. Informational Submittals: Written information that does not require Engineer's approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received. This includes coordination of samples, material colors & samples.

B. Submittals Schedule: Comply with requirements in Section 01 32 00 "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal.

1. Initial Review: Allow 15 calendar days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Concurrent Review: Where concurrent review of submittals by Engineer's consultants, Owner, or other parties is required, allow 15 calendar days for initial review of each submittal.
3. Direct Transmittal to Consultant: Where the Contract Documents indicate that submittals may be transmitted directly to Engineer's consultants, provide duplicate copy of transmittal to Engineer. Submittal will be returned to Engineer before being returned to Contractor.
4. If intermediate submittal is necessary, process it in same manner as initial submittal.
5. Allow 15 calendar days for processing each resubmittal.
6. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Engineer.
    d. Name and address of Contractor.
    e. Name and address of subcontractor.
    f. Name and address of supplier.
    g. Name of manufacturer.
    h. Unique identifier, including revision number.
    i. Number and title of appropriate Specification Section.
    j. Drawing number and detail references, as appropriate.
    k. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will discard submittals received from sources other than Contractor.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
3. Transmittal Form: Provide locations on form for the following information:

    a. Project name.
    b. Date.
    c. Destination (To:).
    d. Source (From:).
    e. Names of subcontractor, manufacturer, and supplier.
    f. Category and type of submittal.
    g. Submittal purpose and description.
    h. Submittal and transmittal distribution record.
    i. Remarks.

H. Signature of transmitter.

I. Distribution: Furnish copies of final submittals to Project Managers, Engineer, Engineer and their consultants, manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

K. The Contractor shall provide an electric copy of all approved submittals used throughout the project. The electronic file shall be in PDF format and shall be submitted with the closeout documentation.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Shop drawings, reviewed and annotated by the Contractor - 4 copies or 1 copy and 1 electronic copy
2. Product data - 4 copies or 1 copy and 1 electronic copy
3. Samples -3, plus extra samples as required indicating range of color, finish, and texture to be expected.
4. Inspection and test reports or 1 copy and 1 electronic copy.
5. Warranties - 2 copies.
6. Survey data - 2 copies & 1 electronic copy.
7. Closeout submittals - 2 copies & 1 electronic copy.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.
i. Mill reports.
j. Standard product operating and maintenance manuals.
k. Compliance with recognized trade association standards.
l. Compliance with recognized testing agency standards.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.

e. Shopwork manufacturing instructions.
f. Templates and patterns.
g. Schedules.
h. Design calculations.
i. Compliance with specified standards.
j. Notation of coordination requirements.
k. Notation of dimensions established by field measurement.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
3. Number of Copies: Submit copies of each submittal, as follows:

a. Initial Submittal: Submit one
b. Final Submittal: Submit one

D. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Section 01 40 00 "Quality Requirements" for mockups.
2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Engineer's sample where so indicated. Attach label on unexposed side that includes the following:

a. Generic description of Sample.
b. Product name or name of manufacturer.
c. Sample source.
d. Project name.

5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:

a. Size limitations.
b. Compliance with recognized standards.
c. Availability.
d. Delivery time.

6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.

    a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
    b. Refer to individual Specification Sections for requirements for Samples that illustrate quality of work, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

7. Number of Samples for Initial Selection: Submit one full set[s] of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
8. Number of Samples for Verification: Submit three sets of Samples.

    a. Submit a single Sample where assembly details, quality of work, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

9. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

E. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

    1. Type of product. Include unique identifier for each product.
    2. Number and name of room or space.
    3. Location within room or space.

F. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

    1. Name, address, and telephone number of entity performing subcontract or supplying products.
    2. Number and title of related Specification Section(s) covered by subcontract.
    3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit one copy of each submittal, unless otherwise indicated. Engineer will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Section 01 40 00 "Quality Requirements."

B. Contractor's Construction Schedule: Comply with requirements in Section 01 32 00 "Construction Progress Documentation."

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

J. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

K. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

L. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

M. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

O. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Section 01 77 00 "Closeout Procedures."

P. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

R. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

S. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

T. Material Safety Data Sheets: Submit information to Engineer.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

C. Informational Submittals: Engineer will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION

SECTION 01 40 00 – QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made a part of this section of the specifications

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:

1. Divisions 2 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents,

provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

1.5 REGULATORY REQUIREMENTS

A. Copies of Regulations: Obtain copies of the following regulations and retain at Project site to be available for reference by parties who have a reasonable need:

1. Connecticut State Building Code.

1.6 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by a registered Commonwealth of Massachusetts design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

D. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.

10. Ambient conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

E. Permits, Licenses, and Certificates: For the Owners records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State of Connecticut and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

H. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.

1. Contractor responsibilities include the following:

a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
d. When testing is complete, remove assemblies; do not reuse materials on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.8 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with name, address, and telephone number of testing agency engaged by the Owner and a description of the types of testing and inspecting they are engaged to perform.
2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 72 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Engineer with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and re-inspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Engineer, Owner, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Engineer, Owner, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.

1. Distribution: Distribute schedule to Owner, Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
2. Comply with the Contract Document requirements for Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made a part of this section of the specifications.

1.2 REQUIREMENTS: include but are not limited to the following:

A. Hoisting Equipment and Machinery

B. Maintenance of Access

C. Construction Equipment

D. Dust Control

E. Noise Control

F. Site Enclosure Fence

G. Field Offices

H. Temporary Sanitary Facilities

I. Temporary Electricity and Lighting

J. Temporary Water

K. Telephone

L. Delivery of Materials

M. Shut down Notice

N. Barricades, Warning Signs and Lights

O. Traffic Ways

P. Excavations and Field Survey Requirements

Q. Cleaning during Construction

R. Transportation and Handling

1.3 HOISTING EQUIPMENT AND MACHINERY

A. All hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the work shall be furnished, installed, operated and maintained in safe condition by the Contractor for the use of all Subcontractors material and/or equipment delivered to the designated hoisting area except that which is specifically required to be provided by the Subcontractors themselves and is so stated in each appropriately related Section of the Specifications. All costs for hoisting operation services shall be borne by the Contractor unless specifically excepted in the Contract Documents.

1.4 CONSTRUCTION EQUIPMENT

A. The Contractor shall furnish and maintain all equipment such as scaffolding, ladders, ramps, chutes, etc., as required for the proper execution of the work, unless specifically included under the work of other trades.

B. All such apparatus, equipment and construction shall meet all requirements of the Labor Law and other State and Local Laws applicable thereto.

1.5 DUST CONTROL

A. The Contractor shall provide adequate means for the purpose of preventing dust caused by construction operations throughout the period of the construction contract. The Contractor shall clean all surfaces that, in the opinion of the Engineer or Project Manager, have become contaminated with dust due to construction operations.

B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions set forth in the contract articles with added regard to performance obligations of the Contractor.

1.6 NOISE CONTROL

A. Work must be scheduled and performed in such a manner as to not interfere the operations of adjacent properties. Construction work that is deemed by the Owner to be excessively noisy may be required to be done during non-normal working hours and at no additional expense to the Owner.

B. Develop and maintain a noise abatement program and enforce strict discipline over all personnel to keep noise to a minimum.

C. Execute construction work by methods and by use of equipment which will reduce excess noise.

1. Manage vehicular traffic and scheduling to reduce noise.

1.7 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide suitable, single occupant toilet units of the chemical type. Provide units properly vented and fully enclosed with a polyester or similar non-absorbent

shell. Locate toilet units within project construction fence or provide similar protection to deter vandalism.

1.8 TEMPORARY ELECTRICITY AND LIGHTING

A. Power and lighting may be taken from the power company's nearest pole with temporary poles, if needed, to extend the line to project. If permanent power lines have been installed before beginning project, then temporary lines can be brought in from the last pole. Upon completion of the project, remove temporary lines.

B. Provide service required for construction with branch wiring and distribution boxes located to provide power and lighting by construction-type extension cords. Provide service to and connect general contractor's and owner's field offices.

C. All costs of temporary power and lighting shall be paid by the Contractor.

1.9 TEMPORARY WATER

A. Water for construction purposes may be taken from the existing service. The Contractor shall provide connections, meter and pipe to the water main or nearest hydrant, subject to the approval of the Owner. Upon completion of work, the Contractor shall remove the temporary connections and back fill if necessary. If new water service is installed before construction is complete, the new system may be used provided it is returned to the Owner in as-new condition. The Contractor shall pay for water used, as metered.

1.10 DELIVERY OF MATERIALS

A. All Materials shall be delivered to the Contractor's or Sub-Contractor's property if the Contractor's representative is not present at the project site to receive them.

1.11 SHUT DOWN NOTICE

A. The Contractor shall notify the Owner at least seven (7) working days in advance, of the need to shut down or modify any utilities. If, due to emergencies or staffing shortages, personnel are unable to provide the required shut down or modifications, the contractor shall reschedule their work at no cost to the Owner.

1.12 BARRICADES, WARNING SIGNS, AND LIGHTS

A. Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and public of possible hazards. Where appropriate and needed, provide lighting including flashing red and amber lights.

1.13 TRAFFIC WAYS

A. The Contractor may use on site paved roads and parking areas. Public rights-of-way shall not be blocked by standing trucks, parked cars, material storage, construction operations or in any other manner unless previously approved in writing by the owner.

B. Contractor is to make arrangements to use flagmen to maintain traffic flow. Costs to be paid for by the Contractor.

C. Public roads and existing paved roads, drives and parking areas on Owner's property shall be kept free from scrap or debris due to construction operations and any damage to their surface caused by the Contractor shall be repaired by the contractor at their own expense.

D. If the Work of the Contract affects public use of any street, road, highway or thoroughfare, the contractor shall confer with the police authority having jurisdiction to determine if and how many police are needed for public safety, in addition to any barriers and signals that may be needed. The Contractor will be responsible for payment of any needed police services.

1.14 CLEANING DURING CONSTRUCTION

A. Unless otherwise specified under the various trade Sections of the Specifications, the Contractor shall perform clean-up operations during construction as herein specified,

B. Control accumulation of waste materials and rubbish; periodically dispose of off site, The Contractor shall bear all costs, including fees resulting from such disposal.

C. Maintain project in accordance with all local, State and Federal Regulatory Requirements,

D. Store volatile wastes in covered metal containers, and remove from premises.

E. Prevent accumulation of wastes which create hazardous conditions.

F. Provide adequate ventilation during use of volatile or noxious substances.

G. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on site.
2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
3. Do not dispose of wastes into streams or waterways.

H. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

I. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned.

J. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and windblown debris, resulting from construction operations.

K. Provide on-site containers for collection of waste materials, debris, recycling and rubbish. All contains are to be covered.

L. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas off the construction site.

M. Handle material in a controlled manner with as few handlings as possible, do not drop or throw materials from heights.

N. Schedule cleaning operations so that dust and other contaminants resulting from cleaning will process will not damage surrounding surfaces.

1.15 TRANSPORTATION AND HANDLING

A. Materials and equipment shall be delivered, stored and handled to prevent intrusion of foreign matter and damage by weather or breakage. Packaged materials shall be delivered and stored in original, unbroken packages.

B. All materials must be stored within the Contract Limit Lines.

C. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct and products are undamaged.

D. Packages, materials and equipment showing evidence of damage will be rejected and replaced at no additional cost to the Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Manufacturers: Provide products from one manufacturer for each type or kind as applicable.

B. Product Selection: Provide products selected and reviewed by Engineer.

C. Products submitted for substitution shall be submitted with complete documentation, and include construction costs of substitution including related work.

D. Substitutions: Request for substitution must be in writing. Conditions for substitution include:

1. Specified material cannot be coordinated with other work.
2. Specified material is not acceptable to authorities having jurisdiction.
3. Substantial advantage is offered to the Owner in terms of cost, time, or other valuable consideration.

E. Substitution Requests: Substitutions shall be submitted prior to award of contract, unless otherwise acceptable. Approval of shop drawings, product data, or samples containing substitutions is not an approval of a substitution.

F. Store products in accordance with manufacturer's instructions with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity range required by manufacturer.

G. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

H. Store loose granular material on solid surfaces in a well-drained area; prevent mixing with foreign matter.

I. Arrange storage to provide access for inspection. Periodically inspect to insure products are undamaged and are maintained under required conditions. Keep log showing date, time and problems, if any.

J. Stone, masonry units and similar materials shall be stored on platforms or dry skids and shall be adequately covered and protected against damage.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 77 00 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made a part of this section of the specifications.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project record documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Landscape repairs.

B. Related Sections include the following:

1. Divisions 2 through 33 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Submit specific warranties, maintenance service agreements, final certifications, and similar documents.
3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include signed Certificate of Inspection for Use and Occupancy from the Department of Public Safety, operating certificates, and similar releases.
4. Prepare and submit Project Record Documents, operation and maintenance manuals, construction photos, damage or settlement surveys, property surveys, and similar final record information.
5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
6. Submit test/adjust/balance records.
7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
8. Complete final cleaning requirements.
9. Touch up and otherwise repair and restore marred exposed finishes to eliminate any visual defects.

10. Perform Landscape Repairs.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer, or Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Use/Occupancy after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued. The time frame for the completion of the "punch list items" shall not exceed the completion date of the contract. Should the "punch list items" not be completed within the specified time frame, the Owner may invoke the rights provided under the General Conditions.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment.
2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by the Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Written certification that installed equipment and systems have been tested in the presence of the Engineer and are operational and satisfactory.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer or Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit four copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.

2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Engineer.
    d. Name of Contractor.
    e. Page number.

1.6 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Owner, and Engineer reference during normal working hours.

B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

    1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

        a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
        b. Accurately record information in an understandable drawing technique.
        c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
        d. Mark Contract Drawings completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.

    2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
    3. Mark important additional information that was either shown schematically or omitted from original Drawings.
    4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
    5. Contractor shall sign each drawing to certify the as-built conditions. Also, sub-contractors shall sign sheets for work they performed.
    6. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Submit an electronic copy of all final and approved as-built drawings on a CD PDF format.

D. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where

installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders, Record Drawings, and Product Data, where applicable.

E. Submit an electronic copy of all final Record specification, addenda, and modifications on a CD in a PDF format.

F. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Drawings, and Record Specifications, where applicable.
4. Submit the final approved Record Product Data on a CD in PDF format.

G. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference. Submit the final and approved Miscellaneous Record Submittals on a CD in PDF format.

1.7 As-Built Drawings

A. Provide As-Built Drawings depicting all installed improvements including:

1. Contours at 2 foot intervals indicating finished grade
2. All site utilities showing all pipe sizes, slopes, inverts and top of frames
3. Parking areas
4. Athletic fields and courts
5. Buildings
6. Fencing
7. Lighting
8. Landscaping and any restored areas

B. As-Built drawings shall be prepared and stamped by a Connecticut licensed surveyor.

C. As-Built Drawings shall be reviewed and certified by a registered professional engineer that the completed project meets the approved design plans.

D. Reference shall be made on the as-built drawings to the Middletown Inland Wetlands & Watercourses Agency Permit to give notice to property owners that permits are required in order to work on this site.

E. Provide 3 paper copies signed and sealed as required for the Owners use and records.

F. Submit an electronic copy of all final and approved as-built drawings on a CD in AutoCAD version 2014 and PDF format.

1.8 WARRANTIES

A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, number and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

D. Submit one electronic file of all warranties on a CD in PDF format.

1.9 LANDSCAPE REPAIRS

A. Landscape repairs at standard lawn areas: At areas indicated as "lawn" areas used for contractor parking and material storage shall have the topsoil removed, the subsoil shall be loosened to 12" below finished grade, the topsoil shall be replaced and amended with a complete, slow release fertilizer, proof rolled and seeded with a restoration seed mix as specified in Section 32 92 00 "Turf and Grasses."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 02 30 00 – SOIL INVESTIGATION DATA

PART 1 - GENERAL

1.1 SUBSURFACE CONDITIONS

A. The owner has explored subsurface conditions by having authorized the making of borings and test pits on site.

B. Factual subsurface information (boring logs, test pit logs, and physical soils laboratory testing) have been included as part of these specifications. The logs describe subsurface conditions encountered at the exploration locations at the time explorations were made. Actual subsurface conditions may vary due to conditions not evident at the time explorations were made, and therefore no warranties, expressed or implied, are made as to accuracy of subsurface information provided herein.

C. No warranty is made of the continuity of strata or material between the exploration locations. The stratification lines on the logs represent approximate boundaries between soil types. The actual transitions may be gradual.

D. Boring locations shown on the drawings are approximate only and the Owner makes no representations regarding correctness of such information.

E. Bidders shall make their own deductions of subsurface conditions which may affect methods or cost of construction. Bidders may, at their own expense, and upon applications to the OWNER, conduct additional subsurface testing.

1.2 GEOTECHNICAL ENGINEERING REPORTS AND SAMPLES

A. Reports entitled "Environmental Soil Investigation at Hamilton Avenue School", “Soil Evaluation Test Result” as prepared by Milone & MacBroom, Inc., and "Geotechnical Engineering Report" as prepared by Langan Engineering and Environmental Services for use by the Engineer in the design of the project. Part of the information contained in these reports is interpretive (not factual) and therefore shall not be considered as part of the information provided for this contract. However, the Contractor is entitled to the physical data (free of interpretation) including the data presented in the boring logs and results of physical soils laboratory testing. These reports can be found in Appendix A of this project manual.

PART 2 - PRODUCTS

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 31 10 00 – SITE CLEARING

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. This Section includes the following:

1. Protecting existing trees, plants and grass to remain
2. Removing existing trees, plants and grass
3. Clearing and grubbing
4. Stripping and stockpiling topsoil
5. Removal of site amenities
6. Removal of chain link fence backstop
7. Temporary erosion and sedimentation control measures

B. Related Section

1. Section 31 20 00 – Earth Moving
2. Section 31 25 00 – Erosion and Sedimentation Controls
3. Section 32 92 00 – Turf and Grasses

1.3 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.4 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. 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, "Call Before You Dig" at 1-800-922-4455 for area where Project is located prior to site clearing.

D. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

1.5 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 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016 edition shall be used for material compliance and execution of the work in this section.

C. Submittals

1. Silt fence

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Topsoil: Requirements for topsoil are specified Section 32 92 00 "Turf and Grasses."

2.2 SEDIMENT AND EROSION CONTROL MEASURES

A. Materials: As specified as on the Contract Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to Town of Greenwich and DEEP requirements and sediment and erosion control drawings.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE PROTECTION

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 Landscape Architect.

3.4 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil. Treatment of a glyphosate-based herbicide such as RoundUp is **not** permitted to kill existing grass prior to stripping.

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 in locations required by the engineer. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3.5 REMOVAL OF CHAIN LINK FENCE

A. Remove existing chain link fence backstop and all foundations as shown on the plans and as necessary to facilitate new construction. All materials will become property of the Contractor and should be disposed of in an acceptable manner.

3.6 DISPOSAL

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

END OF SECTION

SECTION 31 20 00 – EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Refer to Geotechnical Engineering Reports included in Appendix A of this Project Manual.

B. 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 structures, walks, pavements, natural turf fields, sports courts, lawns and grasses, and plantings
2. Excavating and backfilling for structures
3. Processed aggregate base for bituminous concrete walks
4. Processed aggregate base for bituminous concrete pavements, pads, etc.
5. Excavating and backfilling for utility trenches and storm drainage structures
6. Rock Excavation
7. Rock-in Trench Excavation

C. Related Sections

1. Section 32 12 16 – Asphalt Paving
2. Section 32 90 00 – Planting
3. Section 32 92 00 – Turf and Grasses
4. 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 Engineer.
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. Processed Aggregate: Course placed between the subbase course and hot-mix asphalt 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. Structural Fill: Fill placed over the excavated subgrade in the building area, exterior foundation wall backfill, outside of the zone of crushed stone backfill.

H. Borrow Soil: Satisfactory soil imported from off-site for use as ordinary fill or backfill.

I. Drainage Course / Crushed Stone: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

J. Ordinary Fill: General fill and backfill placed outside the limits of Structural Fill, Sand and Gravel, and Crushed Stone.

K. Subbase: Course placed between the subgrade and base course for hot-mix asphalt pavement, and sidewalk pavements, and between the subgrade and topsoil in lawn and landscaped areas.

L. Athletic Field Base: Course placed between the subgrade and topsoil in athletic field areas.

M. Subgrade: Surface or elevation remaining after completing excavation for site remediation, or top surface of a fill or backfill immediately below subbase, drainage fill, or earthen cap materials. The elevation at which the remediation geotextile barrier layer is installed.

N. Proof-roll: The application of compactive energy to subgrade for the geotechnical engineer's evaluation of suitability of subgrade for bearing.

O. 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.

P. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

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 Engineer 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 Engineer 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. Workers: all workers 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 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016 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 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016. Test results shall be sent directly to the owner.

D. Athletic Field Base shall be tested per ASTM 2898-11 Standard Test Method for Permeability of Synthetic Turf Sports Field Base Stone and Surface System by Non-confined Area Flood Test Method (5-gallon bucket). Testing shall confirm a minimum permeability rate of 20”/hour.

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. In addition, submit laboratory analytical results for sample(s) of the material, at least two (2) weeks prior to the import of material.

B. Processed Aggregate: per Standard Specification 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: per Standard Specification M.02.06 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 see Section 3.11 COMPACTION OF SOIL BACKFILLS AND FILLS of this specification.

E. Athletic Field Base: Gravel Course placed on prepared subgrade beneath the topsoil layer in athletic field areas designated on the plans. Material shall conform to Form 817 - Section M.02.01 for Granular Fill – Broken or crushed stone. Reference to Article M.02.06 - Grading "A" shall be replaced with the following gradation:

Square Mesh Sieves	**Percent passing by weight (%)**
Pass 2-inch	100
Pass No. 10	85 – 100
Pass No. 40	20 – 40
Pass No. 100	10 – 20
Pass No. 200	0 – 10

F. Traprock: Clean Stone used as a base for various types of pavement. Nominal Size as specified in the contract drawings. Meets Standard Specifications M.02.06 2-M.02.06.04 for Soundness using AASHTO Method T 104, Resistance to Abrasion using AASHTO Method T 96, and Plasticity using AASHTO Method T 90.

G. 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

H. Crushed Stone: Material shall be per Section M.02.01 per CT DOT Form 817.

I. Pervious structure backfill: Pervious material placed adjacent to structure shall conform to Standard Specification M.02.05. Reclaimed miscellaneous aggregate shall not be used.

J. Stone Dust Surface/Screenings: Material shall conform to the gradation in Section M.01.01 of the Standard Specifications. No reclaimed miscellaneous aggregate will be allowed.

K. Sand: Layer placed between concrete slab and base. Material shall be per Section M.02, Article M.03.01 per CT DOT Form 817.

2.1 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 5 mils thick, with aluminum backing and 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 3.3 Rock Excavation shall be measured and compensated as described.

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 Engineer, without additional compensation or change in Contract Time.

C. Lawn and landscape areas are to be constructed in areas currently paved for parking and in areas utilized during construction for construction access and material storage. These areas are not considered suitable for lawn and landscape construction until subgrade conditions are properly decompacted and prepared in accordance with Section 32 90 00 – Planting and Section 32 92 00 – Turf and Grasses.

D. For subgrade areas beneath athletic fields designated to receive a layer of free draining material above the subgrade, the subgrade slopes are to match the proposed slopes for finish grade. The Contractor shall provide a survey by a licensed surveyor of as built subgrade elevations at 50' on center each way for approval by the Engineer prior to placement of free draining material. Preparation of subgrade operations is to be performed in conditions free of mud, frost, snow and ice.

E. 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 Engineer, without additional compensation or change in Contract Time.

B. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer, 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 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 817. 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%
Areas of General Landscaping	-	90%
Subgrade below Athletic Fields	-	85%

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

Compaction Method	Max 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 PROCESSED AGGREGATE BASE

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. Processed aggregate base shall be placed in accordance with Section 3.04 of the Standard Specifications Form 817.
3. Compact subbase and base course as specified in Form 817 Section 3.12, plus the requirements that compaction shall be continued until the dry density of each layer is not less than 95% of the dry density achieved by AASHTO T 180, Method D.
4. Field testing will be performed in accordance with AASHTO T 310 and ASTM D6938 as indicated in the latest edition of the "Minimum Schedule for Acceptance Testing." Should the subbase or subgrade material become churned up or mixed with the processed aggregate base at any time, the Contractor shall, without additional compensation remove the mixture. The Contractor shall add new subbase material, if required, and reshape and recompact the subbase in accordance with the requirements of Article 2.12.03. New aggregate material shall be added, compacted and bound, as hereinbefore specified, to match the surrounding surface. Any surface irregularities which develop during, or after work on each course, shall be corrected by loosening material already in place and removing or adding aggregate as required. 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. In addition, the finished surface shall be tested for level using a 10-foot straight edge. The surface shall not vary from the specified grade by more than ¼ inch in 10 feet measured in any direction. Irregularities shall be corrected to the satisfaction of the Engineer.

3.15 ATHLETIC FIELD BASE MATERIAL PLACEMENT

A. Once the prepared subgrade is properly decompacted, graded, and elevations approved, placement of the free draining material may commence.

B. Place free draining course on subgrades free of mud, frost, snow, or ice.

C. Allowable maximum soil compaction for the free draining material is 90%.

3.16 DRAINAGE COURSE

A. Place free draining course on subgrades free of mud, frost, snow, or ice.

1. On prepared subgrade, place and compact drainage course under bituminous concrete trail as specified.

3.17 FIELD QUALITY CONTROL

A. Testing Agency: Owner 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. Footing Subgrade: Footing subgrades shall be evaluated by the geotechnical engineer for suitability for foundation bearing.

D. 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.

3.18 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.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property at no additional cost.

END OF SECTION

SECTION 31 25 00 – EROSION AND SEDIMENTATION CONTROLS

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, inlet protection and/or hay bales to control surface water.

B. Compliance with permit requirements of the local inland wetlands.

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 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016 edition including current supplements, unless otherwise specified herein and the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control."

B. Workers: all workers 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 woven filter fabric and will meet the AASHTO M-288 and ASTM D-4439 for silt fence and geotextile usage.

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 or Owner's representative.

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

SECTION 32 12 16 – ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Work under this section shall include the production, delivery and placement of a non-segregated, smooth and dense bituminous concrete mixture brought to proper grade and cross section. This section shall also include the method and construction of longitudinal joints.

B. The terms listed below as used in this specification are defined as:

1. Bituminous Concrete: A concrete material that uses a bituminous material (typically asphalt) as the binding agent and stone and sand as the principal aggregate components. Bituminous concrete may also contain any of a number of additives engineered to modify specific properties and/or behavior of the concrete material. For the purposes of this Specification, references to bituminous concrete apply to all of its sub-categories, for instance those defined on the basis of production and placement temperatures, such as hot-mix asphalt (HMA) or those categories derived from the mix-design procedure used, such as "Marshall" mixes or "Superpave" mixes.

Types of Bituminous Concrete Mix Designations		
Official Mix Designation Designation	English Equivalent Mix Designation	SI Equivalent Mix Designation
HMA S1	Superpave 1.0 inch	Superpave 25.0 mm
HMA S0.5	Superpave 0.5 inch	Superpave 12.5 mm
HMA S0.375	Superpave 0.375 inch	Superpave 9.5 mm
HMA S0.25	Superpave 0.25 inch	Superpave 6.25 mm
Bituminous Concrete Class 1	~	~
Bituminous Concrete Class 2	~	~
Bituminous Concrete Class 3	~	~
Bituminous Concrete Class 4	~	~
Bituminous Concrete Class 12	~	~

2. Course: A lift or multiple lifts comprised of the same bituminous concrete mixture placed as part of the pavement structure.
3. Density Lot: All material placed in a single lift and as defined below.
4. Disintegration: Wearing away or fragmentation of the pavement. Disintegration will be evident in the following forms: Polishing, weathering-oxidizing, scaling, spalling, raveling, potholes or loss of material.
5. Hot Mix Asphalt (HMA): A bituminous concrete mixture typically produced at 325°F.
6. Lift: An application of a bituminous concrete mixture placed and compacted to a specified thickness in a single paver pass.
7. Marshall: A bituminous concrete mix design used in mixtures designated as "Bituminous Concrete Class ( )."
8. Production Lot: All material placed per day during a continuous daily paving operation.
9. Quality Assurance (QA): All those planned and systematic actions necessary to provide confidence that a product or facility will perform as designed.

10. Quality Control (QC): The sum total of activities performed by the vendor (Producer, Manufacturer, and Contractor) to ensure that a product meets contract specification requirements.
11. Superpave: A bituminous concrete mix design used in mixtures designated as "S*" Where "S" indicates Superpave and * indicates the sieve related to the nominal maximum aggregate size of the mix.
12. Segregation: A non-uniform distribution of a bituminous concrete mixture in terms of volumetric, gradation, or temperature.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials shall conform to the requirements of Section M.04 in the Standard Specifications (CT DOT Form 817) except that this not being a Connecticut Department of Transportation (CT DOT) project there will not be any testing by CT DOT. All references regarding CT DOT testing shall be deleted and replaced with the material producers and/ or suppliers may be subject to inspecting and testing by the Owner and/ or his representatives.

B. Materials Supply: The bituminous concrete mixture must be from one source of supply and originate from one Plant unless authorized by the Owner. The bituminous concrete mixture shall be produced at an approved Connecticut DOT Plant. The Contractor shall provide proof of current DOT plant approval status. Bituminous Concrete plant QC plan requirements are defined in Section M.04.

C. Recycle Option: The Contractor has the option of recycling reclaimed asphalt pavement (RAP) or Crushed Recycled Container Glass (CRCG) in bituminous concrete mixtures in accordance with Section M.04. CRCG shall not be used in the final lift of the surface course.

PART 3 - EXECUTION

3.1 MATERIAL DOCUMENTATION

A. All vendors producing bituminous concrete must have their truck-weighing scales, storage scales, and mixing plant automated to provide a detailed ticket.

B. Delivery tickets must include the following information:

1. Project name printed on ticket.
2. Name of producer, identification of plant, and specific storage bin (silo) if used.
3. Date and time of day.
4. Mixture Designation If RAP is used, the plant printouts shall include RAP dry weight, percentage and daily moisture content. Class 3 mixtures for machine-placed curbing must state "curb mix only."
5. Net weight of mixture loaded into truck (When RAP is used, RAP moisture shall be excluded from mixture net weight).
6. Gross weight (Either equal to the net weight plus the tare weight or the loaded scale weight).
7. Tare weight of truck – Daily scale weight.

8. Project number, purchase order number, name of Contractor (if Contractor other than Producer).
9. Truck number for specific identification of truck.
10. Individual aggregate, RAP, and virgin asphalt high/target/low weights shall be printed on batch plant tickets (For drum plants and silo loadings, the plant printouts shall be printed out at 5 minute intervals maintained by the vendor for a period of three years after the completion of the project).
11. For every mixture designation the running daily total delivered and sequential load number.

C. The net weight of mixture loaded into the truck must be equal to the cumulative measured weight of its components.

D. The Contractor must notify the Owner immediately if, during the production day, there is a malfunction of the weighing or recording system in the automated plant or truck-weighing scales. Manually written tickets containing all required information will be allowed for one hour, but for no longer, provided that each load is weighed on State-approved scales. The Owner reserves the right to monitor the plant's bituminous concrete mixture production for batching and/or weighting operation.

3.2 TRANSPORTATION OF MIXTURE

A. Trucks with loads of bituminous concrete being delivered to the projects must not exceed the statutory or permitted load limits referred to as gross vehicle weight (GVW).

B. The mixture shall be transported from the mixing plant in trucks that have previously been cleaned of all foreign material and that have no gaps through which mixture might inadvertently escape. The Contractor shall take care in loading trucks uniformly so that segregation is minimized. Loaded trucks shall be tightly covered with waterproof covers acceptable to the Owner. Mesh covers are prohibited. The front and rear of the cover must be fastened to minimize air infiltration. The Contractor shall assure that all trucks are in conformance with this specification. Trucks found not to be in conformance shall not be allowed to be loaded until re-inspected to the satisfaction of the Owner.

C. Truck body coating and cleaning agents must not have a deleterious effect on the transported mixture. The use of solvents or fuel oil, in any concentration, is strictly prohibited for the coating of the inside of truck bodies. When acceptable coating or agents are applied, truck bodies shall be raised immediately prior to loading to remove any excess agent in an environmentally acceptable manner.

3.3 PAVING EQUIPMENT

A. The Contractor shall have the necessary paving and compaction equipment at the project site to perform the work. All equipment shall be in good working order and any equipment that is worn, defective or inadequate for performance of the work shall be repaired or replaced by the Contractor to the satisfaction of the Owner. During the paving operation, the use of solvents or fuel oil, in any concentration, is strictly prohibited as a release agent or cleaner on any paving equipment (i.e., rollers, pavers, transfer devices, hand tools, etc.).

B. Refueling of equipment is prohibited in any location on the paving project where fuel might come in contact with bituminous concrete mixtures already placed or to be placed. Solvents for use in cleaning mechanical equipment or hand tools shall be stored clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved off the paved or to be paved area; and they shall not be returned for use until after they have been allowed to dry.

C. Pavers: Each paver shall have a receiving hopper with sufficient capacity to provide for a uniform spreading operation and a distribution system that places the mix uniformly, without segregation. The paver shall be equipped with and use a vibratory screed system with heaters or burners. The screed system shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screed units as part of the system shall have auger extensions and tunnel extenders as necessary. Automatic screed controls for grade and slope shall be used at all times unless otherwise authorized by the Owner. The controls shall automatically adjust the screed to compensate for irregularities in the preceding course or existing base. The controls shall maintain the proper transverse slope and be readily adjustable, and shall operate from a fixed or moving reference such as a grade wire or floating beam.

D. Rollers: All rollers shall be self-propelled and designed for compaction of bituminous concrete. Roller types shall include steel-wheeled, pneumatic or a combination thereof and may be capable of operating in a static or dynamic mode. Rollers that operate in a dynamic mode shall have drums that use a vibratory or oscillatory system or combination of. The vibratory system achieves compaction through vertical amplitude forces. Rollers with this system shall be equipped with indicators that provide the operator with amplitude, frequency and speed settings/readouts to measure the impacts per foot during the compaction process. The oscillatory system achieves compaction through horizontal shear forces. Rollers with this system shall be equipped with frequency indicators. Rollers can operate in the dynamic mode using the oscillatory system on concrete structures such as bridges and catch basins if at the lowest frequency setting.

E. Pneumatic tire rollers shall be self-propelled and equipped with wide-tread compaction tires capable of exerting an average contact pressure from 60 to 90 pounds per square inch uniformly over the surface, adjusting ballast and tire inflation pressure as required. The Contractor shall furnish evidence regarding tire size; pressure and loading to confirm that the proper contact pressure is being developed and that the loading and contact pressure are uniform for all wheels.

F. Lighting: For paving operations, which will be performed during hours of darkness, the paving equipment shall be equipped with adequate lighting fixtures approved by the Owner.

3.4 SEASONAL REQUIREMENTS

A. All paving, including placement of temporary pavements, shall be divided into two seasons, In-Season and Extended Season. In-Season paving shall occur from May 1 – October 31, and

Extended Season shall occur from November 1- April 30. The following requirements shall apply unless otherwise authorized or directed by the Owner:

1. Bituminous concrete mixes shall not be placed when the air or subbase temperature is below 40°F regardless of the season.
2. The Contractor shall not schedule paving operations during the Extended Season without prior approval from the Owner The Contractor shall also provide to the Owner an "Extended Season Paving Plan" as outlined below as part of the Extended Season approval process:

    a. An "Extended Season Paving Plan" shall be submitted to the Owner a minimum of two (2) weeks prior to the Contractor's anticipated paving operations and shall address minimum delivered mix temperature, maximum paver speed, enhanced rolling patterns and the method to balance mixture delivery and placement operations. Extended Season paving shall not commence until the Owner has approved the "Extended Season Paving Plan".

3. The final lift of bituminous concrete shall not be placed between November 1 and April 30. The Owner, at his discretion, may consider a request from the Contractor to allow placing the top course bituminous concrete if it is deemed to be in the best interest of the project.
4. There will be no additional compensation in relation to when bituminous concrete is placed.

3.5 TRANSITIONS FOR ROADWAY SURFACE

A. Transitions shall be formed at any point on the roadway where the pavement surface deviates, vertically, from the uniform longitudinal profile as specified on the plans. Whether formed by milling or by bituminous concrete mixture, all transition lengths shall conform to the criteria below unless otherwise specified.

B. Permanent Transitions: A permanent transition is defined as any transition that remains as a permanent part of the work. All permanent transitions, leading and trailing ends shall meet the following length requirements:

1. Posted speed limit is greater than 35 MPH: 30 feet per inch of vertical change (thickness)
2. Posted speed limit is 35 MPH or less: 15 feet per inch of vertical change (thickness).
3. Bridge Overpass and underpass transition length will be 75 feet either

    a. Before and after the bridge expansion joint, or
    b. Before or after the parapet face of the overpass.

4. In areas where it is impractical to use the above described permanent transition lengths the use of a shorter permanent transition length may be permitted when approved by the Owner.

C. Temporary Transitions: A temporary transition is defined as a transition that does not remain a permanent part of the work. All temporary transitions shall meet the following length requirements:

1. Posted speed limit is greater than 35 MPH

    a. Leading Transitions = 15 feet per inch of vertical change (thickness)
    b. Trailing Transitions = 6 feet per inch of vertical change (thickness)

2. Posted speed limit is 35 MPH or less

    a. Leading and Trailing = 4 feet per inch of vertical change (thickness)

Note: Any temporary transition to be in-place over the winter shutdown period, holidays, or during extended periods of inactivity (more than 7 calendar days) shall conform to the "Permanent Transition" requirements shown above and shall be approved by the Owner prior to implementation.

3.6 SPREADING AND FINISHING OF MIXTURE

A. Prior to the placement of the bituminous concrete, the underlying base course shall be brought to the plan grade and cross section within the allowable tolerance. Immediately before placing the mixture, the area to be surfaced shall be cleaned by sweeping or by other means acceptable to the Owner. The bituminous concrete mixture shall not be placed whenever the surface is wet or frozen. The temperature of the bituminous concrete mixture at time of placement must be between 265°F. to 325°F. except that the minimum temperature will be 290°F. when the mixture is placed during the Extended Season.

B. The mix temperature may be verified by the Owner at the time and location of placement by means of a probe or infrared type of thermometer to confirm conformance with this specification.

C. Placement: The bituminous concrete mixture shall be placed and compacted to provide a smooth, dense surface with a uniform texture and no segregation at the specified thickness and dimensions indicated in the plans and specifications.

When unforeseen weather conditions prevent further placement of the mix, the Owner is not obligated to accept or place the bituminous concrete mixture that is in transit from the plant or already at the project site awaiting placement.

In advance of paving, traffic control requirements as stipulated under the relevant sections of the Contract Documents shall be set up daily, maintained throughout placement, and shall not be removed until all associated work including density testing is completed.

The Contractor shall inspect the newly placed pavement for defects in the mixture or placement before rolling is started. Any deviation from standard crown or sections shown on the plans, or nonconforming to adjacent existing conditions, shall be immediately remedied by placing additional mixture or removing surplus mixture prior to commencing compaction operations. Such defects shall be corrected to the satisfaction of the Owner.

Where it is impractical due to physical limitations to operate the paving equipment, the Owner may permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a thickness that will result in a completed pavement meeting the designed grade and elevation. Where hand spreading is permitted by the Owner, it shall not relieve the Contractor of his responsibility to comply with all compaction requirements. The Contractor shall use such equipment as may be necessary to ensure proper compaction has been attained in areas of hand spreading without damage to nearby or adjacent structures/amenities or completed work.

D. Placement Tolerances: Each lift of bituminous concrete placed at a uniform specified thickness shall meet the following requirements for thickness and area. Any pavement exceeding these limits shall be subject to removal and replacement. Lift tolerances will not relieve the Contractor from the responsibility of meeting the final designed grades and cross sections.

The Contractor shall provide copies of all bituminous concrete delivery slips to the Owner for each daily section of pavement placed to determine the theoretical thickness of the in place material as follows:

Theoretical Thickness = T/A_a x 0.0575

Where: T = Actual tons in place
A_a = Actual area (SY)
Yield factor for calculation = 0.0575 Tons/ SY/ inch

E. Thickness: When the thickness of the lift of mixture is less than that shown on the plans beyond the tolerances shown in Table A, the Contractor, shall remove the deficient section and replace it with the specified thickness of material of the same class and to the dimensions as specified in the Contract Documents at their own cost.

TABLE A - Thickness Tolerances

Mixture Designation	Lift Tolerance
Class 4 and S1	+ ⅜ inch*
Class 1, 2 and 12 and S0.25, S0.375, S0.5	+ ¼ inch*

*There is no negative lift tolerance, the minimum lift thickness shall be equal to the designed thickness indicted on plans.

When requested by the Owner, if quality or thickness is a disputed issue then, the Contractor, will provided pavement cores as another means to confirm the pavement thicknesses at no additional cost to the Owner. If the Contractor does not provide cores within 72 hours from the Owner request, then the Owner reserves the right to hire a third party to provide core samples to verify thickness. The cost of which will be deducted from the Contractor's progress payments and/ or retainage.

F. Longitudinal Joint Construction: All joints shall be straight and true to adjacent improvements. During placement of multiple lifts of bituminous concrete, the longitudinal

joint shall be constructed in such a manner that it is located at least 6 inches from the joint in the lift immediately below. The Contractor shall plan his daily paving operation so that each paving length is the full width of area being paved. No exposed longitudinal joint edges will be allowed unless authorized by the Owner. Prior to placing the completing pass (hot side), an application of tack coat must be applied to the exposed edge of the preceding paving pass of bituminous concrete regardless of time elapsed between paver passes. The in-place time allowance described in Sub article "Tack Coat Application" below does not apply to joint construction.

G. Transverse Joints: All transverse joints shall be formed by saw-cutting a sufficient distance back from the previous run, existing bituminous concrete pavement, or bituminous concrete driveways to expose the full thickness of the lift. Tack coat shall be applied on any cold joint immediately prior to additional bituminous concrete mixture placement.

H. Tack Coat Application: A thin uniform coating of tack coat shall be applied to the pavement immediately before overlaying and be allowed sufficient time to break (set). All surfaces in contact with the bituminous concrete that have been in place longer than 3 calendar days shall have an application of tack coat. The tack coat shall be applied by a non-gravity pressurized spray system that results in uniform overlapping coverage at an application rate of 0.03 to 0.05 gallons per square yard for a non-milled surface and an application rate of 0.05 to 0.07 gallons per square yard for a milled surface. For areas where both milled and un-milled surfaces occur, the tack coat shall be an application rate of 0.03 to 0.05 gallons per square yard. The Owner must approve the equipment and the method of measurement prior to use. The material for tack coat shall not be heated in excess of 160°F and shall not be further diluted. Under no circumstances shall tack coat be applied to surfaces damp to the touch or over standing water. In the event of unforeseen weather conditions, the application of tack coat shall stop until the surface to receive tack coat is dry. The Owner is not obligated to accept any bituminous concrete mixture or tack coat that is placed on/in wet conditions.

I. Tack Coat Application Rate Verification: The Contractor shall provide daily tack coat delivery tickets to the Owner for verification of application rates.

Daily Delivery tickets must include the following information:

1. Project name printed on ticket.
2. Name and location of supplier.
3. Date and time of day.
4. Product type.
5. 1st Gross weight – the loaded scale weight before application of tack coat material.
6. 2nd Gross weight – the loaded scale weight upon completion of tack coat material application.
7. Tare weight of truck – Daily scale weight.
8. Project number, purchase order number, name of Contractor (if Contractor other than Producer).
9. Truck number for specific identification of truck.

J. Compaction: The Contractor shall compact the mixture to an average density between 92.0 and 97.0 percent. All roller marks shall be eliminated without displacement, shoving, cracking, or aggregate breakage.

The Contractor shall only operate rollers in the dynamic mode using the oscillatory system at the lowest frequency setting on concrete structures such as bridges and catch basins. The use of the vibratory system on concrete structures is prohibited. Rollers operating in the dynamic mode shall be shut off when reversing directions.

If the Owner determines that the use of compaction equipment in the dynamic vibratory mode may damage highway components, utilities, or adjacent property, the Contractor shall provide alternate compaction equipment. The Owner may allow the Contractor to operate rollers in the dynamic mode using the oscillatory system at the lowest frequency setting.

These allowances will not relieve the Contractor from meeting pavement compaction requirements.

K. Surface Requirements: The pavement surface of any lift shall meet the following requirements for smoothness and uniformity. Any irregularity of the surface exceeding these requirements shall be corrected by the Contractor at his expense:

1. Smoothness – Each lift of the surface course shall not vary more than ¼ inch from a Contractor-supplied 10 foot straightedge. For all other lifts of bituminous concrete, the tolerance shall be ⅜ inch. Such tolerance will apply to all paved areas regardless of placement methods, i.e. hand spreading.
2. Uniformity – The paved surface shall not exhibit segregation, rutting, cracking, disintegration, flushing or vary in composition as determined by the Owner.

3.7 CONTRACTOR QUALITY CONTROL (QC) REQUIREMENTS FOR PLACEMENT

A. The Contractor shall be responsible for maintaining adequate quality control procedures throughout the placement operations. Therefore, the Contractor must ensure that the materials, mixture and work provided by Subcontractors, Suppliers and Producers also meet contract specification requirements.

B. A Quality Control Plan (QCP) shall be submitted for any project with a proposed tonnage greater than 2,500 tons of Bituminous Concrete and/or when the paving operation is scheduled to occur during the Extended Season with prior approval from the Owner.

C. Quality Control Plan: When required, prior to placement, the Contractor shall submit a QCP to the Owner for approval. The QCP shall be submitted at the pre-construction meeting or a minimum 30 days prior to any production or paving. Work covered by the QCP shall not commence until the Owner's comments have been incorporated into the QCP and approved. The QCP shall detail every aspect of the placement process and if required, include a separate section on Extended Season paving as described in Section 4. "Seasonal Requirements". The QCP must address the actions, inspection, minimum frequency of testing/sampling and testing necessary to keep the production and placement operations in control, to determine when an operation has gone out of control, and to respond to correct

the situation in a timely fashion. The QCP shall also include details on when and who will communicate with personnel at the bituminous concrete plant to determine when immediate changes to the production or placement processes are needed, and to implement the required changes.

Approval of the QCP does not relieve the Contractor of his responsibility to comply with the project specifications and in accordance with the Contract Documents.

D. Quality Control Inspection, Sampling and Testing: The Contractor shall perform all quality control sampling and testing, provide inspection, and exercise management control to ensure that bituminous concrete production and placement conforms to the requirements of these specifications.

1. Records of Inspection and Testing: For each day of placement, the Contractor shall document all test results and inspections on forms approved by the Owner. The document shall be certified by the Quality Control Manager or his representative that the information in the document is accurate, and that all work complies with the requirements of the contract.

3.8 DENSITY TESTING OF BITUMINOUS CONCRETE

A. The Contractor shall monitor and confirm density utilizing a nuclear density gauge of all bituminous concrete placed daily regardless of the quantity. Testing shall be performed by a NETTCP certified HMA Paving Inspector from a certified independent CT testing laboratory. The minimum frequency of testing shall be as follows.

Sub-Lots for Density Testing		
Daily Production Tons	MAT Number of Sub-Lots	JOINT Number of Sub-Lots/ Joint
Less than 500	1 per 100	1per 100
500 to 1,500	10	5
Greater than 1,500	20	10

B. The Contractor shall submit complete laboratory certified test reports and accurate density inspection reports to the Owner within 48 hours following the daily paving operations. The documents shall be submitted in a manner acceptable to the Owner.

C. All costs associated with the required density testing and reporting shall be the responsibly of the Contractor.

3.9 CORRECTIVE WORK PROCEDURES

A. Any portion of the completed pavement that does not meet the requirements of the Contract Documents shall be corrected at the expense of the Contractor. Any corrective courses placed as the final wearing surface shall not be less than 1½ inches in thickness after compaction.

B. If pavement placed by the Contractor does not meet the requirements of the Contract Documents, and the Owner requires its replacement or correction, the Contractor shall:

1. Propose a corrective procedure to the Owner for review and approval prior to any corrective work commencing. The proposal shall include:

    a. Limits of pavement to be replaced or corrected, indicating stationing or other landmarks that are readily distinguishable.
    b. Proposed work schedule.
    c. Construction method and sequence of operations.
    d. Methods of maintenance and protection of traffic.
    e. Material sources.
    f. Names and telephone numbers of supervising personnel.

2. In the event the Contractor proposes to perform corrective work during the "Extended Season," the Contractor shall provide an "Extended Season Paving Plan" and adhere to all seasonal requirements within this specification.
3. Perform all corrective work in accordance with the Contract and the approved corrective procedure.

3.10 PROTECTION OF THE WORK

A. The Contractor shall protect all sections of the newly finished pavement from damage that may occur as a result of the Contractor's operations for the duration of the Project. Prior to the Owner's authorization to open the pavement to traffic, the Contractor is responsible for the protection of the pavement from all damage.

NOTE

The Owner may at any time during the course of the work perform QA testing that he deems necessary to assure conformance to these specifications. Any deficiencies found through these actions shall be immediately corrected by the Contractor at no additional cost to the Owner. The cost associated with the re-testing of areas where corrective work was performed will be deducted from the Contractor's progress and/ or retainage

Any pavement deficiencies, corrective work and/or QC/QA issues need to be resolved prior to payment for the work under this section.

END OF SECTION

SECTION 32 18 23.43 – RECREATIONAL COURT SURFACING (BID ALTERNATE NO.2)

PART 1 - GENERAL

1.1 GENERAL DESCRIPTION

A. The work under this Item includes the furnishing and placing of the acrylic color coating system for the basketball court and the acrylic line striping.

1.2 RELATED SECTIONS

A. Related Work

1. Section 31 20 00 – Earth Moving
2. Section 32 12 16 – Asphalt Paving

1.3 SUBMITTALS

A. Manufacturer specifications for components, color chart and installation instructions.

B. Authorized Applicator certificate from the surface system manufacturer.

C. ITF classification certificate for the system to be installed.

D. Current Material Safety Data Sheets (MSDS).

E. Product substitution: If other than the product specified, the contractor shall submit at least 7 days prior to the bid date a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the owners satisfaction that the proposed substitution is of equal quality and utility to that originally specified. Information must include a QUV test of at least 1000 hours illustrating the UV stability of the system. The color system shall have an ITF pace rating in Category 2. Under no circumstances will systems from multiple manufacturers be considered.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall be regularly engaged in construction and surfacing of acrylic tennis courts, basketball courts, play courts or similar surfaces. Installer shall be an Authorized Applicator of the specified surface system.

B. Tolerance: Surface variation should not exceed 1/8 inch in 10 ft. when measured in any direction with a straight edge and slope 1 inch in 10 ft., all in one plane.

C. Weather Limitations: Do not install when rainfall in imminent or extremely high humidity prevents drying. Do not apply unless surface and air temperature are 50°F and rising. Do not apply if surface temperature is in excess of 140°F.

D. Basketball Sealer: Any permanent fixtures to be bedded into or through the bituminous concrete courses shall be installed and approved by the Engineer prior to applying the color (court) sealer.

1.5 WARRANTY

A. Guarantee: The Contractor shall provide a guarantee against defects in the materials and workmanship for a period of one year from the date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Dalton Enterprises, Inc., Cheshire, CT 06410 / Latexite System or approved equal.

2.2 MATERIALS

A. Court Sealant: Non-fading waterproof, 100% acrylic color sealer. The color shall be approved by the Town prior to application.

B. Basketball Court Striping: The paint shall be highly pigmented, 100% acrylic line paint. The color shall be white.

PART 3 - EXECUTION - Concrete (new constructions)

3.1 SLAB PREPARATION

A. Prior to the application of the color sealer, the entire court area shall be thoroughly cleaned and water-flooded to locate low areas which are more than 1/8" deep. Minor depressions (1/8"-1/4" deep) shall be leveled by troweling or screeding a layer of patch mix over the low area. Leveling material shall be Latexite Filler Coat or Latexite Asphalt Surfacer as manufactured by Dalton Enterprises, Inc. or equivalent, and applied as per manufacturer's specifications. Deeper depressions require multiple layers of patch mix. Excessively deep (1/2" or deeper) depressions shall be patched with asphaltic concrete. All rough paving joints and roller marks shall be leveled prior to application of the specified Latexite system.

3.2 ACRYLIC SURFACE

A. Latexite Acrylic Color Sealer Filler Coat shall be applied on the clean, dry underlying bituminous concrete surface course in multiple applications (min. two coats) to obtain an approximate application rate of .10 gallons per square yard, based on the material prior to any dilution. No application shall be covered by a succeeding application until thoroughly cured. Latexite Finish Coat shall be applied to the clean, dry underlying surface of Filler Coat in a minimum single application to obtain a total application rate of .05 gallons per square yard, based on the material prior to any dilution. No application shall be covered by succeeding application until thoroughly cured.

B. The finished surface shall have a uniform appearance and shall be free of ridges and tool marks.

C. Time and method of application shall be as recommended by the manufacturer and approved by the Engineer.

3.3 PROTECTION

A. Erect temporary barriers to protect coatings during drying and curing.

3.4 PLAYING LINES (EXISTING COURT)

A. Line shall be 2" wide unless otherwise noted on the drawings. Lines hall be carefully laid out in accordance with ASBA guidelines and the dimensions shown on the plans. The area to be marked shall be taped to insure a crisp line. The Line Paint shall have a texture similar to the surrounding play surface. Application shall be made by brush or roller at the rate of 150-200 sg./gal.

3.5 CLEAN-UP

A. Clean Up: Remove all containers, surplus materials, and debris. Dispose of materials in accordance with local, state and Federal regulations. Leave site in a clean and orderly condition.

END OF SECTION

SECTION 32 19 00 – SKINNED INFIELD

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the material and labor requirements for construction of a complete infield skin surface using the following material:

1. DuraEdge Classic Infield Mix

B. Related Sections:

1. Site Preparation
2. Earthwork

1.2 SUBMITTALS

A. Product Data: For the product specified, submit a 5-pound sample along with a private lab test result indicating the particle size analysis of the material specified. All tests shall be performed in accordance with ASTM F-1632.

B. Approved Testing Lab: Turf & Soil Diagnostics
35 King Street
Trumansburg, NY 14886
(607) 387-5694

1.3 PROJECT/SITE CONDITIONS

A. All site work and earthwork shall be performed in accordance with the preceding sections. Sub- base material shall compact to 90 percent. If conditions do not warrant such compaction then an imported select granular fill shall be installed. Furthermore, the compacted sub-grade shall be installed in accordance with the final slope and shall mirror finish grade in order to ensure an even depth of material once placement has occurred.

B. Under no circumstances are perforated pipe under drains necessary or recommended for use under any infield skin material. Geotextile fabric is not recommended between the compacted sub-base and the infield skin material.

C. In certain instances, and where warranted, a survey of the sub-grade elevations shall occur prior to placement of the infield skin material.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installers of materials specified shall have, at minimum, five successful installations of similar projects and materials. Installers shall be in possession of and demonstrate knowledge of the use of laser guided finishing equipment.

B. Material: If quality control samples are specified, they shall be completed at a rate of one per 250 tons of material delivered to the jobsite. All tests shall be conducted by the lab specified in Section 1.2 (B). All testing will be compared to and be in accordance with the material specifications provided in Section 2.2.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. DuraEdge Classic Infield Mix is produced in various locations throughout the United States of America by and at the direction of the following manufacturer:

1. DuraEdge Products, Inc.
149 South Broad Street
Grove City, PA 16127
Phone: (866) 867-0052 Fax: (724) 264-4174
Email: info@duraedge.com Website: www.duraedge.com

2.2 MATERIALS

A. DuraEdge Classic Infield Mix is an engineered soil product which is mechanically mixed offsite in a controlled environment using a pugmill-type mixer. This process ensures thorough mixing of the sand and clay components to exact specifications.

B. Performance Specification

1. Infield mix shall be clean, dry clay mixed with washed mason-type sand resulting in a weed-free mixture that is reddish brown in color having a yield of 1.35 tons per cubic yard when placed loose or 1.5 tons per cubic yard when compacted 85% - 90% on a Standard Proctor Test (ASTM D 689-07). The material possesses the following particle size analysis:

a. Total sand content shall be 70-75 percent.
b. The combined amount of sand retained on the medium, coarse and very coarse sieves shall be greater than or equal to 50 percent.
c. The combined amount of silt and clay shall be 25-30 percent.
d. The ratio of silt divided by clay, otherwise known as the SCR, shall be 0.5 – 1.0.
e. No particles greater than 3 millimeters.
f. Equal to or less than 5 percent of particles shall be retained on the 2 millimeter.

Materials meeting this specification would be DuraEdge Classic Infield Mix as manufactured by DuraEdge Products, Inc., Grove City, PA, (866) 867-0052, or an approved equal.

C. Amendments

1. Certain amendments are approved for use with DuraEdge Classic Infield Mix and shall be installed at the architect's discretion in accordance with the manufacturer's recommendations. Contact the manufacturer for further instructions.

2.3 EXCESS MATERIALS

A. Provide the owners' authorized representative with a 10-ton stockpile of material for future use.

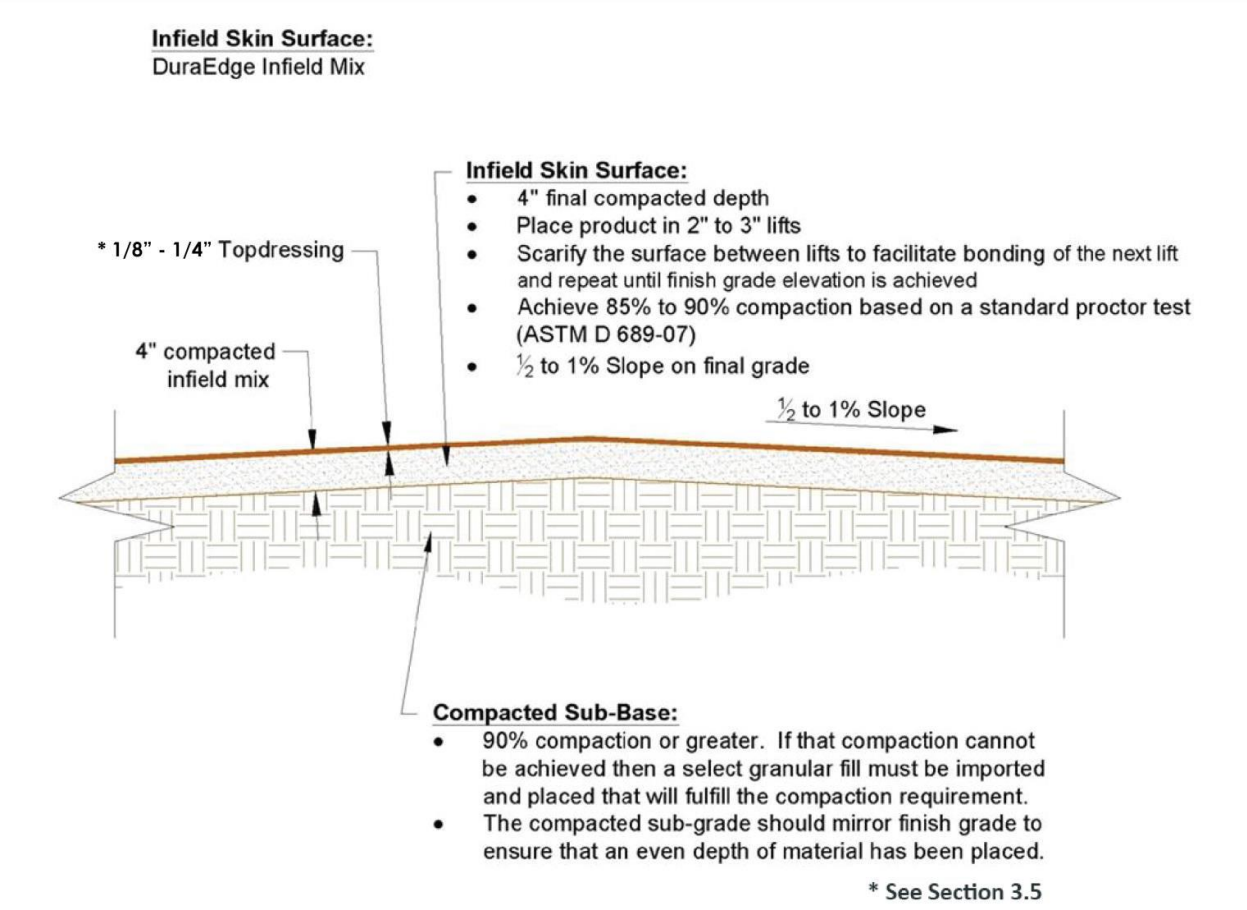
PART 3 - EXECUTION

3.1 PLACEMENT

A. Place the material in lifts of 2 to 3 inches and lightly compact until an optimum compaction between 85 and 90 percent is achieved on a standard proctor test (ASTM D 689-07). Scarify the surface to facilitate bonding of the next lift and repeat until finish grade elevation is achieved. Completing this process as described will minimize settling and improve the performance of the product. See diagram in 3.1.C. After rolling the first layer, the surface shall be lightly scarified with a rake prior to applying the second layer.

B. Depth of the material shall be 4 inches for new construction when finished and compacted. See diagram in 3.1.C.

C. Typical cross-section of infield skin:



3.2 WATERING

A. In most cases, the material is delivered with optimum moisture and adding water is not necessary. If unable to achieve optimum compaction, a light application of water may be needed.

3.3 FINISH GRADING

A. For best results the material shall be finish graded with a laser device that allows accuracy to +/- 1/8 inch. A slope of 1/2 percent to 1 percent shall be placed on the infield surface in order to facilitate surface drainage.

3.4 INSPECTION

A. The finished surface of the infield shall be smooth and free from any visible dips, humps, bumps or other blemishes which would hinder the removal of water through positive surface

drainage. Where warranted, a finished elevation survey shall be conducted to assure proper installation.

3.5 TOPDRESSING

A. Following successful inspection, topdressing shall be applied to the surface for optimum product performance. This topdressing is either expanded shale or calcined clay product and shall be added at a rate of 0.5 pounds per 1 square foot for maintenance, or 1 pound per 1 square foot for new construction.

B. Product is either ProSlide Engineered Topdressing (expanded shale) or Turface Pro League Heritage Red Conditioner (calcined clay), or approved equal. Both products are available through DuraEdge Products, Inc., Grove City, PA, (866) 867-0052. Turface is also available through Profile Products LLC, 750 Lake Cook Rd, Suite 440, Buffalo Grove, Ill., (800) 207-6457.

END OF SECTION

SECTION 32 31 14 – COLOR CHAIN LINK FENCE

PART 1 - GENERAL

1.1 SUMMARY

A. Provide all equipment, materials, and appurtenances to do all work necessary to construct the color chain link fence and gates, as indicated on the drawings and as specified. Work includes but is not limited to the following:

1. Color fence framing system
2. Color chain link fence fabric

1.2 RELATED WORK

A. Examine contract documents for requirements that affect work of this section.

1.3 QUALITY ASSURANCE

A. Chain link fencing manufactured in accordance with the requirements of the CLFMI Manual. Manufacturer of the fencing system must be a CLFMI member.

B. Form 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016 edition with supplements shall be used for material compliance and execution of the work in this section.

1.4 SUBMITTALS

A. Product Data: Submit catalog cuts and manufacturer's detail specifications for all materials and equipment to be incorporated into the work.

B. Warranty: Color chain link fence systems supplied with minimum fifteen (15) year factory warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Framework for color chain link fence systems shall conform to Ameristar® PermaCoat® PC-40™ Fence Pipe (industrial weight), as manufactured by Ameristar Fence Products in Tulsa, Oklahoma or approved equal. Qualified manufacturers shall have a minimum of five years of experience manufacturing PVC coated chain link fencing.

B. Obtain chain link fences and gates, including accessories, fittings, and fastenings, from a single source.

C. Removable Chain Link Fence System: shall be as manufactured by OZCO Building Products, 216 N. Interurban, Richardson, TX 75081, (469) 916-7503. Or approved equal.

2.2 MATERIAL – STEEL FRAMEWORK

A. The steel material used to manufacture fence pipe shall be zinc-coated steel strip, galvanized by the hot-dip process conforming to the criteria of ASTM A653 and the general requirements of ASTM A924.

B. The zinc used in the galvanizing process shall conform to ASTM B6. Weight of zinc shall be determined using the test method described in ASTM A90 and shall conform to the weight range allowance for ASTM A653, Designation G-210.

C. The framework shall be manufactured in accordance with commercial standards to meet the strength (50,000 psi minimum yield strength) and coating requirements of the following standards: 1.) ASTM F1043, Group IC, Electrical Resistance Welded Round Steel Pipe, heavy industrial weight. 2.) M181, Type I, Grade 2, Electrical Resistance Welded Steel Pipe. 3.) RR-F-191/3, Class 1, Grade B, Electrical Resistance Welded Steel Pipe.

D. The exterior surface of the electrical resistance weld shall be recoated with the same type of material and thickness as the basic zinc coating.

E. The manufactured framework shall be subjected to a complete thermal stratification coating process (multi-stage, high-temperature, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish.

F. The material used for the base coat shall be a zinc-rich (gray color) thermosetting epoxy; the minimum thickness of the base coat shall be (2) mils. The material used for the finish coat shall be a thermosetting "no-mar" TGIC polyester powder; the minimum thickness of the finish coat shall be (2) mils. The stratification coated pipe shall demonstrate the ability to endure a salt-spray resistance test in accordance with ASTM B117 without loss of adhesion for a minimum exposure time of 3,500 hours. Additionally, the coated pipe shall demonstrate the ability to withstand exposure in a weather-ometer apparatus for 1,000 hours without failure in accordance with ASTM D1499 and to show satisfactory adhesion when subjected to the cross-hatch test, Method B, in ASTM D3359. The polyester finish coat shall not crack, blister or split under normal use.

G. The color of all frame work is as indicated on the plan sheets and shall be in accordance with ASTM F934.

H. The strength of fence pipe shall conform to the requirements of ASTM F1043; the minimum weight shall not be less than 90% of the nominal weight. The strength of line, end, corner and pull posts shall be determined by the use of 4' or 6' cantilevered beam test. An alternative method of determining pipe strength is by the calculation of bending moment. Conformance with this specification can be demonstrated by measuring the yield strength of a randomly selected piece of pipe from each lot and calculating the section modulus. The yield strength shall be determined according to the methods described in ASTM E8. For materials under this specification, the 0.2 offset method shall be used in determining yield strength. Terminal posts, line posts and top/bottom rails shall be precut to specified lengths.

2.3 MATERIAL – FENCE FABRIC

A. The material for chain link fence fabric shall be manufactured from galvanized steel wire. The weight of zinc shall meet the requirements of ASTM F668. Galvanized wire shall be PVC-coated to meet the requirements of ASTM F668. The class of the fence fabric shall be Class 2B – Fused and Bonded.

B. Selvage: Top edge knuckled and bottom edge knuckled.

C. Color: The coating color for the fence fabric is as indicated on the plan sheets. Reference ASTM F688 and ASTM F934.

D. Wire Size: The size of the steel wire core shall be is as indicated on the plan sheets.

E. Height and Mesh Size: The fabric height shall be as indicated on the plan sheets with a mesh size as is indicated on the plan sheets.

2.4 MATERIAL – FENCE FITTINGS

A. The material for fence fittings shall be manufactured to meet the requirements of ASTM F626. The coating for all fittings shall be the same color coating system required for the framework; the color for all fittings shall be as indicated on the plan sheets in accordance with ASTM F934.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify areas to receive fencing are completed to final grades and elevations.

B. Ensure property lines and legal boundaries of work are clearly established.

3.2 CHAIN LINK FENCE FRAMING INSTALLATION

A. Install chain link fence in accordance with ASTM F567.

B. Space line posts uniformly and as indicated on the plans.

C. Concrete set terminal and gate posts: Drill holes in firm, undisturbed or compacted soil. Holes should have a diameter 4 times greater than outside of post, and depths approximately 6" (150 mm) deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36" (900 mm) below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour. Trowel finish around post. Slope to direct water away from posts.

D. Gate hardware: Set keepers, stops, sleeves, and other accessories into concrete.

E. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

F. Bracing: Install horizontal pipe brace at mid-height for fences 6' (1830 mm) and over, on each side of terminal posts. Firmly attach with fittings. Install diagonal truss rods at these points. Install braces and adjust truss rod, ensuring posts remain plumb.

G. Tension wire: Provide tension wire at bottom of fabric. Install tension wire before stretching fabric and attach to each post with ties or clips. Secure tension wire to fabric with 12-1/2 gauge [.0985" (2.502 mm)] hog rings 24" on center (609.6 mm).

H. Top rail: Install lengths, 21' (6400 mm). Connect joints with sleeves for rigid connections for expansion/contraction.

I. Rails: Center rails are to be installed when fence fabric is 12' (3658 mm) or higher or when shown on drawings. Bottom rails (optional) are to be installed when shown on drawings.

3.3 CHAIN LINK FABRIC INSTALLATION

A. Fabric: Install fabric on court side, and attach so that fabric remains in tension after pulling force is released. Leave approximately 2" (50 mm) between finish grade and bottom selvage. Attach fabric with wire ties to line posts at 15" (380 mm) on center and to rails, braces, and tension wire at 24" (600 mm) on center.

B. Tension (stretcher) bars: Pull fabric taut; thread tension bar through fabric and attach to terminal posts with bands spaced maximum of 15" (380 mm) on center.

3.4 ACCESSORIES

A. Tie wires: Bend ends of wire to minimize hazard to persons and clothing.

B. Fasteners: Install nuts on side of fence opposite fabric side for added security.

3.5 CLEANING

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

END OF SECTION

SECTION 32 32 19 – BASEBALL/SOFTBALL BACKSTOP

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. This work shall consist of furnishing and installing woven chain link fence backstops of the type and in the locations shown on the Contract Drawings and as ordered by the Engineer.

B. Related sections include the following:

1. Section 32 31 14 – Color Chain Link Fence and Gates

1.3 SUBMITTALS

A. Product Data: For each type of product indicated include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.

1. Fence and gate posts, rails, and fittings.
2. Chain-link fabric, reinforcements, and attachments.

B. Shop Drawings: Include layout of fence with dimensions, elevations, sections, details, and attachments to other work. Show accessories, hardware, and indicate finishes of all fence components.

1.4 ASSURANCE

A. Codes and Standards: All materials and construction methods shall conform to Form 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016 edition, unless otherwise specified herein and Chain Link Fence Manufacturer's Institute.

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.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FABRIC, POSTS, RAILS, AND HARDWARE

A. All material shall conform to Part 2 of Section 32 31 14 – Color Chain Link Fence with the following exceptions:

1. Mesh: Size: Helically wound and woven to height of 10 feet with 1 3/4" diamond mesh of 6 gauge core wire with a diameter of 0.192' and a breakload of 2170 lbs and 9-gauge core wire from 10 feet above the ground to the top of the backstop. Selvage of fabric knuckled at top and knuckled at bottom.
2. Pipe for backstop posts shall conform to ASTM F 1083, Intermediate Grade with minimum yield strength of 50,000 psi and have an outside diameter of 6-5/8 in.
3. Horizontal rails and roof members 1.9" OD (2.72 lbs per/ft).
4. Cement concrete for post footings shall be Class "C" and in accordance with Section 6.01 of Form 817.

PART 3 - EXECUTION

3.1 PREPARATION

A. Posts, with bottoms cut to the required grade, shall be welded to the base plates. All welding shall conform to the requirements of Subarticle 6.03.03-6 of CT DOT Form 817.

3.2 PLACING POSTS AND FENCE

A. All base plates shall provide full contact with the bearing surface when the posts are plumb and shall be caulked all around with a waterproof silicone rubber sealant. Expansion posts, with sliding pipe, shall be installed at the locations indicated on the plans. All rails shall be erected to produce a smooth, continuous appearance with posts placed vertically and with all rails parallel to the grade of the wall. The fabric shall be stretched tightly between end posts and securely fastened. The fabric shall be attached to the rails and line posts as shown on the Contract Drawings.

B. All posts shall have continuous horizontal braces at the top and the bottom. In addition, all end and corner posts shall be braced to the nearest line post with center brace rails. Outside sleeve-type top rail coupling shall be placed a maximum of 12 inches from posts.

C. All chain link fabric shall be fastened to the ball field side of the posts, unless directed otherwise by the Engineer. The fabric shall be properly stretched and securely fastened to the posts and between posts the top and bottom of the fabric shall be fastened to the horizontal braces as herein specified and approved by the Engineer.

D. The fabric shall be fastened to end and corner posts with tension bars and stretcher bar bands spaced at one-foot intervals.

E. All fabric shall be aligned so that the top row of the fabric mesh is tied to the top rails. The bottom row of the fabric mesh is tied to the bottom rail.

F. Fabric shall be fastened to line posts, rails, and braces with 9-gauge aluminum wire, spaced at 12-inch center, ties to be twisted.

END OF SECTION

SECTION 32 90 00 – PLANTING

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. Trees
2. Mulching

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

E. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

F. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product certificates for each type of product indicated.

C. Planting Schedule: Indicating anticipated planting dates for exterior plants.

D. Maintenance Instructions: See Contract Drawings.

1.5 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced landscaper to supervise, full-time, the Project site when planting is in progress.

B. All trees shall be inspected at the project site by the project landscape architect prior to being installed.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory.

1. Report to include suitability of topsoil for plant growth. State-recommended quantities of soil amendments (e.g. nitrogen, phosphorus, and potash) to be added to produce satisfactory topsoil.

D. Provide quantity, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

E. Form 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016 edition shall be used for materials compliance and execution of the work in this section.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sunscald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.

B. Handle planting stock by root ball.

C. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.

1.7 WARRANTY

A. Special Warranty: Installer's standard form in which Installer agrees to repair or replace plantings that fail in materials, quality of work, or growth within specified warranty period are specified below.

1. Failures include, but are not limited to, the following:

a. Death.
b. Unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, or incidents that are beyond Contractor's control.
c. Structural failures including plantings falling or blowing over.
d. Injury from deer or other wildlife which results in mortality of stock. Contractor is responsible for maintaining necessary structures to protect planted stock.

2. Warranty Periods from Date of Substantial Completion:

a. Trees: One year.

1.8 MAINTENANCE SERVICE

A. Initial Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.

1. Maintenance Period for Trees: 12 months from date of planting completion.

PART 2 - PRODUCTS

2.1 TREE MATERIAL

A. General: Furnish nursery-grown trees complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sunscald, injuries, abrasions, and disfigurement. Root ball shall be free of weeds and any other plant growth.

B. Root-Ball Depth: Furnish trees with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root balls with diameters less than 20 inches - depth not less than 65% of the diameter of the ball. Root balls with diameters of 20 inches and up - depth not less than 60% of the diameter of the ball. Root flare shall be visible before planting.

C. Provide balled and burlapped or container-grown trees.

2.2 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent and a maximum of 12 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay accumulations, and other extraneous materials which would impair plant growth.

a. Supplement with topsoil from off-site sources when quantities are insufficient.

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 7 decisiemens/m.

B. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

C. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials. Wood derivatives shall not include any portion of treated wood or construction debris.

D. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.5 FERTILIZER

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 10 percent phosphoric acid.

2.6 MULCHES

A. Organic Mulch: Ground or shredded undyed bark. Mulch shall be free of any treated or processed wood or construction debris and shall be aged a minimum of 3 months.

2.7 PLANTING SOIL MIX

A. Planting Soil Mix: Mix topsoil with the following soil amendments and fertilizers in the following quantities:

1. Ratio of Loose Compost to Topsoil by Volume: 1:4.
2. Ratio of Loose Peat to Topsoil by Volume: 1:4.
3. Ratio of Loose Wood Derivatives to Topsoil by Volume: 1:4.
4. Weight of Lime per 1000 Sq. Ft.: per PH test to achieve 6.0 – 6.5.

PART 3 - EXECUTION

3.1 PLANTING BED ESTABLISHMENT

A. Contractor to scarify planting area to loosen subgrade of planting beds to a minimum depth of 12 inches to assure that planting pits are free draining at a rate of 1.5" per hour or greater. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Spread soil amendments, per recommendations of approved soil test, or approved equal, to achieve required organic matter content (6%-20% by weight) and nutrient quantities.
2. Thoroughly blend soil amendments with existing soil and avoid over compaction of the beds through the use of motorized equipment.
3. Plant as indicated below.

B. Contractor to install 12" of specified topsoil over existing earthen base. Contractor to verify that planting pits are free draining at a rate of 1.5" per hour or greater. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Mix soil off-site before spreading; or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix. Soil amendments, per recommendations of approved soil test, to achieve required organic matter content (6%-20% by weight).
2. Thoroughly blend topsoil with existing soil and avoid over compaction of the beds through the use of motorized equipment.
3. Plant as indicated below.

C. Spread planting soil mix to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet. Avoid over compaction of soil through implementation of best management practices.

D. Finish Grading: Manually grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.2 TREES

A. Excavation of Pits and Trenches for Trees: Excavate circular pits with sides sloped inward. Install and compact approved soil mix at bottom of pit as shown on the Contract Drawings leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Manually scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter.
2. Assure that pit or trench is free draining at a rate of 1.5" per hour or greater. Make necessary improvements so plant does not sit in standing water or in a "bath" condition.

B. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.

C. Stock with Root Balls: Set trees plumb and in center of pit or trench with top of root ball flush with adjacent finish grades.

1. Balled and Burlapped: Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.

2. Container Grown: Carefully remove root ball from container without damaging root ball or plant.
3. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

D. Organic Mulching: Apply 4-inch average thickness of double shredded bark mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.

3.3 STAKING

A. Stake trees per Contract Drawings. Ensure guy wires are securely fastened to prevent wind damage to trunk and rootball.

3.4 TREE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

3.5 PLANTING BED MULCHING

A. Mulch backfilled surfaces of planting beds and other areas indicated.

1. Organic Mulch: Apply 4-inch average thickness of mulch, and finish level with adjacent finish grades. Do not place mulch against plant trunks or stems. Mulch should be no greater than one inch from plant stems.

3.6 PLANT MAINTENANCE

A. Tree Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings.

B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

C. Protect plants from wildlife damage such as deer or mice. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. Add additional topsoil if necessary to achieve finished grades if any settling takes place.

END OF SECTION

SECTION 32 92 00 – TURF AND GRASSES

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. Seeding.
2. Hydro-Mulching.

B. Related Sections

1. Section 31 10 00 – Site Clearing
2. Section 31 20 00 – Earth Moving

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Lawn: Any area seeded with grass seed or sloped with sod that will be maintained as mown grass.

C. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

E. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

F. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Source nursery for plant material.

C. Certification of grass seed.

1. Certification of each seed mixture shall be provided to the Owner at least 5 business days prior to installation.

D. Planting Schedule: Indicating anticipated planting dates for each type of planting shall be provided to the Owner at least 5 business days prior to installation.

1.5 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced landscaper full-time to supervise the Project site when seeding is in progress.

B. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory.

1. Report to include suitability of topsoil for plant growth. State-recommended quantities of soil amendments (e.g. nitrogen, phosphorus, and potash) to be added to produce satisfactory topsoil.

C. Workers: All workers 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.

D. Form 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016 edition shall be used for materials compliance and execution of the work in this section.

1.6 MAINTENANCE SERVICE

A. Initial Maintenance Service: Provide full maintenance by an experienced landscape installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:

1. Seeded Lawns: 90 days from date of Substantial Completion, seeding the area shall have greater than 95% viable coverage of grass.

a. When initial maintenance period has not elapsed before end of planting season, or if lawn is not fully established, the area shall be mulched with straw and maintenance continued next planting season.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed:

Species and cultivar	% by weight	% maximum purity	% maximum germination
American Kentucky bluegrass	10	98	80
Windward chewing fescue	30	98	85
Epic creeping red fescue	30	98	85
Wicked Perennial Ryegrass	15	97	90
Karma Perennial Ryegrass	15	97	90

The seed mixture is to be sown at 220 pounds per acre. The seed mixture is to have no noxious weeds. Other cultivars of perennial ryegrass, chewing fescue, creeping red fescue and Kentucky bluegrass may be substituted for the above listed cultivars with the approval of the Owner. However, the same number of species and cultivars with their percentage by weight in the mixtures must remain the same as specified above.

B. Provide fresh, clean, new-crop seed complying with established tolerances for germination and purity in accordance with the U.S. Department of Agriculture Rules and Regulations under the latest edition of the Federal Seed Act. Seed shall be mixed by the dealer and shall be delivered to the site in sealed containers that bear the Dealer's guaranteed analysis.

2.2 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent maximum of 7 percent organic material content; free of stones 1/2 inch or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay accumulations, and other extraneous materials which would impair plant growth.

    a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Off-site topsoil shall match the particle size characteristics and soil classification class of the on site topsoil per the appended soil analysis report.
    b. All topsoil from off site is to be screened material. Reuse of on-site topsoil requires screening of topsoil stockpiled on site and incorporation of soil amendments per testing results if needed.
    c. Submit laboratory analytical results to the owner for samples of the material, at least two (2) weeks prior to the import of material. Analytical results to include: extracable particle size analysis/soil textural analysis and classification, pH, organic matter, and basic nutrient analysis. One sample per 300CY is required. Inspecting engineer to test material delivered to site at his discretion. Test results completed by the engineer prevail. Contractor to modify soils, per engineer's testing agency recommendations, to meet the above specifications at his own expense.

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 7 decisiemens/m.

B. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

C. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials. Wood derivatives shall not include any portion of treated wood or construction debris.

D. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.5 FERTILIZER

A. All fertilizers shall be horticultural grade complete formula fertilizers and shall conform to the applicable State Fertilizer laws.

B. New seeded Areas: Fertilizer formula and application rate shall be as recommended by the soil testing laboratory base on soil test results.

2.6 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew-, weed-, and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

PART 3 - EXECUTION

3.1 SEED BED PREPARATION

A. Newly Graded Subgrades: Loosen subgrade with a subsoiler or other approved method to a minimum depth of 12 inches to achieve permeability not less than 1.5" per hour or 3' per day. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
2. Spread planting soil mix to a minimum depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

B. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil through deep-tine aeration or other approved method to a depth of at least 12 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to a homogeneous mixture of fine texture.

    a. Apply fertilizer directly to surface soil before loosening.

3. Remove stones larger than 1/2 inch in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

C. Finish Grading: The topsoil shall be fine graded to the grades as indicated in the Contract Documents. The fine grading shall be conducted with laser grading techniques. Very closely spaced grade staking and string lines will not be accepted. The fine grading technique must be submitted by the Contractor to the Owner or the Owner's designated representative for review and approval at least two (2) weeks before fine grading has started. Fine grading must result in a maximum tolerance form proposed grade of ± ½" with no areas where water may puddle, pond, or flow in an unintended channel. Any additional topsoil needed to produce the required grading will be supplied and placed by the Contractor.

    All equipment used to install, grade and fine grade topsoil shall be low ground pressure equipment suitable for the installation. Contractor is to submit for approval all equipment intended for use for the project. Large loaders, bulldozers, and earthmoving equipment will not be allowed on the topsoil during placement or after tilling. Equipment weighing > 16,000 pounds and equipment with high ground pressure contact will not be allowed on the landscaped areas after topsoil has been placed or tilled without the approval of the Engineer.

D. Moisten prepared lawn areas before seeding if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

E. Before seeding, restore areas if eroded or otherwise disturbed after finish grading.

3.2 SEEDING

A. Furnish and apply seed to the topsoil with a mechanical seeder at a rate as indicated on the seed label and/or contract document.

B. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

C. Hydro seeding is acceptable.

D. Rake lawn seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

E. Drag or roll the surface of specialty seed areas to incorporate the seed into the top 1/4 inch to 1/2 inch of soil. A seed drill is acceptable.

F. Protect all seeded areas by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

3.3 MAINTENANCE

A. Lawn: Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.

1. Mow lawn as soon as top growth reaches a height of 4 inches. Lawn shall be cut to a 1-1/2" height. Contractor shall continue to mow every 5 days thereafter from the initial mowing to maintain a 1-1/2" height.

B. Fertilization

1. The contractor shall be responsible for fertilizing all seeded and sod areas during the maintenance period prior to final acceptance. Fertilizers shall be granular in composition and contain 40% or more of the nitrogen in a slow or controlled-release form. The exact composition of the fertilizer shall be determined on time of year, soil testing results and good industry practices. The Contractor shall sweep any fertilizer that has been spread on walks and drives back onto the lawns or field. The Contractor shall notify the Director of Public Works or his designee prior to spreading fertilizer so that the irrigation schedule can be adjusted to allow for the fertilizer application.

C. Irrigation

1. A permanent irrigation system does not existing, and is not proposed as part of this project. The contractor, by whatever means they see fit, shall provide temporary irrigation systems to establish and maintain healthy lawn until the end of the specified maintenance period.

2. Irrigation shall be on an as needed basis determined by the weather and soil moisture probes installed. Contractor is ensure the irrigation system is in working order prior to the installation of seeding so that the system may be used during the maintenance period.

3. Irrigation shall be run in the early morning.

3.4 SATISFACTORY ESTABLISHMENT

A. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 95 percent over any 10 sq. ft. and bare spots not exceeding 3 by 3 inches.

B. Use specified materials to reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

END OF SECTION

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 yard drains.
3. Underground stormwater chambers.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For manholes, catch basins, yard drains, flared end sections, hydrodynamic separators, outlet structures and stormwater chambers. Include plans, elevations, sections, details, and manhole frames and covers and catch basin frames and grates.

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. Workers: all workers 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 817 - State of Connecticut Department of Transportation "Specifications for Roads, Bridges, Facilities and Incidental Construction" 2016 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 YARD DRAINS

A. Precast Concrete Yard Drains and Concrete Galleries: 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 STORMWATER CHAMBER INSTALLATION

A. General: Install manholes and stormwater chamber, complete with appurtenances and accessories indicated.

B. Install precast concrete drainage structures sections with sealants according to ASTM C 891.

3.4 YARD DRAIN INSTALLATION

A. Set frames and grates to elevations indicated.

3.5 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.

3.6 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

APPENDIX A
ENVIRONMENTAL SOIL INVESTIGATION

MILONE & MACBROOM

July 30, 2019

Mr. Daniel M. Watson, Director of School Facilities
Greenwich Public Schools
290 Greenwich Avenue
Greenwich, CT 06830

RE: Environmental Soil Investigation at Hamilton Avenue School
Greenwich, Connecticut
MMI #5062-08-04

Dear Mr. Watson:

Milone & MacBroom, Inc. (MMI) conducted a limited investigation of information and files pertaining to past construction activities associated with the playing field at the Hamilton Avenue School athletic field located at 184 Hamilton Avenue in Greenwich, Connecticut. This work was performed in an effort to determine if, and potentially when, additional fill material was imported and/or placed at the field. Concurrently with this investigation, MMI also collected soil samples from 20 locations throughout the field area. This work was completed in an effort to inform the design process for the proposed field improvements.

Background Investigation Summary

The background research on the history of field construction included a review of historical aerial photography, a request to review pertinent town documentation, and in-person interviews of staff at the Town Hall of Greenwich. The following departments were contacted and interviewed: Department of Public Works (Building Inspection); Planning & Zoning Department (includes Land Use and Environmental Affairs); Engineering Department; Assessor and Clerk Offices; and Parks & Recreation.

None of the town departments had any documentation pertaining to the construction of the playing field with the exception of the Planning and Zoning and Engineering offices. Both offices had proposed school improvement and addition plans dated 2004-2006 that seemingly did not involve changes to the playing field.

The Engineering Department also had an August 29, 2005 Grading and Drainage Plan designed by Swanke Hayden Connell Architects for Langan Engineering and Environmental Services. This plan showed proposed storm drainage piping throughout the southern portion of the field and included a brief summary of geologic descriptions of the material from grade to approximately 69 inches below grade. The geologic descriptions came from observations of two deep test pits and one percolation test conducted on the southern portion of the field. The material was generally described on the plan as topsoil underlain by silty loam, then sand and silt with fractured rock.

There was no information on the plan suggesting that the soil was imported from another area or source.

The in-person interviews with Town Hall staff resulted in no new or additional information.

Historical aerials from Connecticut Environmental Conditions Online (CT ECO) covering the following years were reviewed: 1934, 1965, 1970, 1985, 1990, 1996, 2004, 2006, 2008, and 2010. The aerial photography review indicated that the field had been constructed by 1965 and appeared grass-covered until the 2006 photo. The 2006 photo showed that approximately 75 percent of the field had been stripped of vegetation. It was also evident in this photo that the school building was under construction. Presumably the topsoil in the southern portions of the field had been removed to facilitate the reconstruction of the school and possibly the installation of the geothermal wells. The 2008 and forward photographs showed the field grass covered and the school building as it appears in the present.

Soil Sampling Method

On June 27, 2019, MMI personnel collected a total of 25 soil samples from 20 borings at the athletic field (see Figure 1) using a hand auger. Ten soil samples were collected from the northern portion of the field at a depth from grade to 8 inches below grade (sample locations A1 through C3). An additional five soil samples representing the topsoil only (the upper 4 to 6 inches of the soil profile) were collected from five of these 10 borings (A1, A2, A3, B2, and B3). The remaining 10 soil samples were collected from the upper 12 to 24 inches of soil at borings located on the southern portion of the field (sample locations D1 through G1).

MMI personnel used clean hand tools to collect each sample. The soil samples were placed into laboratory-supplied glassware and delivered to Complete Environmental Testing, Inc. (CET), a State of Connecticut certified laboratory, for analysis that same day. The soil samples were analyzed for the following parameters:

- Polychlorinated biphenyls (PCBs) by the Environmental Protection Agency (EPA) 8082A Method
- Connecticut Department of Energy & Environmental Protection (CTDEEP) list of 15 metals
- Extractable total petroleum hydrocarbons by the Connecticut ETPH Method
- Polynuclear aromatic hydrocarbons (PAHs) by the EPA 8270D Method
- Organochlorine pesticides by EPA 8081B Method (topsoil only)

Soil Sampling Results

In general, the soil encountered at the athletic field consisted of a thin layer (approximately 4 to 6 inches) of fine-to-medium, dark-brown-to-black sandy loam underlain by gravelly fill. The fill layer generally consisted of medium to coarse light brown sand and subangular gravel but also contained traces of concrete, asphalt, and brick.

The laboratory results indicated the following:

- No PCBs were detected in any of the samples.
- The soil sample collected from the eastern-central portion of the field, C3 (0 to 8"), had a detection of ETPH of 66 milligrams per kilogram (mg/kg), which is well below the CTDEEP Residential Direct Exposure Criteria (RDEC) for ETPH of 500 mg/kg. No other samples had detections of ETPH above the laboratory reporting limit.
- Several metals were detected in all the soil samples at trace concentrations, which is likely indicative of naturally occurring levels, with the exception of arsenic. Generally, arsenic was detected in the soil samples at concentrations below and approaching the CTDEEP RDEC of 10 mg/kg; however, one soil sample, D2 (0 to 12") (central-southern portion of the field), contained arsenic at 11 mg/kg, which exceeded the RDEC.
- Low concentrations of several PAH compounds were detected in nine of the soil samples (central and southern portions of the field). None exceeded CTDEEP criteria.
- All five topsoil samples collected from the northern portion of the field contained one or more of the following five organochlorine pesticide constituents: 4,4 DDD, 4,4 DDE, 4,4 DDT, dieldrin, and/or chlordane.
    - The CTDEEP currently only specifies criteria for dieldrin and chlordane but has in the past suggested criteria for DDD, DDE, and DDT.
    - The topsoil sample collected at location A1 contained chlordane at 540 mg/kg (RDEC is 490 mg/kg).
    - The topsoil sampled collected at location B3 contained dieldrin at 170 mg/kg (RDEC is 38 mg/kg).

Discussion of Results

It appears that at least some portions of the playing field were disturbed during school renovation work in the early 2000s. The presence of PAH and ETPH compounds in the southern portion of the site may be a result of the use of fill from other portions of the property during the construction activities, and based upon observations made during the sampling activities, these compounds may be the result of the various yet minor presences of asphalt fragments.

The sample results also indicate the presence of organochlorine pesticides in the topsoil. These types of pesticides were generally discontinued in the 1970s and 1980s; however, they are still commonly detected in topsoil, especially topsoil that has originated at farms or orchards. The noted concentrations were above generally accepted limits for residential land use at sample locations A2 and D3. The CTDEEP has issued guidance on remediation of organochlorine pesticides (attached), and that guidance generally involves either the removal or the blending of affected topsoil with other soil so that the overall concentrations are decreased. The topsoil in the southern portion of the field was not sampled although as noted above, this portion of the field was disturbed during the construction activities in the early 2000s.

MMI understands that the Greenwich school system does not currently utilize synthetic pesticides on the playing field. The types of pesticides detected are routinely found in soil even after several decades from their last application. The presence therefore does not necessarily constitute evidence of an off-site origin of the topsoil.

The proposed field improvements should consider either the removal or replacement of the topsoil in the northern portion of the field or the management of that topsoil in accordance with the CTDEEP guidance document. Preliminary plans call for the leveling of the field, including the removal of a certain quantity

of soil from the southern portion and the slight raising of grade in the northern portion of the field. If surplus material is generated, the removed soil may not meet the CTDEEP's definition of clean fill, and off-site disposal may incur an added cost. If the material is all reused on site, blending or amendment of the existing topsoil may be necessary to improve the overall quality of the topsoil and to reduce the concentrations of the noted compounds.

The limited data set suggests that blending the topsoil may be a viable option for decreasing the overall concentrations of pesticides. As stated above, only two of the five sampled locations contained concentrations of pesticides greater than the recommended values. A simple averaging of the five sets of results suggests that blending may achieve final concentrations less than the recommended values, and if the soil is amended with additional organic matter to improve the overall quality, then lower concentrations may be achieved. If Greenwich Public Schools prefers instead to ensure that the topsoil at the newly constructed fields is absolutely free of organochlorine pesticides, then the topsoil will need to be stripped and disposed of off site and new topsoil imported. The total cost of this approach would likely exceed $100,000, and while it would address the playing field, it would not address other areas of the school grounds that could potentially contain similar residual pesticide concentrations.

Very truly yours,

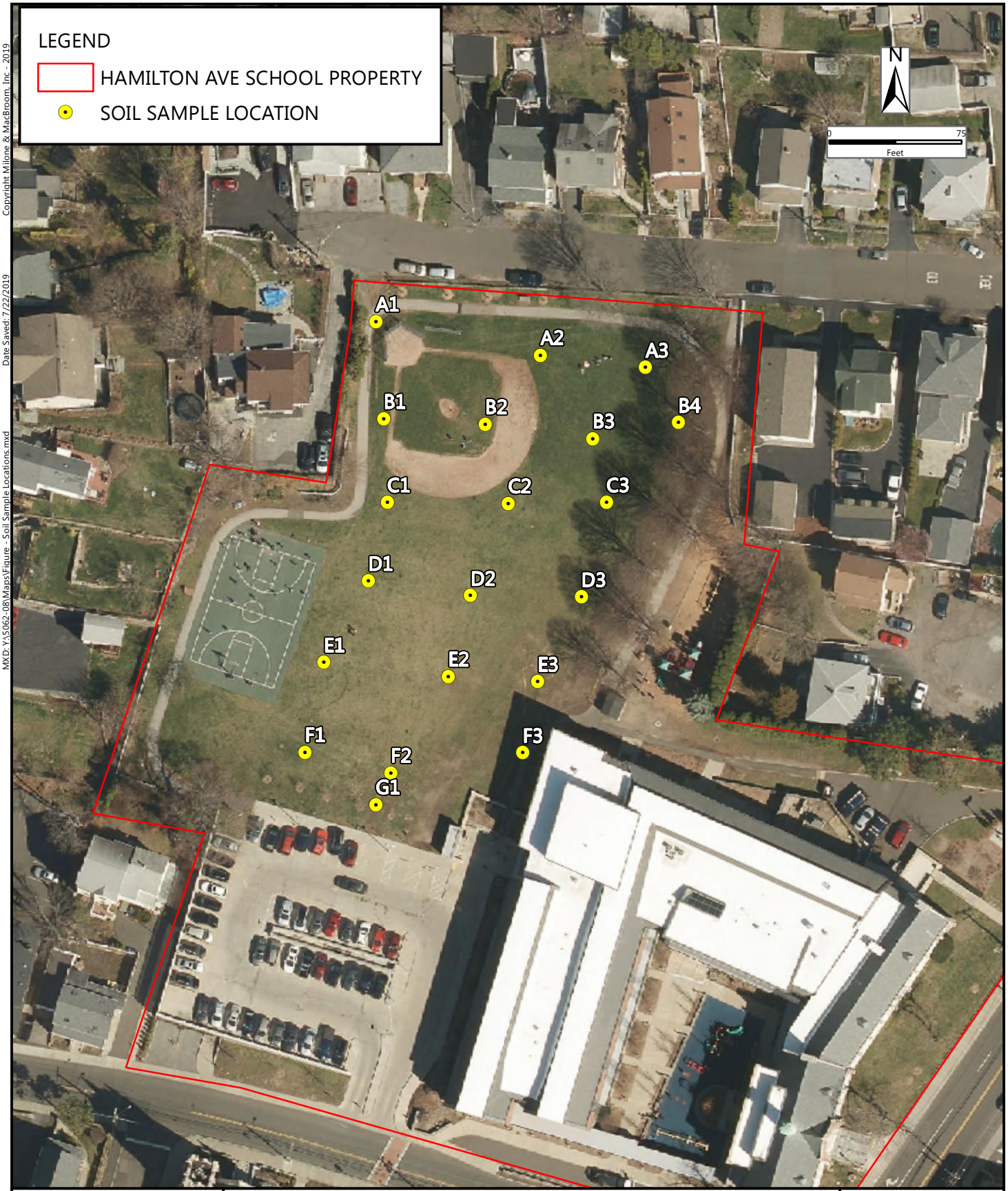
MILONE & MACBROOM, INC.

Scott G. Bristol, LEP, PG
Associate, Manager of Environmental Services

Enclosure

5062-08-04-jl2219-ltr.docx

SOIL SAMPLE LOCATION FIGURE



Date Saved: 7/22/2019

MXD: Y:\5062-08\Maps\Figure - Soil Sample Locations.mxd

MILONE & MACBROOM
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
WWW.MMINC.COM

SOIL SAMPLE MAP

HAMILTON AVE SCHOOL ENVIRONMENTAL SOIL INVESTIGATION
GREENWICH PUBLIC SCHOOLS
184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

SCALE	1 " = 75 '
DATE	7/22/2019
PROJ. NO.	5062-08-04

FIGURE

TABLE

Summary Table of Soil Results
Hamilton Ave School
Greenwich, Connecticut

Samples Collected on June 27, 2019

Sample ID		A1	A1 Topsoil	A2	A2 Topsoil	A3
Parameter	**RDEC**	**0 - 8"**	**0 - 4"**	**0 - 8"**	**0 - 6"**	**0 - 8"**
CT-ETPH by CT ETPH Method (mg/kg)						
ETPH	500	ND<60	--	ND<62	--	ND<60
Connecticut 15 Metals List by the EPA 6010C Method (mg/kg)						
Antimony	27	ND<2.2	--	ND<2.5	--	ND<2.3
Arsenic	10	3.3	--	6	--	6.1
Barium	4,700	22	--	98	--	96
Beryllium	2	ND<1.1	--	ND<1.2	--	ND<1.2
Cadmium	34	ND<0.56	--	ND<0.62	--	ND<0.58
Chromium	NE	10	--	30	--	35
Copper	2,500	8.3	--	18	--	22
Lead	400	17	--	42	--	46
Nickel	1,400	4.9	--	17	--	19
Selenium	340	1.9	--	5.1	--	5.5
Silver	340	ND<2.2	--	ND<2.5	--	ND<2.3
Thallium	5	ND<2.2	--	ND<2.5	--	ND<2.3
Vanadium	470	16	--	41	--	39
Zinc	20,000	35	--	70	--	72
Total Mercury by the EPA 7471B Method (mg/kg)						
Mercury	20	ND<0.14	--	ND<0.16	--	ND<0.14
Pesticides by the EPA 8081B Method (ug/Kg)						
4,4-DDD	1,800 (see note 1)	--	57	--	33	--
4,4-DDE	1,800 (see note 1)	--	87	--	1,800	--
4,4-DDT	1,800 (see note 1)	--	63	--	320	--
4,4-Methoxychlor	340,000	--	ND<6.0	--	ND<6.2	--
alachlor	7,700	--	ND<60	--	ND<62	--
Aldrin	NA	--	ND<6.0	--	ND<6.2	--
alpha-BHC	NA	--	ND<6.0	--	ND<6.2	--
beta-BHC	NA	--	ND<6.0	--	ND<6.2	--
Chlordane	490	--	540	--	ND<37	--
Delta-BHC	NA	--	ND<6.0	--	ND<6.2	--
Dieldrin	38	--	ND<1.2	--	ND<1.2	--
Endosulfan I	NA	--	ND<6.0	--	ND<6.2	--
Endosulfan II	NA	--	ND<6.0	--	ND<6.2	--
Endosulfan sulfate	NA	--	ND<6.0	--	ND<6.2	--
Endrin	20,000	--	ND<6.0	--	ND<6.2	--
Endrin aldehyde	NA	--	ND<6.0	--	ND<6.2	--
Endrin ketone	NA	--	ND<6.0	--	ND<6.2	--
Gamma-BHC	20,000	--	ND<6.0	--	ND<6.2	--
Heptachlor	140	--	ND<6.0	--	ND<6.2	--
Heptachlor epoxide	67	--	ND<6.0	--	ND<6.2	--
Toxaphene	560	--	ND<120	--	ND<120	--
PCBs by the EPA 8082A Method (mg/kg)						
PCB-1016	1	ND<0.12	--	ND<0.12	--	ND<0.12
PCB-1221	1	ND<0.12	--	ND<0.12	--	ND<0.12
PCB-1232	1	ND<0.12	--	ND<0.12	--	ND<0.12
PCB-1242	1	ND<0.12	--	ND<0.12	--	ND<0.12
PCB-1248	1	ND<0.12	--	ND<0.12	--	ND<0.12
PCB-1254	1	ND<0.12	--	ND<0.12	--	ND<0.12
PCB-1260	1	ND<0.12	--	ND<0.12	--	ND<0.12
PCB-1262	1	ND<0.12	--	ND<0.12	--	ND<0.12
PCB-1268	1	ND<0.12	--	ND<0.12	--	ND<0.12
PAHs by the EPA 8270D Method (ug/Kg)						
Acenaphthene	1,000,000 (see note 1)	ND<360	--	ND<370	--	ND<360
Acenaphthylene	1,000,000	ND<360	--	ND<370	--	ND<360
Anthracene	1,000,000	ND<360	--	ND<370	--	ND<360
Benzo[a]anthracene	1,000	ND<360	--	ND<370	--	ND<360
Benzo[a]pyrene	1,000	ND<360	--	ND<370	--	ND<360
Benzo[b]fluoranthene	1,000	ND<360	--	ND<370	--	ND<360
Benzo[g,h,i]perylene	8,400 (see note 1)	ND<360	--	ND<370	--	ND<360
Benzo[k]fluoranthene	8,400	ND<360	--	ND<370	--	ND<360
Chrysene	84,000 (see note 1)	ND<360	--	ND<370	--	ND<360
Dibenz[a,h]anthracene	1,000 (see note 1)	ND<360	--	ND<370	--	ND<360
Fluoranthene	1,000,000	ND<360	--	ND<370	--	ND<360
Fluorene	1,000,000	ND<360	--	ND<370	--	ND<360
Indeno[1,2,3-cd]pyrene	1,000 (see note 1)	ND<360	--	ND<370	--	ND<360
2-Methyl Naphthalene	270,000 (see note 1)	ND<360	--	ND<370	--	ND<360
Phenanthrene	1,000,000	ND<360	--	ND<370	--	ND<360
Pyrene	1,000,000	ND<360	--	ND<370	--	ND<360
Naphthalene	1,000,000	ND<360	--	ND<370	--	ND<360

Notes:

CT ETPH	Connecticut (CT) Extractable Total Petroleum Hydrocarbons
PCBs	Polychlorinated biphenyls
PAHs	Polycyclic aromatic hydrocarbons
RDEC	Residential Direct Exposure Criteria
ug/kg	Micrograms per kilogram
mg/kg	Milligrams per kilogram
ND<60	Not detected above indicated laboratory reporting limit
NA	Not applicable
NE	Not established
---	Not analyzed
Note 1	Suggested CTDEEP criteria for reference purposes.

Summary Table of Soil Results
Hamilton Ave School
Greenwich, Connecticut

Samples Collected on June 27, 2019

Sample ID		A3 Topsoil	B1	B2	B2 Topsoil	B3	B3 Topsoil
Parameter	**RDEC**	**0 - 6"**	**0 - 8"**	**0 - 8"**	**0 - 6"**	**0 - 8"**	**0 - 6"**
CT-ETPH by CT ETPH Method (mg/kg)							
ETPH	500	--	ND<63	ND<57	--	ND<60	--
Connecticut 15 Metals List by the EPA 6010C Metho							
Antimony	27	--	ND<2.3	ND<2.3	--	ND<2.4	--
Arsenic	10	--	7.1	5.2	--	6.5	--
Barium	4,700	--	60	39	--	100	--
Beryllium	2	--	ND<1.2	ND<1.1	--	ND<1.2	--
Cadmium	34	--	ND<0.59	ND<0.56	--	ND<0.59	--
Chromium	NE	--	19	10	--	42	--
Copper	2,500	--	16	11	--	22	--
Lead	400	--	46	8.5	--	56	--
Nickel	1,400	--	10	7.9	--	19	--
Selenium	340	--	2.8	2.6	--	4.9	--
Silver	340	--	ND<2.3	ND<2.3	--	ND<2.4	--
Thallium	5	--	ND<2.3	ND<2.3	--	ND<2.4	--
Vanadium	470	--	22	15	--	43	--
Zinc	20,000	--	60	27	--	70	--
Total Mercury by the EPA 7471B Method (mg/kg)							
Mercury	20	--	ND<0.15	ND<0.14	--	ND<0.16	--
Pesticides by the EPA 8081B Method (ug/Kg)							
4,4-DDD	1,800 (see note 1)	26	--	--	ND<5.7	--	1,100
4,4-DDE	1,800 (see note 1)	560	--	--	91	--	6,500
4,4-DDT	1,800 (see note 1)	120	--	--	48	--	8,500
4,4-Methoxychlor	340,000	ND<5.9	--	--	ND<5.7	--	ND<6.0
alachlor	7,700	ND<59	--	--	ND<57	--	ND<60
Aldrin	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
alpha-BHC	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
beta-BHC	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
Chlordane	490	ND<36	--	--	ND<34	--	ND<36
Delta-BHC	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
Dieldrin	38	ND<1.2	--	--	ND<1.1	--	170
Endosulfan I	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
Endosulfan II	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
Endosulfan sulfate	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
Endrin	20,000	ND<5.9	--	--	ND<5.7	--	ND<6.0
Endrin aldehyde	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
Endrin ketone	NA	ND<5.9	--	--	ND<5.7	--	ND<6.0
Gamma-BHC	20,000	ND<5.9	--	--	ND<5.7	--	ND<6.0
Heptachlor	140	ND<5.9	--	--	ND<5.7	--	ND<6.0
Heptachlor epoxide	67	ND<5.9	--	--	ND<5.7	--	ND<6.0
Toxaphene	560	ND<120	--	--	ND<110	--	ND<120
PCBs by the EPA 8082A Method (mg/kg)							
PCB-1016	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PCB-1221	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PCB-1232	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PCB-1242	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PCB-1248	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PCB-1254	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PCB-1260	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PCB-1262	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PCB-1268	1	--	ND<0.13	ND<0.11	--	ND<0.12	--
PAHs by the EPA 8270D Method (ug/Kg)							
Acenaphthene	1,000,000 (see note 1)	--	ND<380	ND<340	--	ND<360	--
Acenaphthylene	1,000,000	--	ND<380	ND<340	--	ND<360	--
Anthracene	1,000,000	--	ND<380	ND<340	--	ND<360	--
Benzo[a]anthracene	1,000	--	ND<380	ND<340	--	ND<360	--
Benzo[a]pyrene	1,000	--	ND<380	ND<340	--	ND<360	--
Benzo[b]fluoranthene	1,000	--	ND<380	ND<340	--	ND<360	--
Benzo[g,h,i]perylene	8,400 (see note 1)	--	ND<380	ND<340	--	ND<360	--
Benzo[k]fluoranthene	8,400	--	ND<380	ND<340	--	ND<360	--
Chrysene	84,000 (see note 1)	--	ND<380	ND<340	--	ND<360	--
Dibenz[a,h]anthracene	1,000 (see note 1)	--	ND<380	ND<340	--	ND<360	--
Fluoranthene	1,000,000	--	ND<380	ND<340	--	ND<360	--
Fluorene	1,000,000	--	ND<380	ND<340	--	ND<360	--
Indeno[1,2,3-cd]pyrene	1,000 (see note 1)	--	ND<380	ND<340	--	ND<360	--
2-Methyl Naphthalene	270,000 (see note 1)	--	ND<380	ND<340	--	ND<360	--
Phenanthrene	1,000,000	--	ND<380	ND<340	--	ND<360	--
Pyrene	1,000,000	--	ND<380	ND<340	--	ND<360	--
Naphthalene	1,000,000	--	ND<380	ND<340	--	ND<360	--

Notes:

CT ETPH	Connecticut (CT) Extractable Total Petroleum Hydrocarbons
PCBs	Polychlorinated biphenyls
PAHs	Polycyclic aromatic hydrocarbons
RDEC	Residential Direct Exposure Criteria
ug/kg	Micrograms per kilogram
mg/kg	Milligrams per kilogram
ND<60	Not detected above indicated laboratory reporting limit
NA	Not applicable
NE	Not established
---	Not analyzed
Note 1	Suggested CTDEEP criteria for reference purposes.

Summary Table of Soil Results
Hamilton Ave School
Greenwich, Connecticut

Samples Collected on June 27, 2019

Sample ID		B4	C1	C2	C3	D1	D2	D3
Parameter	**RDEC**	**0 - 8"**	**0 - 8"**	**0 - 8"**	**0 - 8"**	**0 - 13"**	**0 - 12"**	**0 - 12"**
CT-ETPH by CT ETPH Method (mg/kg)								
ETPH	500	ND<54	ND<60	ND<58	66	ND<54	ND<56	ND<58
Connecticut 15 Metals List by the EPA 6010C Metho								
Antimony	27	ND<2.2	ND<2.4	ND<2.2	ND<2.2	ND<2.1	ND<2.1	ND<2.3
Arsenic	10	6.6	9.6	8.3	7	7.4	11	9.5
Barium	4,700	92	140	120	120	230	140	130
Beryllium	2	ND<1.1	ND<1.2	ND<1.1	ND<1.1	ND<1.0	ND<1.0	ND<1.1
Cadmium	34	ND<0.55	ND<0.61	ND<0.56	ND<0.56	ND<0.51	ND<0.52	ND<0.57
Chromium	NE	28	39	34	33	59	39	37
Copper	2,500	22	27	25	28	31	27	25
Lead	400	82	100	86	82	71	110	97
Nickel	1,400	16	21	18	20	28	26	19
Selenium	340	4.3	5.4	4	3.9	4.6	4.7	4.2
Silver	340	ND<2.2	ND<2.4	ND<2.2	ND<2.2	ND<2.1	ND<2.1	ND<2.3
Thallium	5	ND<2.2	ND<2.4	ND<2.2	ND<2.2	ND<2.1	ND<2.1	ND<2.3
Vanadium	470	35	41	35	38	50	40	39
Zinc	20,000	120	100	100	130	86	100	97
Total Mercury by the EPA 7471B Method (mg/kg)								
Mercury	20	ND<0.15	ND<0.15	ND<0.15	ND<0.14	ND<0.14	ND<0.15	ND<0.14
Pesticides by the EPA 8081B Method (ug/Kg)								
4,4-DDD	1,800 (see note 1)	--	--	--	--	--	--	--
4,4-DDE	1,800 (see note 1)	--	--	--	--	--	--	--
4,4-DDT	1,800 (see note 1)	--	--	--	--	--	--	--
4,4-Methoxychlor	340,000	--	--	--	--	--	--	--
alachlor	7,700	--	--	--	--	--	--	--
Aldrin	NA	--	--	--	--	--	--	--
alpha-BHC	NA	--	--	--	--	--	--	--
beta-BHC	NA	--	--	--	--	--	--	--
Chlordane	490	--	--	--	--	--	--	--
Delta-BHC	NA	--	--	--	--	--	--	--
Dieldrin	38	--	--	--	--	--	--	--
Endosulfan I	NA	--	--	--	--	--	--	--
Endosulfan II	NA	--	--	--	--	--	--	--
Endosulfan sulfate	NA	--	--	--	--	--	--	--
Endrin	20,000	--	--	--	--	--	--	--
Endrin aldehyde	NA	--	--	--	--	--	--	--
Endrin ketone	NA	--	--	--	--	--	--	--
Gamma-BHC	20,000	--	--	--	--	--	--	--
Heptachlor	140	--	--	--	--	--	--	--
Heptachlor epoxide	67	--	--	--	--	--	--	--
Toxaphene	560	--	--	--	--	--	--	--
PCBs by the EPA 8082A Method (mg/kg)								
PCB-1016	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1221	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1232	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1242	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1248	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1254	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1260	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1262	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1268	1	ND<0.11	ND<0.12	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PAHs by the EPA 8270D Method (ug/Kg)								
Acenaphthene	1,000,000 (see note 1)	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
Acenaphthylene	1,000,000	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
Anthracene	1,000,000	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
Benzo[a]anthracene	1,000	ND<330	ND<370	ND<350	ND<340	ND<320	470	ND<350
Benzo[a]pyrene	1,000	ND<330	ND<370	ND<350	380	ND<320	520	ND<350
Benzo[b]fluoranthene	1,000	ND<330	ND<370	ND<350	450	ND<320	640	ND<350
Benzo[g,h,i]perylene	8,400 (see note 1)	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
Benzo[k]fluoranthene	8,400	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
Chrysene	84,000 (see note 1)	ND<330	ND<370	ND<350	ND<340	ND<320	390	ND<350
Dibenz[a,h]anthracene	1,000 (see note 1)	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
Fluoranthene	1,000,000	ND<330	490	ND<350	480	390	980	390
Fluorene	1,000,000	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
Indeno[1,2,3-cd]pyrene	1,000 (see note 1)	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
2-Methyl Naphthalene	270,000 (see note 1)	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350
Phenanthrene	1,000,000	ND<330	ND<370	ND<350	ND<340	ND<320	390	ND<350
Pyrene	1,000,000	ND<330	410	ND<350	420	350	760	ND<350
Naphthalene	1,000,000	ND<330	ND<370	ND<350	ND<340	ND<320	ND<340	ND<350

Notes:

CT ETPH	Connecticut (CT) Extractable Total Petroleum Hydrocarbons
PCBs	Polychlorinated biphenyls
PAHs	Polycyclic aromatic hydrocarbons
RDEC	Residential Direct Exposure Criteria
ug/kg	Micrograms per kilogram
mg/kg	Milligrams per kilogram
ND<60	Not detected above indicated laboratory reporting limit
NA	Not applicable
NE	Not established
---	Not analyzed
Note 1	Suggested CTDEEP criteria for reference purposes.

Summary Table of Soil Results
Hamilton Ave School
Greenwich, Connecticut

Samples Collected on June 27, 2019

Sample ID		E1	E2	E3	F1	F2	F3	G1
Parameter	**RDEC**	**0 - 24"**	**0 - 24"**	**0 - 12"**	**0 - 24"**	**0 - 24"**	**0 - 24"**	**0 - 24"**
CT-ETPH by CT ETPH Method (mg/kg)								
ETPH	500	ND<53	ND<54	ND<54	ND<56	ND<54	ND<56	ND<55
Connecticut 15 Metals List by the EPA 6010C Metho								
Antimony	27	ND<2.1	ND<2.1	ND<2.2	ND<2.1	ND<2.0	ND<2.1	ND<2.2
Arsenic	10	6.1	5.7	7	9.2	7.6	8.2	6.4
Barium	4,700	400	180	160	190	190	180	190
Beryllium	2	ND<1.1	ND<1.1	ND<1.1	ND<1.1	ND<1.0	ND<1.0	ND<1.1
Cadmium	34	ND<0.53	ND<0.54	ND<0.55	ND<0.53	ND<0.50	ND<0.52	ND<0.55
Chromium	NE	69	49	43	46	52	48	49
Copper	2,500	25	28	24	36	29	33	32
Lead	400	26	42	73	110	71	87	76
Nickel	1,400	34	24	22	27	26	26	26
Selenium	340	4.5	4.3	2.7	2.8	2.6	3.6	2.9
Silver	340	ND<2.1	ND<2.1	ND<2.2	ND<2.1	ND<2.0	ND<2.1	ND<2.2
Thallium	5	ND<2.1	ND<2.1	ND<2.2	ND<2.1	ND<2.0	ND<2.1	ND<2.2
Vanadium	470	60	42	44	47	46	46	47
Zinc	20,000	67	76	80	100	87	91	91
Total Mercury by the EPA 7471B Method (mg/kg)								
Mercury	20	ND<0.14	ND<0.14	ND<0.14	ND<0.15	ND<0.13	ND<0.15	ND<0.14
Pesticides by the EPA 8081B Method (ug/Kg)								
4,4-DDD	1,800 (see note 1)	--	--	--	--	--	--	--
4,4-DDE	1,800 (see note 1)	--	--	--	--	--	--	--
4,4-DDT	1,800 (see note 1)	--	--	--	--	--	--	--
4,4-Methoxychlor	340,000	--	--	--	--	--	--	--
alachlor	7,700	--	--	--	--	--	--	--
Aldrin	NA	--	--	--	--	--	--	--
alpha-BHC	NA	--	--	--	--	--	--	--
beta-BHC	NA	--	--	--	--	--	--	--
Chlordane	490	--	--	--	--	--	--	--
Delta-BHC	NA	--	--	--	--	--	--	--
Dieldrin	38	--	--	--	--	--	--	--
Endosulfan I	NA	--	--	--	--	--	--	--
Endosulfan II	NA	--	--	--	--	--	--	--
Endosulfan sulfate	NA	--	--	--	--	--	--	--
Endrin	20,000	--	--	--	--	--	--	--
Endrin aldehyde	NA	--	--	--	--	--	--	--
Endrin ketone	NA	--	--	--	--	--	--	--
Gamma-BHC	20,000	--	--	--	--	--	--	--
Heptachlor	140	--	--	--	--	--	--	--
Heptachlor epoxide	67	--	--	--	--	--	--	--
Toxaphene	560	--	--	--	--	--	--	--
PCBs by the EPA 8082A Method (mg/kg)								
PCB-1016	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1221	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1232	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1242	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1248	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1254	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1260	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1262	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PCB-1268	1	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11
PAHs by the EPA 8270D Method (ug/Kg)								
Acenaphthene	1,000,000 (see note 1)	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
Acenaphthylene	1,000,000	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
Anthracene	1,000,000	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
Benzo[a]anthracene	1,000	ND<320	ND<320	ND<330	ND<340	360	390	ND<330
Benzo[a]pyrene	1,000	ND<320	ND<320	ND<330	ND<340	ND<320	340	ND<330
Benzo[b]fluoranthene	1,000	ND<320	ND<320	ND<330	ND<340	360	380	ND<330
Benzo[g,h,i]perylene	8,400 (see note 1)	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
Benzo[k]fluoranthene	8,400	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
Chrysene	84,000 (see note 1)	ND<320	ND<320	ND<330	ND<340	ND<320	340	ND<330
Dibenz[a,h]anthracene	1,000 (see note 1)	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
Fluoranthene	1,000,000	ND<320	ND<320	390	ND<340	530	630	380
Fluorene	1,000,000	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
Indeno[1,2,3-cd]pyrene	1,000 (see note 1)	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
2-Methyl Naphthalene	270,000 (see note 1)	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330
Phenanthrene	1,000,000	ND<320	ND<320	ND<330	ND<340	ND<320	420	ND<330
Pyrene	1,000,000	ND<320	ND<320	350	ND<340	440	530	ND<330
Naphthalene	1,000,000	ND<320	ND<320	ND<330	ND<340	ND<320	ND<340	ND<330

Notes:

CT ETPH	Connecticut (CT) Extractable Total Petroleum Hydrocarbons
PCBs	Polychlorinated biphenyls
PAHs	Polycyclic aromatic hydrocarbons
RDEC	Residential Direct Exposure Criteria
ug/kg	Micrograms per kilogram
mg/kg	Milligrams per kilogram
ND<60	Not detected above indicated laboratory reporting limit
NA	Not applicable
NE	Not established
---	Not analyzed
Note 1	Suggested CTDEEP criteria for reference purposes.

CTDEEP GENERAL GUIDANCE ON DEVELOPMENT OF FORMER AGRICULTURAL PROPERTIES

MILONE & MACBROOM

Connecticut Department of Energy & Environmental Protection

General Guidance on Development of Former Agricultural Properties

(March 1999)

The Department of Public Health and the Department of Energy & Environmental Protection have become aware of a number of site development projects on former agricultural land in which persistent pesticides (primarily dieldrin, DDT and breakdown products, chlordane, arsenic) remain in soil at concentrations that approach or exceed the Connecticut Remediation Standard Regulations (RSRs). While such development projects do not specifically fall under the RSRs, concerns have been raised that the residual pesticides constitute a health risk. In light of this, DPH and DEEP offer general guidance for such sites as described below. This guidance is meant to provide an approach that is protective of public health and that also leaves a degree of flexibility. We expect municipal officials and site developers to consider our input together with other factors in deciding how best to handle site re-development projects.

- Evaluate site history and sample surface soil (ideally 0-3 inches depth) in areas where pesticides were applied, handled, and stored. A limited number of deeper samples are also recommended, particularly in areas where there is evidence of substantial surficial contamination. Total mass concentrations and leaching tests should be performed, with consideration given to analyses for newer pesticides if the site is currently agricultural.

- Evaluate detected pesticide concentrations against RSR values. If the concentrations are below the RSR values in all cases, there is no need for further consideration of pesticide contaminant issues at the site. If some concentrations are above the RSRs, the following options for managing the affected soil should be considered:

    1. Keep affected soil separate from other soils and use it on-site as fill under buildings, parking lots, or access roads or dispose of the soil in an approved landfill off-site.
    2. Mix it with unaffected soils to decrease the effective soil concentration. In this case, representative samples should be taken from the mixed soil piles following RCRA protocols regarding the number and location of samples from soil piles. If the mixed concentrations are below the RSRs, the soil pile can then be used anywhere on-site. If the mixed concentrations are still above RSR values, then the soil pile could be used as fill material below grade (but not topsoil) in parts of the site where digging will not occur (i.e., areas where children will not play; non-residential areas; uses as described under Option 1).
    3. Depending upon the degree of RSR exceedance, consideration should be given, in consultation with DPH and DEEP, to removal of specific hot spot areas.
    4. If affected soils are in some manner kept on-site, an additional precautionary step would be post-construction surface soil sampling to ensure that the practices described above have successfully reduced the potential for direct exposure.
    5. If any soils containing pesticides above RSR values remain on-site, the location of these affected soils should be recorded on a site map which is on file at the local health department.

Site-specific data can be provided to DPH (860-509-7742) and DEEP (860-424-3705) to make sure that a particular site does not present unique risks and that the data are suitable for comparing against RSR values.

Remediation Programs and Information

Content Last Updated: November 2006

AERIAL IMAGERY

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2016 AERIAL

HAMILTON AVE SCHOOL ENVIRONMENTAL SOIL INVESTIGATION
GREENWICH PUBLIC SCHOOLS

184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

SCALE	1 " = 75 '
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PROJ. NO.	5062-08-04

FIG. 1

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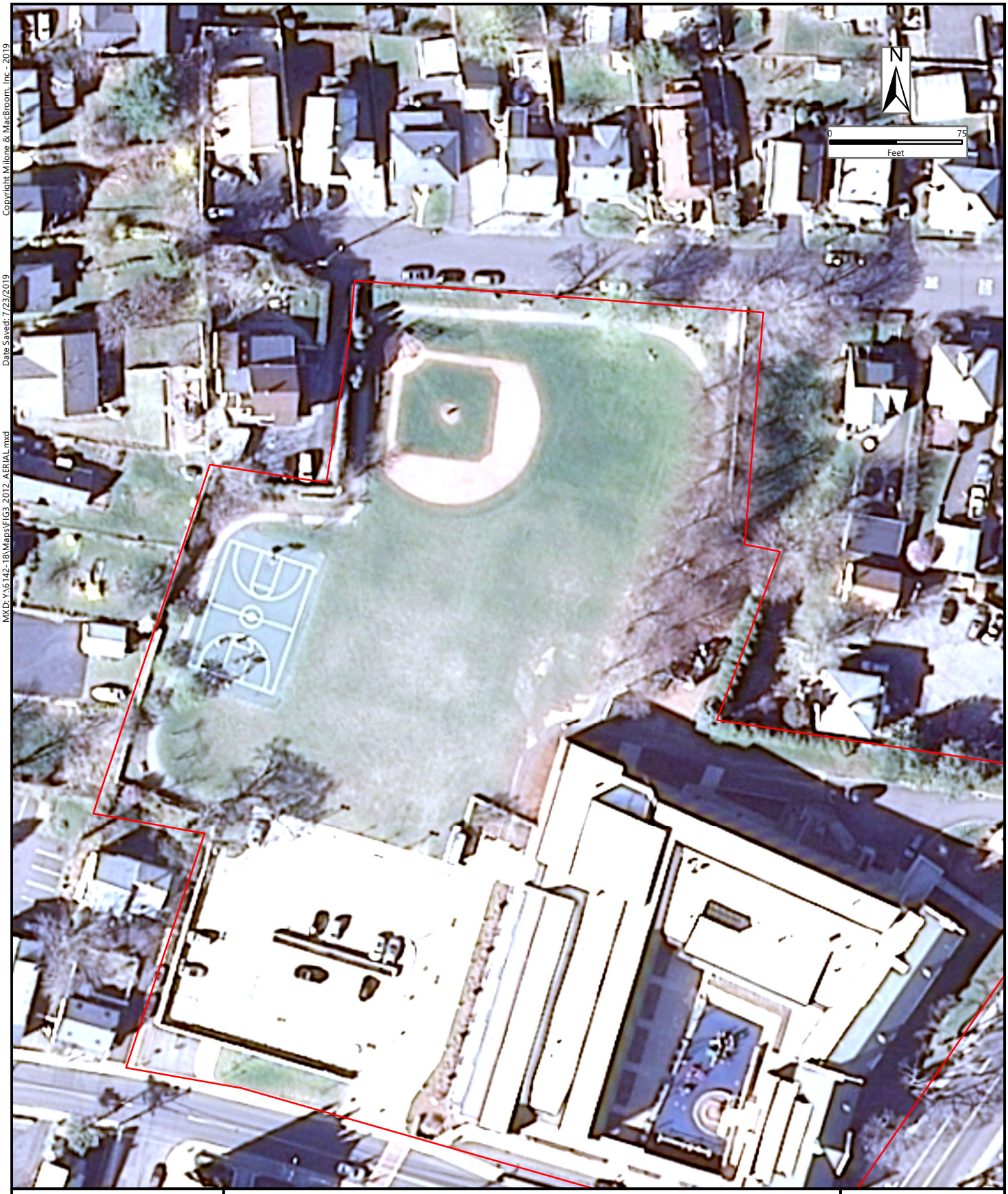

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FIG. 2

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FIG. 3

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FIG. 4

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FIG. 5

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2005 INFRARED (IR) AERIAL

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SCALE	1 " = 75 '
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FIG. 6

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2004 AERIAL

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FIG. 7

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1996 AERIAL

HAMILTON AVE SCHOOL ENVIRONMENTAL SOIL INVESTIGATION
GREENWICH PUBLIC SCHOOLS

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SCALE	1 " = 100 '
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FIG. 8

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1990 AERIAL

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GREENWICH PUBLIC SCHOOLS

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SCALE 1 " = 100 '

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FIG. 9

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1985 AERIAL

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SCALE	1 " = 100 '
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FIG. 10

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1970 AERIAL

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FIG. 11

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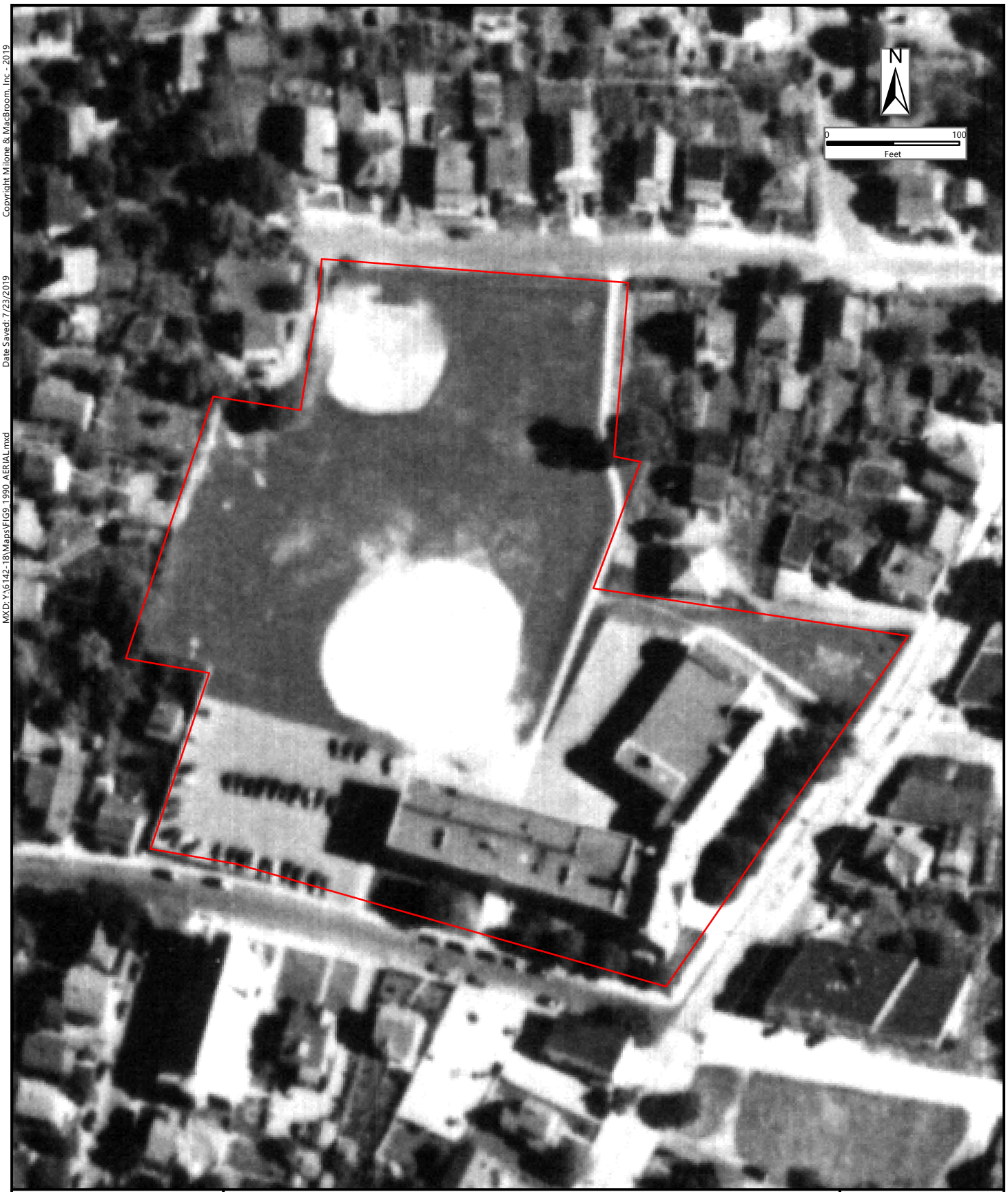

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1951 AERIAL

HAMILTON AVE SCHOOL ENVIRONMENTAL SOIL INVESTIGATION
GREENWICH PUBLIC SCHOOLS

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SCALE	1 " = 100 '
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FIG. 12

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1934 AERIAL

HAMILTON AVE SCHOOL ENVIRONMENTAL SOIL INVESTIGATION
GREENWICH PUBLIC SCHOOLS

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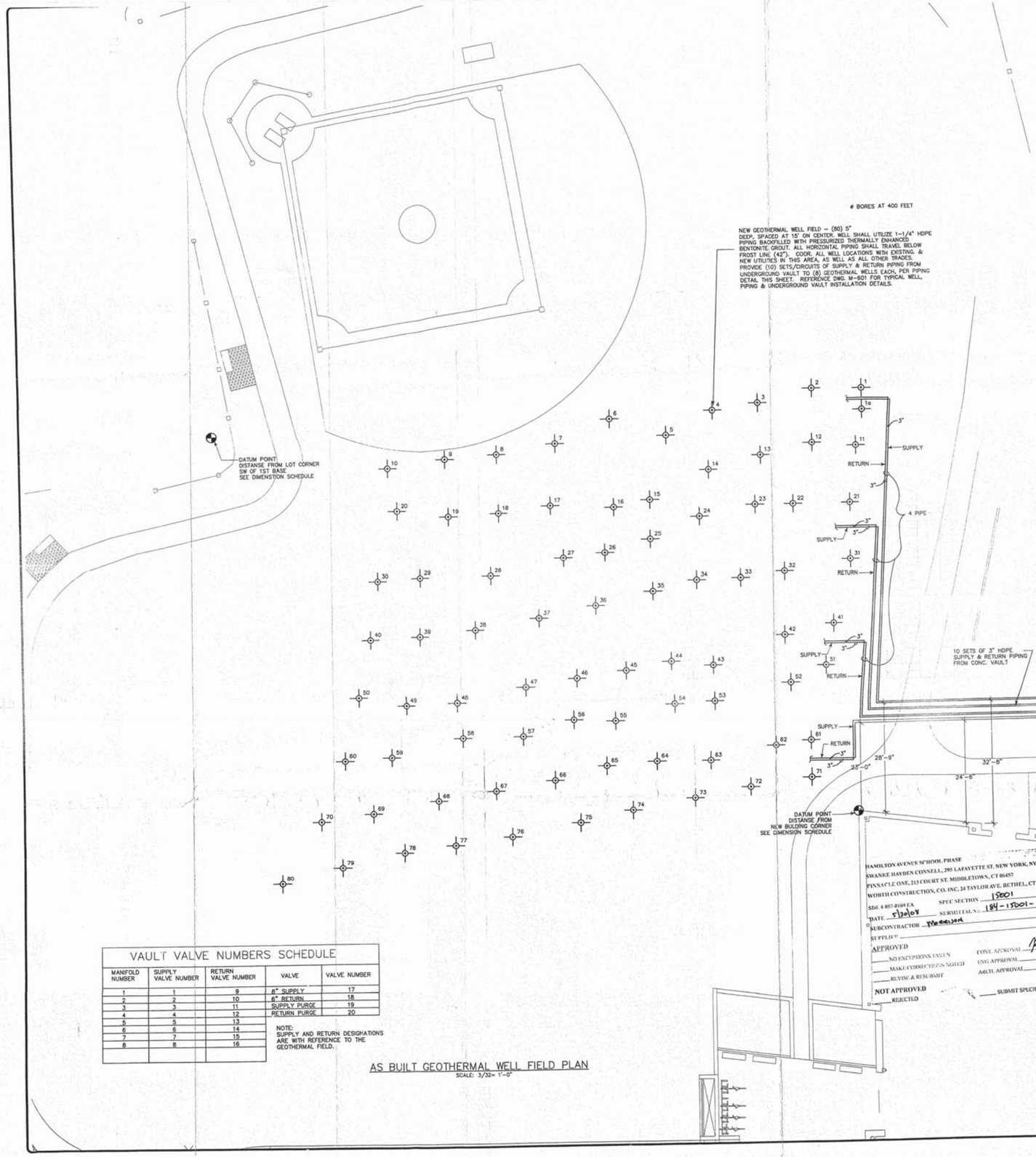
GREENWICH, CONNECTICUT

SCALE	1 " = 200 '
DATE	7/23/2019
PROJ. NO.	5062-08-04

FIG. 13

MUNICIPAL DOCUMENTATION



MANIFOLD NUMBER	WELL NUMBER	DISTANCE FROM NW BLDG CORNER FEET	INCHES	DISTANCE FROM LOT CORNER SOUTHWEST OF 1ST BASE FEET	INCHES
1	1	111	6	172	0
	2	112	1	158	6
	3	110	10	144	0
	4	112	6	132	0
	5	111	6	119	6
	6	122	6	105	0
	7	125	9	90	6
	8	133	10	75	6
	9	143	10	62	0
	10	153	8	47	0
2	11	96	6	170	0
	12	98	0	158	0
	13	97	6	144	6
	14	98	6	131	0
	15	99	0	116	6
	16	103	0	107	6
	17	114	6	91	0
	18	123	0	78	6
	19	133	0	66	0
	20	145	3	52	6
3	21	81	6	169	3
	22	83	0	154	0
	23	85	6	144	0
	24	88	6	130	0
	25	90	6	118	6
	26	95	6	108	0
	27	102	6	98	0
	28	114	10	82	4
	29	130	9	66	6
	30	140	7	58	0
4	31	66	6	171	6
	32	66	2	154	10
	33	69	0	144	0
	34	74	6	133	0
	35	79	6	123	0
	36	88	0	110	6
	37	98	5	98	7
	38	111	7	86	3
	39	124	3	76	3
	40	136	6	68	0
5	41	50	0	171	0
	42	50	6	159	6
	43	54	6	145	0
	44	63	6	134	6
	45	71	8	125	3
	46	82	2	115	4
	47	93	6	106	0
	48	109	6	96	6
	49	122	6	87	6
	50	135	4	79	0
6	51	39	6	172	6
	52	38	6	165	6
	53	48	0	149	6
	54	56	6	140	6
	55	68	6	130	0
	56	79	0	121	0
	57	90	6	114	0
	58	106	0	103	6
	59	124	0	97	0
	60	136	3	92	6
7	61	22	10	176	8
	62	28	3	168	0
	63	41	6	156	6
	64	55	0	145	0
	65	67	6	135	6
	66	80	6	128	0
	67	95	6	120	0
	68	110	6	113	6
	69	128	0	108	6
	70	141	7	106	0
8	71	15	7	181	0
	72	29	6	157	0
	73	43	6	146	6
	74	59	6	139	6
	75	73	4	140	9
	76	91	2	132	3
	77	106	5	125	9
	78	120	2	121	3
	79	136	11	119	3
	80	153	1	120	0
1a				172	0

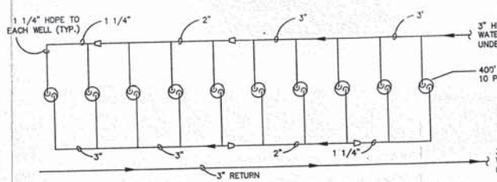
VAULT VALVE NUMBERS SCHEDULE

MANIFOLD NUMBER	SUPPLY VALVE NUMBER	RETURN VALVE NUMBER	VALVE	VALVE NUMBER
1	1	9	6" SUPPLY	17
2	2	10	6" RETURN	18
3	3	11	SUPPLY PURGE	19
4	4	12	RETURN PURGE	20
5	5	13		
6	6	14		
7	7	15		
8	8	16		

NOTE:
SUPPLY AND RETURN DESIGNATIONS ARE WITH REFERENCE TO THE GEOTHERMAL FIELD.

AS BUILT GEOTHERMAL WELL FIELD PLAN
SCALE: 3/32= 1'-0"

HAMILTON AVENUE SCHOOL PHASE
SWANKE HAYDEN CONNELL, 295 LAFAYETTE ST. NEW YORK, NY 10012
PINNACLE ONE, 213 COURT ST. MIDDLETOWN, CT 06457
WORTH CONSTRUCTION, CO. INC. 24 TAYLOR AVE. BETHEL, CT 06801
SDE. # 057-0109 EA — SPEC SECTION 15001
DATE 5/20/08 — SUBMITTAL N.: 184-15001-01
SUBCONTRACTOR Weckesser
SUPPLIER
APPROVED — CONT. APPROVAL
NO EXCEPTIONS TAKEN — ENG. APPROVAL
MAKE CORRECTIONS NOTED — ARCH. APPROVAL
REVISE & RESUBMIT
NOT APPROVED — SUBMIT SPECIFIED ITEM
REJECTED



TYPICAL GEOTHERMAL WELL CIRCUIT PIPING
NTS

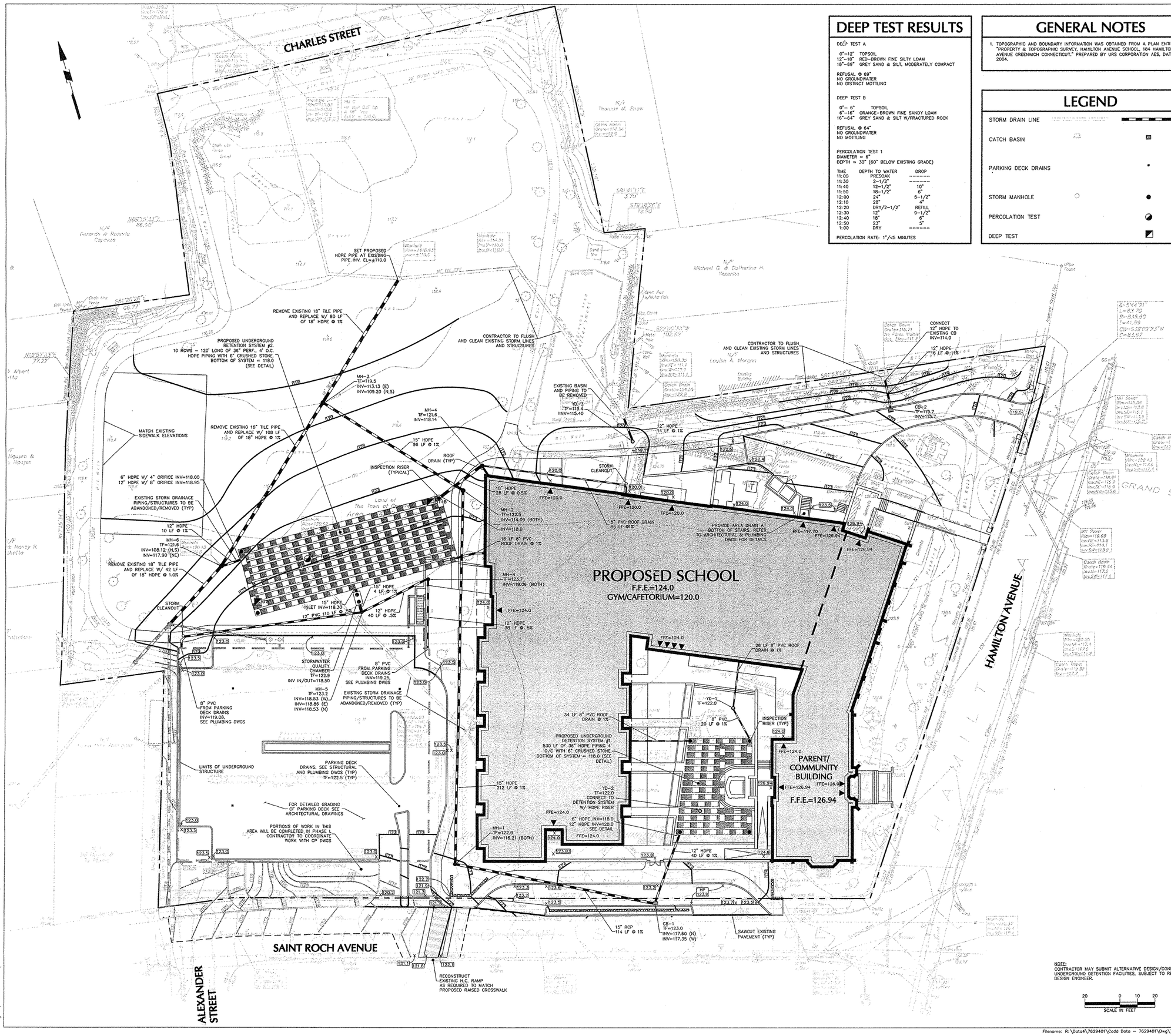
Morrison Incorporated
63 Gambers Corner Rd
Dunnconnon, PA 17020
* Tel: 717-834-5667

PHASE TWO
HAMILTON AVENUE SCHOOL
GREENWICH, CONNECTICUT
SDE # 057-0109 EA

GEOTHERMAL WELL FIELD PLAN

Drawn	K.G.R
Check	
Date	2/4/08
Job No.	

Sheet:
M-001



NOTE:
CONTRACTOR MAY SUBMIT ALTERNATIVE DESIGN/CONFIGURATION FOR UNDERGROUND DETENTION FACILITIES, SUBJECT TO REVIEW OF DESIGN ENGINEER.

20 0 10 20
SCALE IN FEET

DEEP TEST RESULTS

DEEP TEST A

0"–12" TOPSOIL
12"–18" RED–BROWN FINE SILTY LOAM
18"–69" GREY SAND & SILT, MODERATELY COMPACT

REFUSAL @ 69"
NO GROUNDWATER
NO DISTINCT MOTTLING

DEEP TEST B

0"– 6" TOPSOIL
6"–16" ORANGE–BROWN FINE SANDY LOAM
16"–64" GREY SAND & SILT W/FRACTURED ROCK

REFUSAL @ 64"
NO GROUNDWATER
NO MOTTLING

PERCOLATION TEST 1
DIAMETER = 6"
DEPTH = 30" (60" BELOW EXISTING GRADE)

TIME	DEPTH TO WATER	DROP
11:00	PRESOAK	
11:30	2–1/2"	
11:40	12–1/2"	10"
11:50	18–1/2"	6"
12:00	24"	5–1/2"
12:10	28"	4"
12:20	DRY/2–1/2"	REFILL
12:30	12"	9–1/2"
12:40	18"	6"
12:50	23"	5"
1:00	DRY	

PERCOLATION RATE: 1"/<5 MINUTES

GENERAL NOTES

1. TOPOGRAPHIC AND BOUNDARY INFORMATION WAS OBTAINED FROM A PLAN ENTITLED "PROPERTY & TOPOGRAPHIC SURVEY, HAMILTON AVENUE SCHOOL, 184 HAMILTON AVENUE GREENWICH CONNECTICUT," PREPARED BY URS CORPORATION AES, DATED JULY 2004.

LEGEND

STORM DRAIN LINE
CATCH BASIN
PARKING DECK DRAINS
STORM MANHOLE
PERCOLATION TEST
DEEP TEST

SWANKE HAYDEN CONNELL ARCHITECTS

Swanke Hayden Connell Ltd
Swanke Hayden Connell & Partners, LLP
295 Lafayette Street, New York, New York 10012
Phone 212 226 9696, Fax 212 219 0059

Client
Hamilton Avenue School Building Committee
c/o Greenwich Board of Education
290 Greenwich Avenue Havemeyer Building
Greenwich, CT 06830

Project Manager/ Owner's Representative
Pinnacle One
213 Court Street, Suite 700
Middletown, CT 06457

Civil Engineer / Landscape
LANGAN ENGINEERING & ENVIRONMENTAL SERVICES
Long Wharf Maritime Center
555 Long Wharf Drive
New Haven, CT 06511-6107

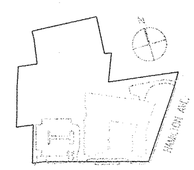
Structural Engineer
The DiSalvo Ericson Group
63 Copps Hill Road
Ridgefield, CT 06877

MEP Engineer
Thornton Tomasetti Group
LZA Associates Division
7 Cambridge Drive Suite 215
Trumbull, CT 06611

Consulting Environmental Designers
Atelier Ten
45 East 20th Street 4th Floor
New York, NY 10003

No.	Date	Revision
	8/29/2005	Construction Documents Issued for OSF Review

Key Plan



Job Title

Phase Two
Hamilton Avenue School
Greenwich, Connecticut
SDE # 057-0109 EA

Drawing Title
GRADING & DRAINAGE PLAN

Issue Date: 29 AUGUST 2005
Scale: 1"=20'
Seal
Drawn By: WKB
Checked By: RPP
Project No.: 7629401
Drawing No.: C101

ROBERT P. PRYOR, CT PE#19078

Aug 31, 2005 - 3:04pm

Filename: R:\Data4\7629401\Cadd Data – 7629401\Dwg\7629401C101.dwg Date: 8/31/2005 Time: 15:04 User: asuarato Style Table: Langan.stb Layout: FULL_SIZE

APPENDIX B
SOIL EVALUATION TEST RESULTS

Town of Greenwich
Department of Public Works - Engineering Division
Town Hall - 101 Field Point Road, Greenwich, CT 06830
Phone 203-622-7767 - Fax 203-622-7747

SOIL EVALUATION TEST RESULTS

Project Name: **Hamilton Avenue Field Reconstruction**

Project Address: **184 Hamilton Avenue**

Engineering Firm's Name: **Milone and MacBroom, Inc.**

Engineer's Name: **Chris Hulk, PE**

Test Pit or Soil Boring #: TP-1 **Ground Elevation: 116.8**

Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches
116.8-116.05	Topsoil	9
116.05-114.7	Medium brown fine sandy loam	25
114.7-114.3	Breakable Ledge	30

Elevation		Depth in Inches
	Mottling (Seasonally High Groundwater)	
	Groundwater	
114.7	Ledge	25

Saturated Hydraulic Conductivity Test Location #: None Performed

Ground Elevation: _____

Top Elevation of Proposed Infiltration System: _____

Bottom Elevation of Proposed Infiltration System: _____

Elevation of Test*: _____

Test Method (check one of the following acceptable methods**):

_____ Borehole infiltration test (NHDES, 2008)
_____ Guelph permeameter - ASTM D5126-90 Method
_____ Falling head permeameter – ASTM D5126-90 Method
_____ Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
_____ Amoozemeter or Amoozegar (constant head) permeameter – Amoozegar 1992

Attach field data forms for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate: _____

**A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.

* All test pits or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system.

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Chris Hulk, PE		7/8/2016
Name of Test Conductor	Signature of Test Conductor	Date

Town of Greenwich
Department of Public Works - Engineering Division
Town Hall - 101 Field Point Road, Greenwich, CT 06830
Phone 203-622-7767 - Fax 203-622-7747

SOIL EVALUATION TEST RESULTS

Project Name: **Hamilton Avenue Field Reconstruction**

Project Address: **184 Hamilton Avenue**

Engineering Firm's Name: **Milone and MacBroom, Inc.**

Engineer's Name: **Chris Hulk, PE**

Test Pit or Soil Boring #: TP-2 **Ground Elevation: 118**

Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches
118-117-6	Topsoil	5
117.6-117.0	Medium gray processes aggregate fill	13
117.0-116.0	Compact medium brown silty sandy loam	24

Elevation		Depth in Inches
	Mottling (Seasonally High Groundwater)	
	Groundwater	
116	Ledge	24

* All test pits or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system.

Saturated Hydraulic Conductivity Test Location #: None Performed

Ground Elevation: _____

Top Elevation of Proposed Infiltration System: _____

Bottom Elevation of Proposed Infiltration System: _____

Elevation of Test*: _____

Test Method (check one of the following acceptable methods**):

_____ Borehole infiltration test (NHDES, 2008)
_____ Guelph permeameter - ASTM D5126-90 Method
_____ Falling head permeameter – ASTM D5126-90 Method
_____ Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
_____ Amoozemeter or Amoozegar (constant head) permeameter – Amoozegar 1992

Attach field data forms for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate: _____

**A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

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Chris Hulk, PE		7/8/2016
Name of Test Conductor	Signature of Test Conductor	Date

Town of Greenwich
Department of Public Works - Engineering Division
Town Hall - 101 Field Point Road, Greenwich, CT 06830
Phone 203-622-7767 - Fax 203-622-7747

SOIL EVALUATION TEST RESULTS

Project Name: **Hamilton Avenue Field Reconstruction**

Project Address: **184 Hamilton Avenue**

Engineering Firm's Name: **Milone and MacBroom, Inc.**

Engineer's Name: **Chris Hulk, PE**

Test Pit or Soil Boring #: TP-3 **Ground Elevation: 119**

Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches
119-118.7	Topsoil	4
118.7-116.3	Medium brown fine sandy loam	32

Elevation		Depth in Inches
	Mottling (Seasonally High Groundwater)	
	Groundwater	
	Ledge	

Saturated Hydraulic Conductivity Test Location #: None Performed

Ground Elevation: _____

Top Elevation of Proposed Infiltration System: _____

Bottom Elevation of Proposed Infiltration System: _____

Elevation of Test*: _____

Test Method (check one of the following acceptable methods**):

_____ Borehole infiltration test (NHDES, 2008)
_____ Guelph permeameter - ASTM D5126-90 Method
_____ Falling head permeameter – ASTM D5126-90 Method
_____ Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
_____ Amoozemeter or Amoozegar (constant head) permeameter – Amoozegar 1992

Attach field data forms for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate: _____

**A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.

* All test pits or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system.

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS REPORT IS TRUE AND CORRECT.

Chris Hulk, PE		7/8/2016
Name of Test Conductor	Signature of Test Conductor	Date

APPENDIX C
GEOTECHNICAL INVESTIGATION

GEOTECHNICAL ENGINEERING REPORT
Hamilton Avenue School
Greenwich, Connecticut

Prepared For:

Swanke Hayden Connell Architects
295 Lafayette Street
New York, New York 10012

Prepared By:

Langan Engineering and Environmental Services
360 West 31st Street, Suite 900
New York, NY 10001-2727

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

3 March 2005
5641901

GEOTECHNICAL ENGINEERIG REPORT
Hamilton Avenue School
Greenwich, Connecticut

Prepared For:

Swanke Hayden Connell Architects
295 Lafayette Street
New York, New York 10012

Prepared By:

Langan Engineering and Environmental Services
360 West 31st Street, Suite 900
New York, NY 10001-2727

Jill T. Fasano
Sr. Staff Engineer

Alan R. Poeppel
Senior Associate

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

3 March 2005
5641901

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- **Bedrock** 5
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5. FOUNDATION DRAINAGE DETAIL
6. PERMANENT LATERAL EARTH PRESSURES

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INTRODUCTION

This report provides our geotechnical engineering study for the proposed renovation and reconstruction of Hamilton Avenue School, Greenwich, Connecticut. The purpose of the study was to investigate the subsurface conditions and develop recommendations for foundation design and construction. Our geotechnical engineering study included a field investigation, an evaluation of the subsurface conditions, and a determination of the most suitable foundation system. Design parameters for foundation bearing capacity, seismic design, groundwater control, pavements, below grade walls and recommendations for earthwork are provided. The work was performed in accordance with the Langan Engineering and Environmental Services, P.C. (Langan) proposal to Swanke Hayden Connell Architects (SHCA).

Architectural information was provided by SHCA, and structural information was provided by The Di Salvo Ericson Group (DSEG). Ground surface elevations were obtained from the "Site Survey" prepared by URS Corporation (URS), dated July 2004. Surface elevations at the boring locations were inferred from the survey. All elevations given in this report are with respect to the North American Vertical Datum (NAVD 29).

SITE DESCRIPTION

The reference site is a 4.4-acre parcel bounded by Hamilton Avenue to the east, Saint Roch's Avenue to the south, and residential properties to the north and west, Greenwich, Connecticut. The site is occupied by the existing Hamilton Avenue School, a parking area, playground areas, a basketball court and a baseball field. The existing school building is L-shaped and is a 2-story structure. The corner of the building lies at the intersection of Saint Roch's Avenue and Hamilton Avenue. There is one cellar level under portions of the existing building footprint. The lowest level is about el 113 and the first floor level is about el 126.5.

There is as much as 9 ft of relief over the site, with surface grades ranging from el 117 to el 126 based on the site topographic survey. Outcrops of bedrock were visible at the northwest corner of the property. Locally the site is on a topographic high, with surface grades dropping about 15 ft over 300 ft horizontal distance.

PROPOSED CONSTRUCTION

The proposed construction consists of demolishing and reconstructing the Hamilton Avenue School, construction of a new parking garage, and other site improvements.

Demolition

The demolition of the existing school will include the south wing facing Saint Roch's Avenue and a portion of the north wing to the west. The eastern portion of the existing building facing Hamilton Avenue will remain with the exception of the floor slab located in the northern most section of the building.

New School Building

The new school building will be a two-story U-shaped structure having a footprint of about 41,000 ft^2. The proposed first floor level is el 123 in the southwest wing and el 122.5 elsewhere. The Auditorium and gymnasium is depressed at el 116.5. A cellar level is proposed under a portion of the building, and will have a finished floor of el 112.5. The cellar level will be utilized for mechanical equipment, boiler room and storage.

The building construction will consist of a steel frame with concrete and metal deck floors. Typical column spacing will range from 15 to 30 ft. Total column loads-gravity load-superimposed dead loads and live loads - will range from 100 to 400 kips. The ground floors will have a design live load of 100 psf.

Parking Garage

A 94-spot parking garage is planned west of the school building. The garage will have one below grade level and one above grade level. The lower level will be roughly level with the building cellar at el 112.33. The project also includes outdoor activity areas to the west and north of the school building. The construction will be cast in place concrete and pre-cast concrete.

SUBSURFACE INVESTIGATION

A subsurface investigation consisted of 14 borings, identified as B1 thru B3, B5 thru B9, and B11 thru B16, are shown in plan on Figure 2. The drilling was performed by Soil Testing Inc. under the full-time controlled inspection of a Langan engineer. The fieldwork was performed between 27 and 30 December 2004.

Borings

The borings were advanced from truck mounted drill rigs utilizing a hollow stem auger. The boring depth ranged from 4 to 20 ft below grade. Bedrock was cored in ten of the borings. Soil samples were typically taken continuously until refusal or top of bedrock. Samples were obtained using a standard two-inch outside diameter split spoon sampler with a 140 lb hammer in accordance with ASTM-1586-99 (Standard Penetration Test, SPT). A safety drive hammer was used for all borings.

Rock cores were obtained with an NX-sized double tube core barrel with a diamond cutting bit. Rock type, percent core recoveries, and Rock Quality Designation (RQD) values were determined for each core run. The core recovery is the ratio of the length of rock recovered over the total rock core length, expressed as a percent. The RQD is defined as the ratio of the summation of each rock piece greater than 4 inches over the total core length, expressed as a percent.

Recovered soil samples and rock cores were visually examined and classified in the field. The soil materials were classified in accordance with the Unified Soil Classification System (USCS). Soil and rock classifications, standard penetration resistances, rock recoveries and RQD's, and other pertinent field observations were recorded on field logs. The boring logs are provided in Appendix A.

Observation Well

The groundwater level was determined by monitoring three observation wells installed in completed boreholes B5, B11, and B16. Each well consisted of a 1¼-inch inside diameter solid PVC pipe with a 10 ft long slotted screen at the bottom of each well. Water level readings were measured from the observation wells periodically over a two month period. Well

construction logs are presented in Appendix A.

Laboratory Testing

Selected samples were sent to the laboratory for testing of index properties. The laboratory testing program consisted of:

- 9 natural water content determinations, and
- 9 sieve analyses.

The purpose of the laboratory testing was to define the suitability of the on-site soils for use as backfill material. The laboratory test results are included in Appendix B.

SUBSURFACE CONDITIONS

The subsurface soil profile consists generally of a layer of sand underlain by a layer of dense sand and gravel or decomposed rock and finally bedrock. A stratum of fine grained soil was encountered in four of the borings. A surface asphalt pavement or topsoil was encountered in the majority of the borings. A playground surface was encountered in borings B-2 and B-5. A description of each layer is given below and subsurface profiles are provided as Figure 3.

Fill or Topsoil

Fill or Topsoil was encountered in the top 1.5 to 2 ft in six of the borings, either located in the grass covered space or the playground area. The material consisted of grey-brown silty medium to fine sand with varying amounts of gravel. The Standard Penetration Resistances (N-values) in this material ranged from 5 to 10 blows per foot (blows/ft). The material is classified as SM in accordance with the Unified Soil Classification System (USCS).

Silt

Grey silt with varying amounts of sand, gravel and clay was encountered in four of the borings. The material thickness ranged from 1 to 4 ft. The N-values ranged from 5 to 18 blows/ft, and averaged 8 blows/ft. The silt is classified as ML in accordance with the USCS.

Sand

Brown and grey medium to fine sand with varying amounts of silt and gravel was encountered in all borings. The top of the sand was encountered at 6 inches to 4 ft below ground surface

and the corresponding top of sand elevation ranged from el 118 to el 125. The material thickness ranged from 1 to 12 ft, and averaged about 4 ft. In two borings a layer of coarse to fine gravel was encountered within the sand stratum. The gravel thickness ranged from 6 inches in B-9 to 3.5 ft in B-7. The N-values in the sand and gravel ranged from 7 blows/ft to 100 blows per 2 inches of penetration. An average N-value value ignoring the values greater than 100 blows/ft, was 23 blows/ft. The sand is classified as SM, SP or GP in accordance with the USCS.

Decomposed Rock

Decomposed/weathered rock was encountered directly above the bedrock in six of the borings. The thickness ranged from about 6 inches to 1 ft. The recorded N-values in this layer were all greater than 50 blows for 2 inches of spoon penetration.

Bedrock

The rock is described as Harrison Gneiss, an interlayered light and dark grey, medium-grained, foliated gneiss. The depth to bedrock ranged from 3 to 13.5 ft with an average depth of 6.5 ft. The corresponding top of rock elevation ranged from el 111.2 to el 122.5 with an average of el 115.6. The top of bedrock elevations are presented in Figure 4. The rock core recoveries ranged from 62 to 100 percent, and averaged 86 percent. The RQD values ranged from 30 to 100 percent, and averaged 63 percent.

Groundwater

Groundwater levels were measured on 20 January and 1 March 2005. The reported water level ranged from about 6.4 to 16.1 ft below the existing ground surface or about 4 to 5 ft below top of rock. The corresponding groundwater elevation ranged from about el 116.6 at B-5 and B-11 to el 105.3 at B-16.

RECOMMENDATIONS

Our recommendations for foundation system, seismic parameters, permanent groundwater control, ground floor slab support, below grade walls, backfill and compaction, and rock excavation are presented herein.

Foundation System

The proposed reconstructed Hamilton Avenue School building can be supported on shallow spread footings bearing on the natural sand and gravel or the bedrock. The recommended minimum individual footing area is 9 ft^2. For continuous perimeter wall footings, the recommended minimum footing width is 2 ft. Specific recommendations for the varying foundation subgrade material are as follows:

Sand

Medium dense sand was encountered at the foundation level of the unexcavated southwest wing. The average N-value of this bearing material is 23 blows/ft. The recommended allowable bearing capacity is 3 tons/ft^2.

Bedrock

Bedrock was encountered at or within 2 ft of the proposed foundation level for the balance of the school building and the garage structure. This includes the cellar, depressed auditorium and gymnasium, and the unexcavated area fronting Hamilton Avenue. The recommended allowable bearing capacity is 20 ton/ft^2.

Subgrade Preparation

All subgrades should be level and free of loose soil, rock fragments, and deleterious materials. New foundations should be placed such that a theoretical influence line drawn between the bases of the new and of any adjacent foundations is 45 degrees or less with the horizontal plane. This is to avoid inducing additional load on adjacent lower level foundations and to avoid disturbing bearing stratum of adjacent higher level foundations. The estimated bottom of footing elevations should be shown on the foundation plan or details.

For footings bearing on rock, subgrades should be on a level surface and are expected to have adequate lateral support from the surrounding rock. Sloping top of rock, joints, foliation, and local zones of weathered or fractured rock may require locally deepening the footing excavations. Footing bearing surfaces should be level and clear of debris, standing or frozen water, and other deleterious materials. Compressed air should be used to clean all rock bearing surfaces.

Settlement

Total settlements are not expected to exceed ¾ inch and the differential settlement between adjacent columns is not expected to exceed ½ inch. The majority of the settlement due to dead load and sustained live loads will occur during construction as the loads are applied.

Seismic Parameters

The following section provides the design ground motions for the project site, based on the requirements for Earthquake Loads in Section 1615 of the *Building Code of the State of New York* (Building Code) dated May 2002.

International Bldg Code
2003

Maximum Earthquake Response Acceleration

The "mapped" maximum considered earthquake spectral response acceleration, at short periods (S_S) and at 1 second period (S_1) is determined from Figure 1615(1), and 1615(2). For Greenwich, Connecticut, the value of S_S is about 0.35 times the acceleration due to gravity (0.35 g), and the value of S_1 is about 0.095 g.

Site Classification

The Building Code assigns a seismic site classification (Site Class) based on the type and thickness of overburden soil materials. Site Class values are given in the Building Code in Table 1615.1.1, and range from Class A for hard bedrock to Class E and Class F for deep deposits of unsuitable or soft bearing strata. The site is underlain by rock. Based on empirical correlations, the shear wave velocity of the rock encountered at the site ranges from 2,500 to 5,000 ft/s. Therefore, we have judged the subsurface profile below the proposed foundation level to have the characteristics of Class B for rock in accordance with the New York State Building Code classification system.

Site Coefficients

The seismic site coefficients for short period (F_a) and 1 second period (F_v) are determined based on the site class and the maximum earthquake response acceleration of the site – Tables 1615.1.2(1) and 1615.1.2(2). For Site Class B, the site coefficient F_a is 1.0 and the site coefficient F_v is 1.0.

Design Spectral Response Acceleration

The site coefficients are multiplied by the mapped maximum earthquake response accelerations to adjust for site effects, using equations 16-~~16~~ 38 and 16-~~17~~ 39. For the proposed site, the short period adjusted acceleration, S_{MS}, is 0.35g, and the 1 second period adjusted acceleration, S_{M1}, is 0.10g.

The design spectral response acceleration at 5% damping is calculated from adjusted accelerations using equations 16-~~18~~ 40 and 16-~~19~~ 41. For the project site, the design spectral acceleration at short periods, S_{DS} is equal to 0.23 g, and at 1 second period, S_{D1} is equal to 0.06g.

Liquefaction Potential

The effects of soil liquefaction need not be considered in the foundation design. No loose granular soils were encountered below the groundwater level. Therefore, the geologic profile at the subject site is not prone to soil liquefaction.

Groundwater Impacts

Design Groundwater Level

We recommend the design groundwater level be taken as 2 ft above the stabilized water levels in the observation wells. Because the groundwater level varied greatly from wells B-5 and B-11 to B-16, we have developed two recommended design groundwater levels:

Well B-5 and B-11 representing the building cellar and depressed auditorium and gymnasium, el 118.5, and

Well B-16 representing the parking garage, el 107.0.

The design groundwater levels should be used for design of below grade building structures as well as for utility pipes, catch basins and manholes, and detention structures. The cellar floor slab at el 112.5 could be designed as a pressure slab capable of resisting hydrostatic uplift pressures resulting from 6 ft of water head.

Alternatively, hydrostatic uplift pressures can be relieved by keying the perimeter cellar walls into the rock and providing a sub-slab drainage system. The perimeter below-grade walls should be extended a minimum of 1 ft into bedrock to act as a cut-off and reduce water inflow. The concrete footing should be cast unformed directly against the rock. The permanent under-slab drainage system for the cellar level, lower garage and auditorium should consist of a layer of porous stone and an interconnected network of perforated drainage pipes connected to sump pits. We recommend a minimum 12-inch-thick layer porous fill be used. Excavated bedrock could be crushed on-site and re-used for porous fill. The pipes should be at least 4-inch-diameter and the spacing should not exceed 40 ft on-center.

We recommend a design flow of 1 gallon per square foot of ground floor area per day as an initial estimate. The actual groundwater flow, and drainage pipe spacing and sump pit locations should be re-assessed during construction while the excavation is open.

Waterproofing

We recommend that the below grade walls be protected with a waterproofing material to prevent water from entering the space. If the pressure slab alternative is utilized, the underside of the slab should be waterproofed as well. We recommend a membrane type of waterproofing be used, such as the Prepruf and Bituthene products by Grace. The use of bentonite waterproofing or negative side crystalline waterproofing is not recommended. The vertical waterproofing should be protected with a rigid barrier to prevent damage to the waterproofing during backfilling operations. A schematic section of the drainage system for the below grade walls is presented in Figure 5.

Ground Floor Slabs

The ground floor slab can be designed as a slab-on-grade provided that the groundwater control measures are implemented. All topsoil and associated root mat should be removed as part of

surface surcharge loads need not be considered for the dynamic loading condition. Our recommended dynamic earth pressure diagram is presented in Figure 6b.

Flexible Pavements

Where the entire pavement section is to be replaced, we recommend the underlying subgrade be proofrolled. This consists of compacting the subgrade with a smooth drum vibratory roller. We recommend at least six overlapping passes with a roller having a static weight of at least 10 tons. Any soft zones that remain after proofrolling should be removed and replaced with controlled fill. The recommended CBR value for proofrolled subgrade is 10 for silt and 15 for sand.

Backfill and Compaction

The lower sand material containing no more than 30 percent by dry weight passing the No. 200 sieve (fines) is suitable for use inside the building where grades are raised 2 ft or less. The same material can be used behind foundation walls and beneath site pavements. When filling more than 2 ft within the building, imported controlled fill containing no more than 15 percent fines should be used. The near surface silty sand and silt should be re-used only in landscaped areas. All fill should be free of organic, frozen, and other deleterious materials, and should have a maximum particle size no greater than 4 inches.

Fill material should be placed in uniform 12-inch-thick loose lifts and compacted to at least 95 percent of its maximum dry unit weight as determined by ASTM test designation D1557-93. In restricted areas where only hand-operated compactors can be used, the maximum lift thickness should be limited to 8 inches. The appropriate water content at the time of compaction should be plus or minus 2 percentage points of optimum as determined by the laboratory compaction tests of proposed fill material. No fill materials should be placed on areas where free water is standing or on frozen subsoil areas.

Backfill should not be placed against below grade walls until the wall concrete has reached its 28-day strength. In addition, backfilling should be performed after either the first floor slab has been completed or temporary lateral bracing has been provided to prevent rotation of the wall. The design of a self supported retaining wall as a foundation wall may be more cost effective to

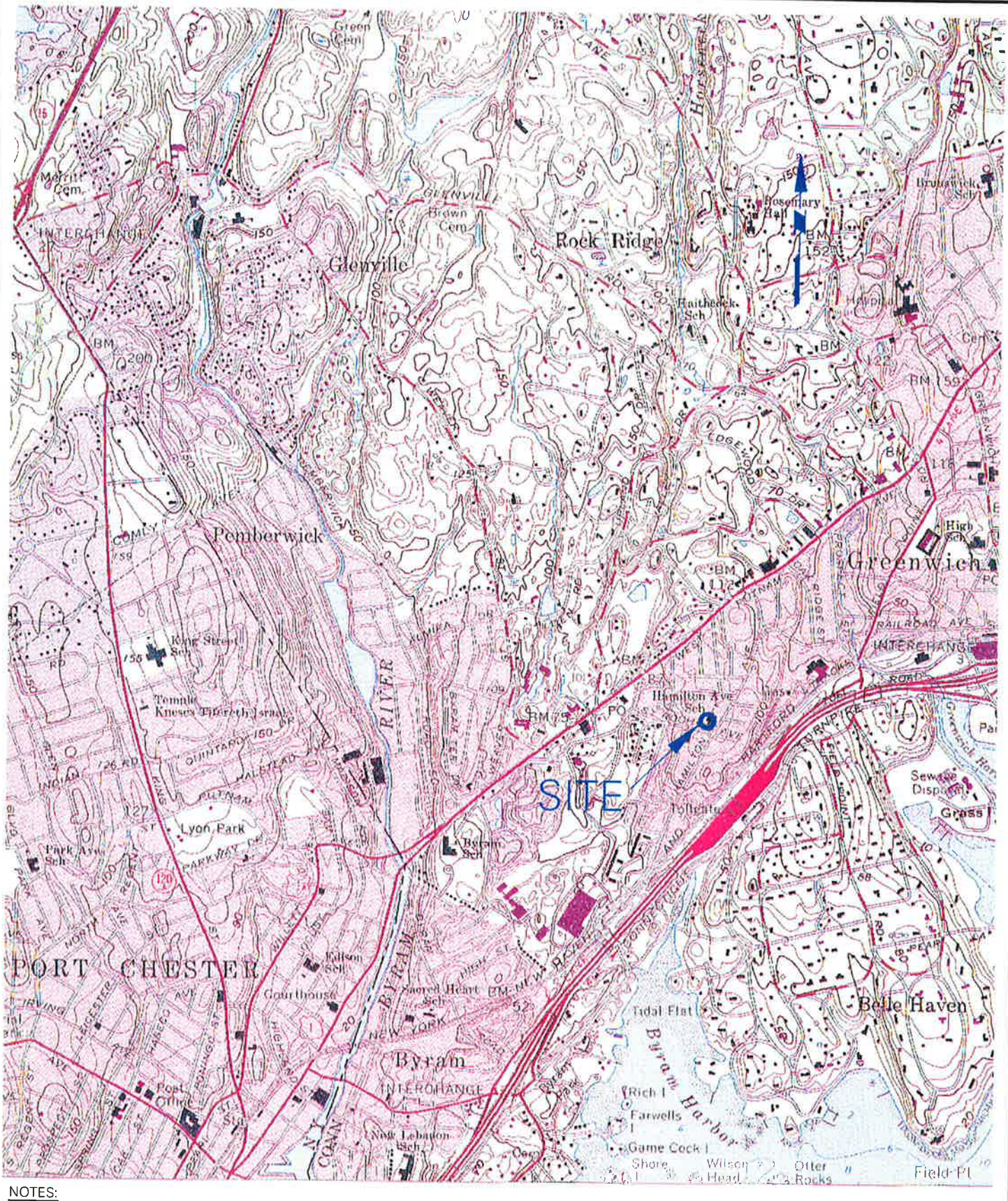
resist the unbalanced lateral earth pressures on the building and to facilitate backfill of these walls.

Rock Excavation

We expect as much as 10 ft of bedrock excavation will be needed for construction of the parking garage, cellar levels and the auditorium/gymnasium. We expect the bedrock material can be readily broken with backhoe-mounted hoerams. Depending on the column layout, line drilling of the rock may be needed to prevent overbreak below footings. Some rock bolting may be needed to stabilize the rock mass below raised footings or for safety purposes during construction. Exposed rock faces should be examined geologically and mapped as the excavation proceeds. Rock bolts or wire mesh should be used to secure any potentially loose or unstable rock masses. The rock bolts should extend at least 5 ft beyond potential failure planes of rock wedges. The need for rock bolts, including spacing and length, must be determined by a qualified engineer in the field.

LIMITATIONS

The conclusions and recommendations given in this report are based on subsurface conditions inferred from a limited number of borings and from structural information provided to us. Recommendations given are contingent upon one another and no recommendation should be followed independent of the others. This report has been prepared to assist Swanke Hayden Connell Architects and The Di Salvo Ericson Group in the design. It is intended for use with regard to the given information and any changes in structures or locations should be brought to our attention so that we may determine how such changes may affect our recommendations.



NOTES:

1. REFERENCE GLENVILLE, CONNECTICUT USGS QUADRANGLE MAP, PHOTOREVISED 1971.

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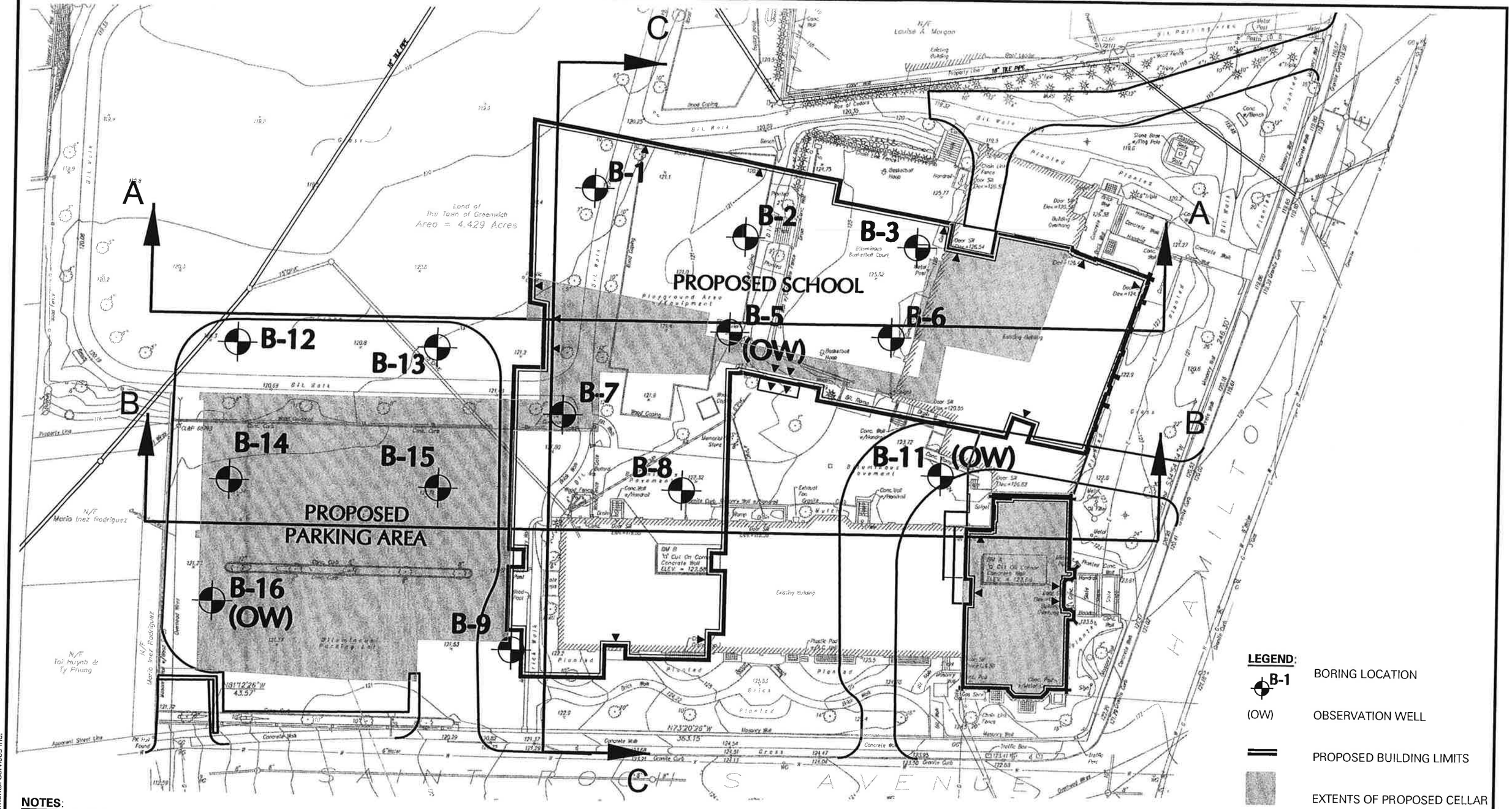
HAMILTON AVENUE SCHOOL

SITE LOCATION PLAN

GREENWICH CONNECTICUT

PROJ. NO:	SCALE	DATE	FIG.
5641901	NTS	3/3/05	1

Filename: R:\Data4\7629401\Cadd Data – 7629401\Dwg\Geotech\Site location plan.dwg Date: 3/3/2005 Time: 16:29 User: jfasano Style Table: Langan.stb Layout: SLM



LEGEND:

- B-1 — BORING LOCATION
- (OW) — OBSERVATION WELL
- PROPOSED BUILDING LIMITS
- EXTENTS OF PROPOSED CELLAR

NOTES:

1. BASE PLAN TAKEN FROM TOPOGRAPHIC SURVEY PREPARED BY URS CORPORATION DATED JULY 2004. ELEVATION ARE WITH RESPECT TO NAVD 1929. THE BUILDING LOCATION IS TAKEN FROM ARHICHECTURAL DRAWINGS.
2. BORINGS WERE MADE BY SOIL TESTING, INC FROM 27 TO 30 DECEMBER 2004, UNDER THE FULL TIME INSPECTION OF LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C. BORING LOCATION ARE APPROXIMATE.
3. FOR SUBSURFACE PROFILES A, B AND C, SEE FIGURE 3.

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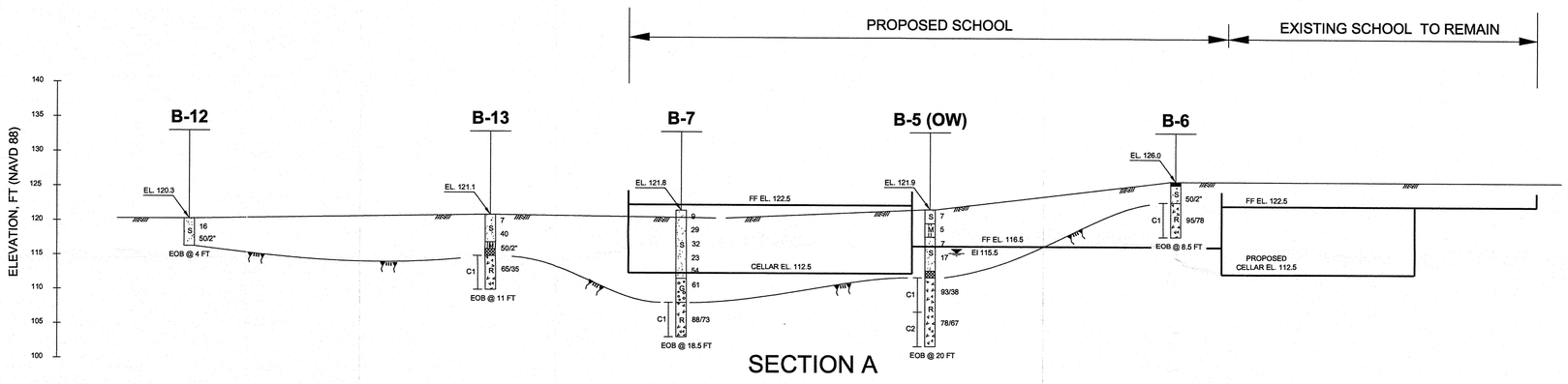
HAMILTON AVENUE SCHOOL
BORING LOCATION PLAN

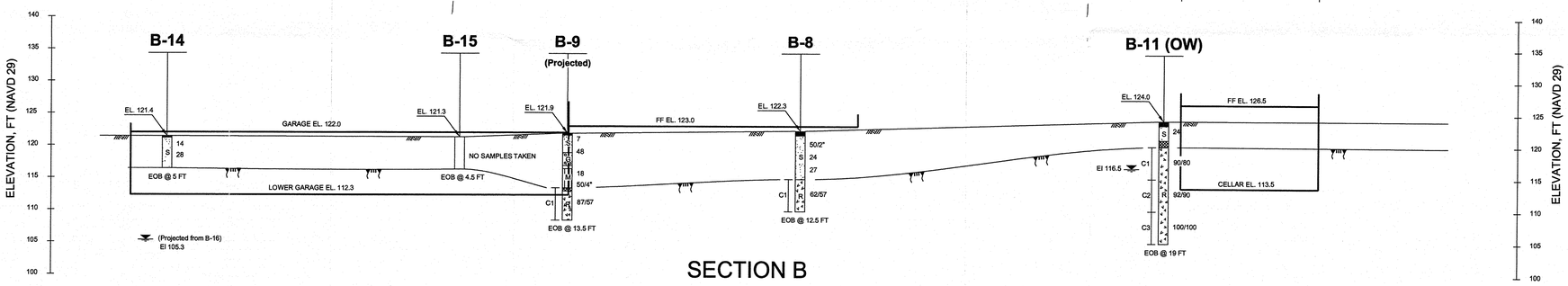
GREENWICH CONNECTICUT

Project No.	Date	Scale	Fig. No.
5641901	3/2/2005	1" = 40'	2

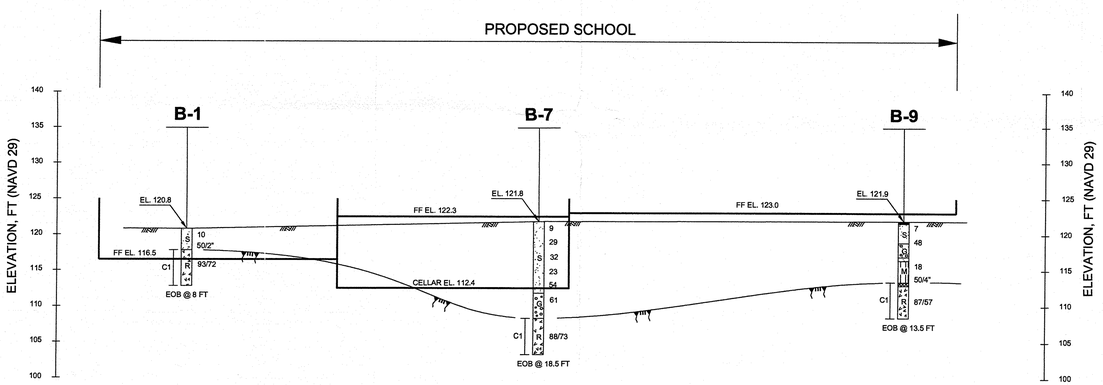
Filename: R:\Data4\7629401\Cadd Data - 7629401\Dwg\Geotech\BORING-01-12-05.dwg Date: 3/3/2005 Time: 15:35 User: jbosono Style Table: Langan.stb Layout: B Size Sheet BLP



SECTION A



SECTION B

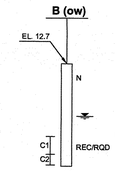


SECTION C

LEGEND

- SAND
- GRAVEL
- ROCK
- DECOMPOSED & WEATHERED ROCK
- HARDPAN
- COBBLE/BOULDER
- UNCONTROLLED FILL
- CLAY
- SILT
- ASPHALT PAVEMENT
- BRICK
- WOOD
- PROPOSED BUILDING LIMITS

BORING KEY



- B BORING IDENTIFICATION
- EL GROUND SURFACE ELEVATION AT TIME OF BORING
- N STANDARD PENETRATION RESISTANCE; NUMBER OF BLOWS OF A 140-LB HAMMER FREE FALLING 30 INCHES TO DRIVE A 2-IN O.D. SPLIT SPOON SAMPLER 12 INCHES AFTER 6 INCHES OF INITIAL PENETRATION.
- REC (LENGTH OF ROCK RETRIVED)/ (LENGTH OF ROCK CORED) * 100 %
- RQD ROCK QUALITY DESIGNATION (LENGTH OF ROCK PIECES 4 INCHES OR LONGER)/ (LENGTH OF ROCK CORED) * 100 %
- (OW) GROUNDWATER OBSERVATION WELL
- MEASURED GROUNDWATER LEVEL
- C1 ROCK CORE RUN IDENTIFICATION AND LENGTH
- EOB = END OF BORING

NOTES:

1. ELEVATIONS ARE INFERRED FROM THE TOPOGRAPHIC SURVEY PREPARED BY URS CORPORATION DATED JULY 2004. ELEVATIONS ARE REFERENCED TO NAVD 1929.
2. BORINGS WERE MADE BY SOIL TESTING INC., FROM 27 DECEMBER 2004 TO 30 DECEMBER 2004 UNDER THE FULL-TIME INSPECTION OF A LANGAN ENGINEER. A SAFETY HAMMER WAS USED TO OBTAIN ALL SOIL SAMPLES.
3. FOR BORING LOCATIONS SEE FIGURE 2.

Date	Description	No.
Revisions		

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Project

HAMILTON AVENUE SCHOOL

GREENWICH

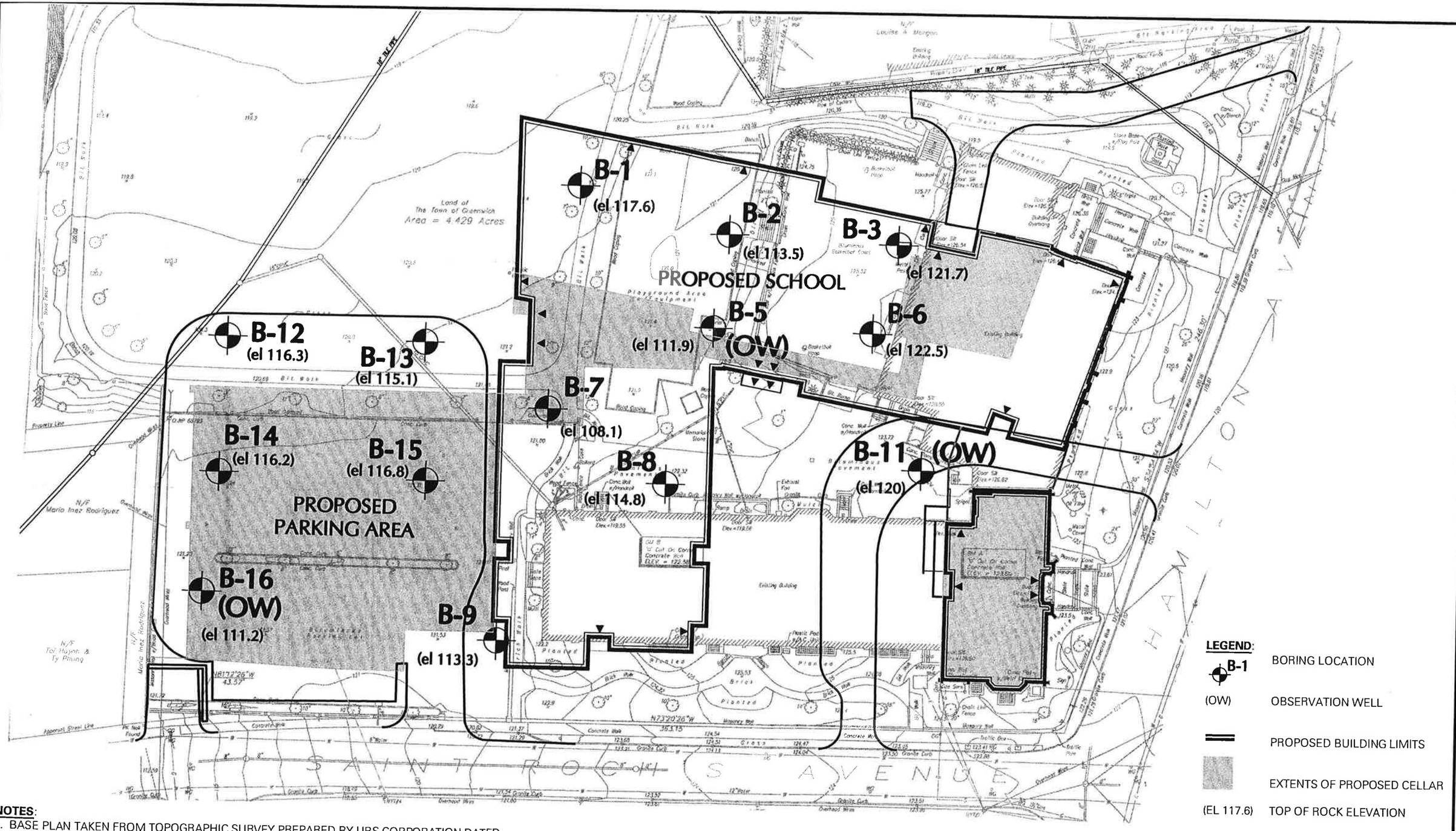
FAIRFIELD COUNTY **CONNECTICUT**

Drawing Title

SUBSURFACE PROFILES

Project No. **5641901**	Drawing No. **FIG -3**
Date **1/28/05**	
Scale **1"= 20' HORIZONTAL 1"=10' VERTICAL**	
Drn. By **JR**	
Last Revised **JTF**	Of

Filename: R:\Data4\7629401\Cadd Data – 7629401\Dwg\Geotech\SUBSURFACE PROFILES.dwg Date: 3/3/2005 Time: 17:53 User: jfasano Style Table: Langan.stb Layout: D Size Sheet (Side)



LEGEND:

B-1	BORING LOCATION
(OW)	OBSERVATION WELL
	PROPOSED BUILDING LIMITS
	EXTENTS OF PROPOSED CELLAR
(EL 117.6)	TOP OF ROCK ELEVATION

NOTES:

1. BASE PLAN TAKEN FROM TOPOGRAPHIC SURVEY PREPARED BY URS CORPORATION DATED JULY 2004. ELEVATION ARE WITH RESPECT TO NAVD 1929. THE BUILDING LOCATION IS TAKEN FROM ARHICHECTURAL DRAWINGS.

2. BORINGS WERE MADE BY SOIL TESTING, INC FROM 27 TO 30 DECEMBER 2004, UNDER THE FULL TIME INSPECTION OF LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C. BORING LOCATION ARE APPROXIMATE.

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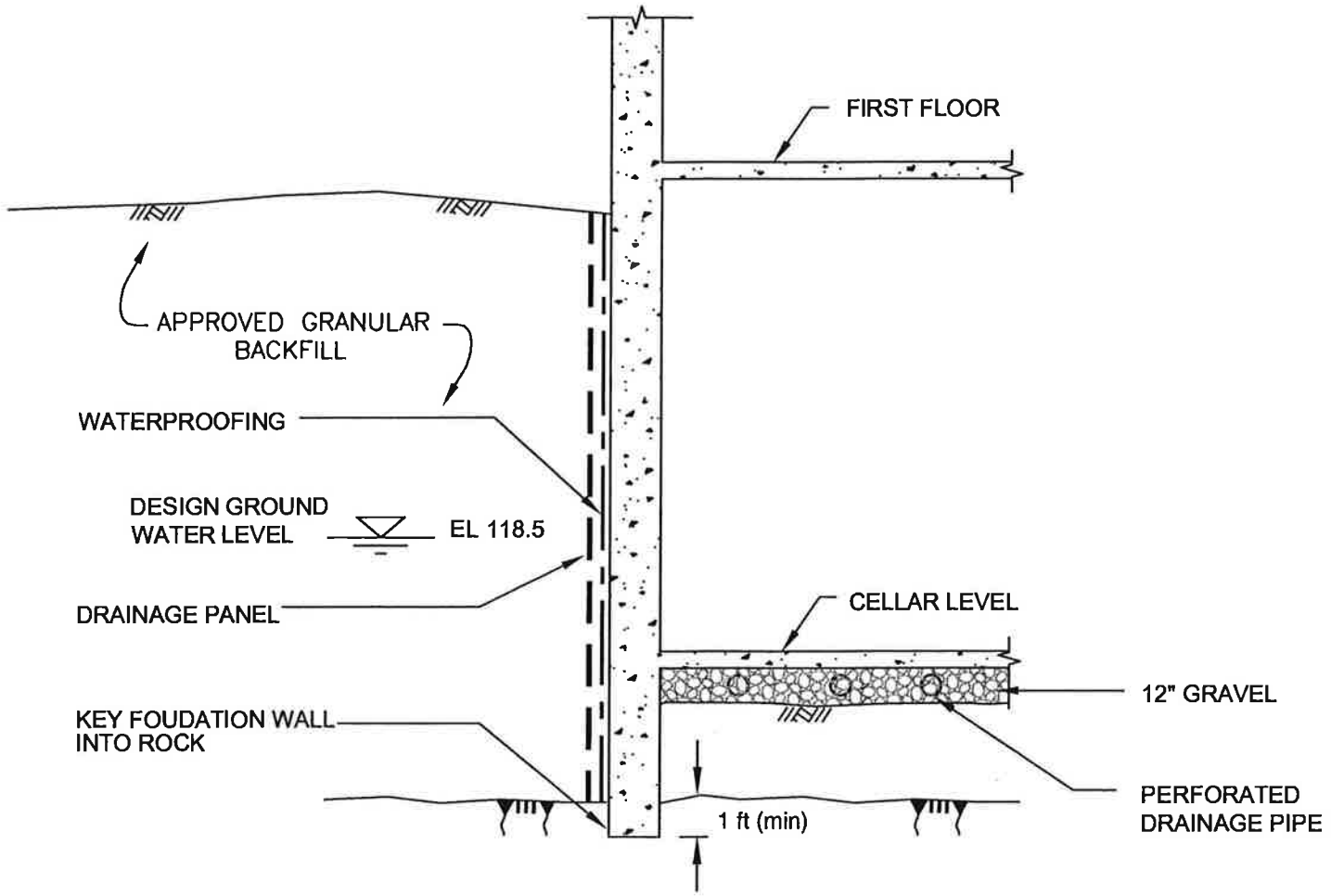
HAMILTON AVENUE SCHOOL

TOP OF BEDROCK PLAN

GREENWICH CONNECTICUT

Project No.	Date	Scale	Fig. No.
5641901	3/2/2005	1" = 40'	4

Filename: R:\Data4\7629401\Cadd Data - 7629401\Dwg\Geotech\BORING-01-12-05.dwg Date: 3/2/2005 Time: 13:45 User: jfoscaro Style Table: Langan.stb Layout: B Size Sheet Rock D



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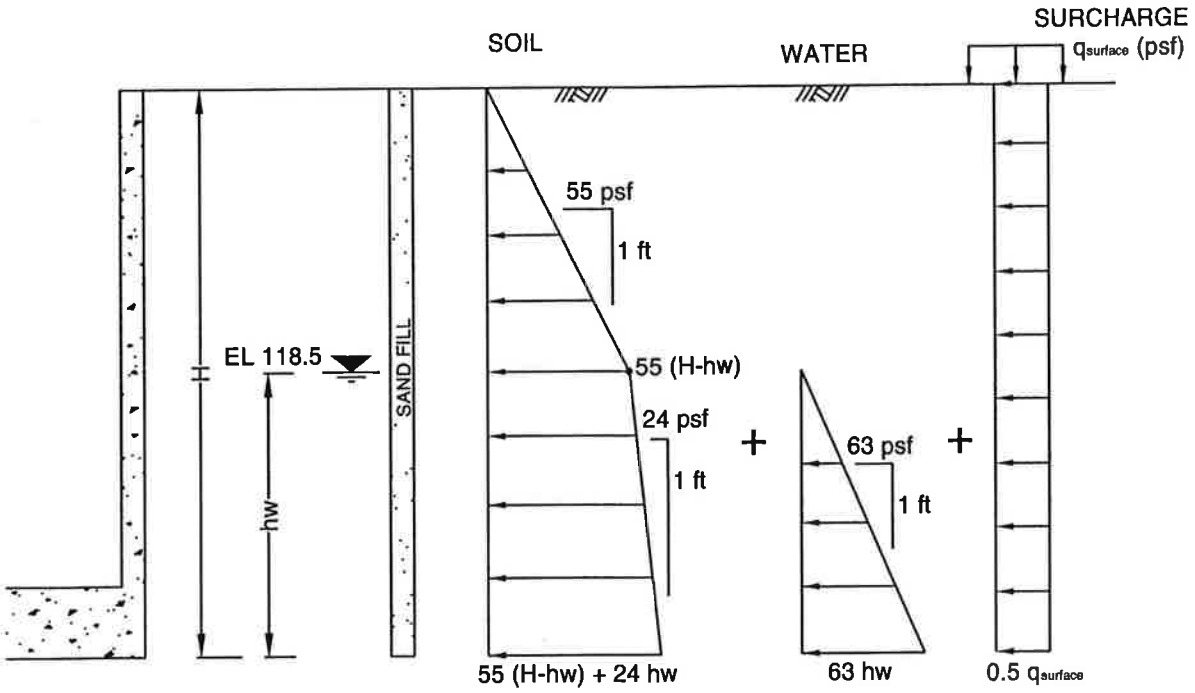
HAMILTON AVENUE SCHOOL

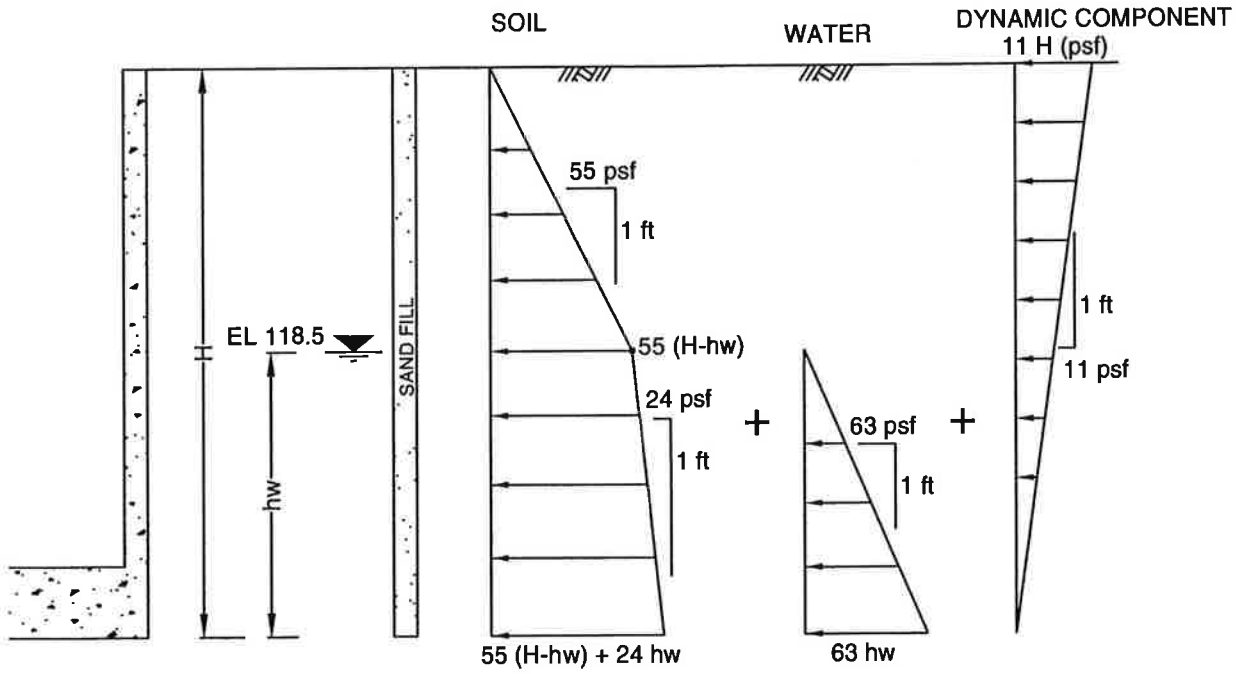
FOUNDATION DRAINAGE DETAIL

GREENWICH CONNECTICUT

Project No.	Date	Scale	Fig No.
5641901	3/2/05	NTS	5



6a. STATIC LATERAL EARTH PRESSURE



6b. DYNAMIC LATERAL EARTH PRESSURE

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HAMILTON AVENUE SCHOOL

PERMANENT LATERAL EARTH PRESSURE

GREENWICH CONNECTICUT

Project No.	Date	Scale	Fig No.
5641901	3/3/05	NTS	6

Filename: R:\Data4\7629401\Cadd Data – 7629401\Dwg\Geotech\Lateral Earth Pressures.dwg Date: 3/3/2005 Time: 13:03 User: jfasano Style Table: Langan.stb Layout: PERM. LATERAL EARTH PRESSURE

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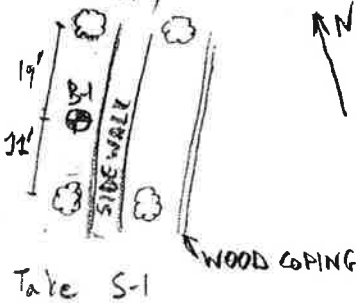
LOG OF BORING B-1 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AVE, GREENWICH, CT		ELEVATION AND DATUM: 120.8	NAVD 29
DRILLING AGENCY: SOILTESTING INC		DATE STARTED: 30 DEC 04	DATE FINISHED: 30 DEC 04
DRILLING EQUIPMENT: CME 45		COMPLETION DEPTH: 8 ft	ROCK DEPTH: 3 ft
SIZE AND TYPE OF BIT: 4 1/4" HSA		NO. SAMPLES: DIST. 2	UNDIST. CORE 5 ft
CASING: 3" SPINNING CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS	
SAMPLER: 2" OD SPLIT SPOON		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER SAFETY: WEIGHT 140 lbs	DROP 30"		

SOIL CLASS.	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO.LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BLS/6 in.
TOPSOIL	Grass & TOPSOIL Br silty m-f SAND [SM] tr f gravel [TOPSOIL]	1	S-1	SS	16"	7 5 5 5
SAND	gr m-f SAND, so gravel, tr silt [SP] JOINTS	2	S-2	SS	6"	27 50/1"
BEDROCK	White-grey, slightly weathered, slightly fractured, micaceous GNEISS	3 4 5 6 7	RUN #1 NX CORE BARREL REC = 93% RQD = 72%			TIME 7 min 7 min 7 min 8 min 8 min
	E.O.B. @ 8' Ft	8 9 10 11 12 13 14				

REMARKS
(DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)

BORING LOCATION SKETCH (SEE MAP)



- Take S-1
- Drill to 2'
- Take S-2
- Auger refusal @ 3'
- Spin casing to 3'
- Start rock coring

Run 1
REC = 56"/60" = 93%
RQD = 43"/60" = 72%

END OF BORING @ 8'

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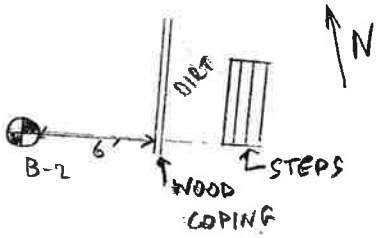
LOG OF BORING B-2 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 121.5 NAVD 29	
DRILLING AGENCY: SOILTESTING INC.		DATE STARTED: 30 DEC 04	DATE FINISHED: 30 DEC 04
DRILLING EQUIPMENT: CME 45		COMPLETION DEPTH: 8'	ROCK DEPTH: 8'
SIZE AND TYPE OF BIT: 2 1/4" HSA		NO. SAMPLES: DIST. 4	UNDIST. / CORE
CASING: 3" SPINNING CASING		WATER LEVEL: FIRST	COMPL. / 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS	
SAMPLER: 2" OD SPLIT SPOON		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: SAFETY WEIGHT 140lbs	DROP 30 inch		

SOIL GRAPHIC	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	TYPE	RECOV. FT.	PENETR. RESIST BL/6 in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
	Playground Surface						
SAND FILL	Blk-Br silty m-f SAND [SM]	1	S-1	SS	12"	2 2 3 4	BORING LOCATION SKETCH (SEE MAP)
SAND	Blk-Br gravelly c-f SAND so silt (SM)	2 3 4	S-2	SS	4"	5 18 19 11	
SILT	gr sandy SILT, tr gravel, tr clay (ML)	5	S-3	SS	16"	1 1 5 3	- Take S-1 - Drill to 2' - Take S-2 - Drill to 4' - Take S-3 - Drill to 6' - Take S-4 - Drill to 8' - Auger refusal @ 8' - END OF BORING @ 8'
	Gr SILT, so sand tr clay, tr gravel (ML)	6 7	S-4	SS	16"	3 3 3 11	
	E.O.B. @ 8' [BEDROCK]	8 9 10 11 12 13 14				50/2"	

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LOG OF BORING B-3 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVE SCHOOL		PROJECT NO: 5641901	
LOCATION: 189 HAMILTON AVE, GREENWICH, CT		ELEVATION AND DATUM: 125.7 NAVD 29	
DRILLING AGENCY: SOILTESTING, INC		DATE STARTED: DEC 27, 2004	DATE FINISHED: DEC 27, 2004
DRILLING EQUIPMENT: D-120 TRUCK MOUNTED RIG		COMPLETION DEPTH: 9 ft	ROCK DEPTH: 3 ft
SIZE AND TYPE OF BIT: 4 1/4" H.S.A.		NO. SAMPLES: DIST. 1	UNDIST. CORE 5 ft
CASING: 3" STEEL CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: MATT DEANGELLIS	
SAMPLER: 2" O.D. SPLIT SPOON / NX CORE BARREL		INSPECTOR: LOSTIS SYNGROS	
SAMPLER HAMMER: Automatic WEIGHT 140 lbs	DROP 36"		

SC	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO.	TYPE	RECOV. FT.	PENETR. RESIST BL/6 IN.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
	7" ASPHALT	1					- AUGERED THROUGH ASPHALT
SAND	Br c-f SAND, so gravel so silt [SM]	2	S-1	SS	4"	26 12 22 17	- TAKE S-1 - DRILLED TO 4' - RIG CHATTERED @ 4' - SPIN CASING @ 4' - STARTED CORING ROCK
BEDROCK	White-grey, unweathered, slightly fractured, micaceous GNEISS	3 4 5 6 7 8	RUN #1 NX CORE BARREL REC = 68% RQD = 60%			TIME 2.5 min 2.1 min 2.5 min 3.3 min 2 min	RUN #1 REC = 41"/60" = 68% RQD = 36"/60" = 60% END OF BORING @ 9'
	E.O.B @ 9 ft	9 10 11 12 13 14					

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LOG OF BORING B-5 (ow) **SHEET** 1 **OF** 2

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 121.9' NAVD 29	
DRILLING AGENCY: SOILTESTING INC		DATE STARTED: 27 DEC 04	DATE FINISHED: 28 DEC 04
DRILLING EQUIPMENT: CME45 / D-120 TRUCK MOUNTED RIG		COMPLETION DEPTH: 20'	ROCK DEPTH: 10'
SIZE AND TYPE OF BIT: 2 1/4" HSA		NO. SAMPLES: DIST. 4	UNDIST. CORE 10 ft
CASING: 3" STEEL CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS / MATT DEANGELIS	
SAMPLER: 2" O.D. SPLIT SPOON / NX CORE BARREL		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: SAFETY WEIGHT 140 lbs	DROP 30"		

SY	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO.LOC.	TYPE	RECOV. FT.	PENETR. RESIST BL/6 in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
FILL	Playing Surface Br silty m-f SAND [SM]	1	S-1	SS	4"	1 3 4 4	- STARTED DRILLING 27 DEC. WITH ALVIN JAVIS - TAKE S-1 - BIT TO 2' - TAKE S-2 - BIT TO 4' - TAKE S-3 - BIT TO 6' - TAKE S-4 - BIT TO 8' - RIG STARTED TO CHATTER @ 9' (COBBLES) - END OF D4-1 - STARTED DRILLING 28 DEC WITH MATT DEANGELIS - RIG CHATTER @ 10' - SPIN CASING TO 10'
SILT	Gr sandy SILT [ML] tr clay	3	S-2	SS	8"	2 3 2 2	
SAND	Gr silty m-f SAND [SM]	5	S-3	SS	12"	3 4 3 12	
SAND	Gr c-f SAND So silt, tr f gravel [SM]	7	S-4	SS	12"	4 5 12 50/2"	
DR	(DEC Rock)	9					
BEDROCK	Grey, unweathered, slightly fractured GNEISS (TOP 3.5')	10	RUN #1	NX CORE BARREL	REC = 93% RQD = 38%	TIME 2.5	RUN #1 REC = 56"/60" = 93% RQD = 23"/60" = 38%
		11				3.75	
		12				4	
		13				4	
		14					

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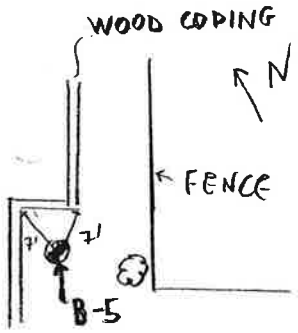
JOB NO. 5641901
DATE 28 DEC 04

LOG OF BORING NO. B-5 (ow)

SHEET 2 OF 2

SC	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BLWS/in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
BEDROCK	White-grey, unweathered, slightly fractured, micaceous GNEISS	14				5	
		15	RUN #2	NX CORE BARREL	REC = 78% RQD = 67%	3.5'	RUN #2 REC = 47"/60" = 78% RQD = 40"/60" = 67%
		16				3'	
		17				2'	
		18				2'	
		19				2'	
	EOB @ 20ft	20					END OF BORING @ 20ft PVC well installed
		21					
		22					
		23					
		24					
		25					
		26					
		27					
		28					
		29					
		30					
		31					
		32					



086100

WELL CONSTRUCTION SUMMARY

Well No. B-5

PROJECT: HAMILTON AVENUE SCHOOL	PROJECT NO.: 5641901
LOCATION: 189 HAMILTON AVE., GREENWICH CT	ELEVATION AND DATUM: 121.9 NAVD 29
DRILLING AGENCY: SOILTESTING INC.	DATE STARTED: 28 DEC 04 DATE FINISHED: 30 DEC 04
DRILLING EQUIPMENT: D-120 TRUCK MOUNTED RIG	DRILLER: MATT DEANGELIS / ALVIN JAVIS
SIZE AND TYPE OF BIT: 4 1/4" H.S.A.	INSPECTOR: KOSTIS SYNGROS

METHOD OF INSTALLATION

BORING WAS ADVANCED TO ft BY AUGERING USING A 4 1/4" H.S.A. A 3" STEEL CASING WAS SET ON TOP OF BEDROCK AT FEET. THE BORING WAS THEN ADVANCED BY ROCK CORING TO Ft. A 2" PVC SCREEN AND RISER WERE THEN INSTALLED.

METHOD OF WELL DEVELOPMENT

TYPE OF CASING: AUGER DIAMETER: 4 1/4 INCHES	TYPE OF BACKFILL MATERIAL: CLEAN SAND (#1 SILICA SAND)
TYPE OF SCREEN: PVC DIAMETER: 2 INCHES	TYPE OF SEAL MATERIAL: BENTONITE CHIPS
BOREHOLE DIAMETER: 12 inches to 10 Ft, 3 inches to 20 Ft	TYPE OF FILTER MATERIAL: CLEAN SAND (#1 SILICA SAND)

	ELEVATION	DEPTH (ft)
TOP OF CASING		0
TOP OF SEAL		6 Ft
TOP OF FILTER		8 Ft
TOP OF SCREEN		10 Ft
BOTTOM OF BORING		20 ft

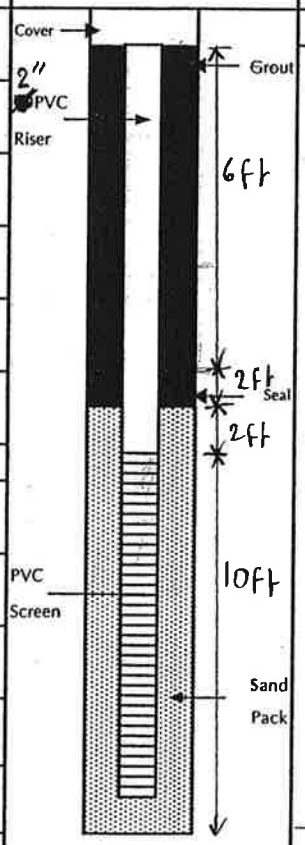
SCREEN LENGTH: 10 ft

SLOT SIZE: 0.02 inch

GROUNDWATER ELEVATIONS

ELEVATION	DATE	DEPTH TO WATER
	1/20/05	No well Found
115.5	3/1/05	6.4 ft

WELL DETAILS



SUMMARY SOIL CLASSIFICATION	DEPTH (FT)
Br silty m-f SAND	2.0
Gr Clayey SILT	4.0
Gr m-f SAND	8.0
COBBLES	9.0
	10.0
Gr, unweathered slightly fractured GNEISS	13.5
Wh-Gr, unweathered, slightly fractured, micaceous GNEISS	20

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LANGAN Engineering and Environmental Services, Inc.
River Drive Center 1, Elmwood Park, NJ 07407

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LOG OF BORING B-6 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 126.0 NAVD 29	
DRILLING AGENCY: SOILTESTING INC.		DATE STARTED: 27 DEC 2004	DATE FINISHED: 27 DEC 2004
DRILLING EQUIPMENT: D-120 TRUCK MOUNTED RIG		COMPLETION DEPTH: 8.5'	ROCK DEPTH: 3.5
SIZE AND TYPE OF BIT: 4 1/4" H.S.A.		NO. SAMPLES: DIST. 1	UNDIST. CORE 5 ft
CASING: 3" STEEL CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: MATT DEANGELIS	
SAMPLER: 2" O.D. SPLIT SPOON / NX CORE BARREL		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: AUTOMATIC WEIGHT 140 lbs	DROP 36"		

	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BLWS/in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
	7 inches ASPHALT						
SAND	Br c-f silty SAND, tr gravel [SM]	1 2 3	S-1	SS	7"	8 7 50/2"	- TAKE S-1 - BIT TO 3' - RIG STARTED TO CHATTER @ 3.5' - STARTED ROCK CORING - LOST WATER @ 4'
BEDROCK	White-grey, unweathered, slightly fractured, micaceous GNEISS	4 5 6 7 8	RUN #1 NX CORE BARREL REC = 95% RQD = 78%			TIME 1.75' 2.5' 3.5' 3.5' 3.25'	RUN #1 REC = 57"/60" = 95% RQD = 47"/60" = 78%
	E.O.B @ 8.5 ft	9 10 11 12 13 14					END OF BORING @ 8.5'

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LOG OF BORING B-7 **SHEET** 1 **OF** 2

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AVE., GREENWICH, CT		ELEVATION AND DATUM: 121.8 NAVD 29	
DRILLING AGENCY: SOILTESTING INC.		DATE STARTED: 29 DEC 04	DATE FINISHED: 30 DEC 04
DRILLING EQUIPMENT: CME 45		COMPLETION DEPTH: 18.5 ft	ROCK DEPTH: 13.5 ft
SIZE AND TYPE OF BIT: 2 1/4" HSA		NO. SAMPLES: DIST. 6	UNDIST. CORE 5 ft
CASING: 3" SPINNING CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS	
SAMPLER: 2" O.D. SPLIT SPOON		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER SAFETY: WEIGHT 140 lbs	DROP 30"		

SC	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	TYPE	RECOV. FT.	PENETR. RESIST BL/6 In.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
TOPSOIL	Grass & TOPSOIL						- Take S1
	Br silty m-f SAND, tr vegetation [SM] (Topsoil)	1	S-1	SS	16"	7 3 6 16	- BIT TO 2'
SAND	Br m-f silty SAND [SM]	2					- Take S2
		3	S-2	SS	16"	20 16 13 7	- BIT TO 4'
		4					- Take S3
	Br-Gr silty m-f SAND (TOP) [SM] 4" LAYER of BLK c-f SAND (BOTTOM) [SP] Br-Gr silty m-f SAND (NOT SAMPLED) [SM]	5	S-3	SS	14"	26 21 11 6	- BIT TO 6'
		6					- Take S4
	Br c-f SAND, so silt [SM]	7	S-4	SS	14"	7 10 13 10	- BIT TO 8'
		8					- Take S5
	Br c-f SAND, so silt (TOP 12") [SM]	9	S-5	SS	18"	3 18 36 20	- BIT TO 10'
GRAVEL	c-f Gravel (BOTTOM 6") [GP]						
	Br silty SAND (TOP 6") [SM]	10	S-6	SS	10"	20 30 31 60	- Take S6
GRAVEL	c-f Gravel (NOT SAMPLED) [GP]	11					
		12					- BIT TO 13.5'
DR	DEC ROCK	13					- AUGER REFUSAL @ 13.5' - INSTALLED CASING @ 13'
		14				TIME	

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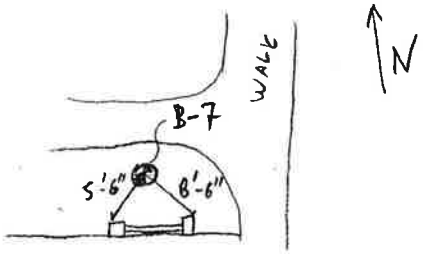
JOB NO. 5641901
DATE 30 DEC 04

LOG OF BORING NO. B-7

SHEET 2 OF 2

SC	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BLWS/FT.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
BEDROCK	Grey-Brown, slightly whathered, slightly fractured GNEISS	14	RUN #1	NX CORE BARREL		5'-40"	RUN #1
		15				6'-50"	REC = 53"/60" = 88%
		16				7'	RQD = 44"/60" = 73%
		17				8'-40"	
	White-Grey, unweathered, slightly fractured, micaceous GNEISS	18				7'	
	END OF BORING @ 18.5 ft	19					END OF BORING @ 18.5'



(SEE MAP)

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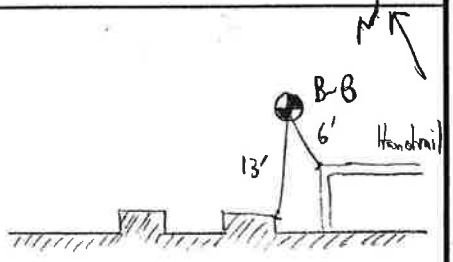
LOG OF BORING B-8 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVE SCHOOL	PROJECT NO.: 5641901
LOCATION: 189 HAMILTON AV., GREENWICH, CT	ELEVATION AND DATUM: 122.3 NAVD 29
DRILLING AGENCY: SOILTESTING INC	DATE STARTED: 28 DEC 04 / DATE FINISHED: 28 DEC 04
DRILLING EQUIPMENT: CME 45	COMPLETION DEPTH: 12.5 ft / ROCK DEPTH: 7.5 ft
SIZE AND TYPE OF BIT: 2 1/4" H.S.A.	NO. SAMPLES: DIST. 3 / UNDIST. / CORE 5'
CASING: 3" SPINNING CASING	WATER LEVEL: FIRST / COMPL. / 24 HR.
CASING HAMMER: WEIGHT N/A / DROP N/A	FOREMAN: ALVIN JAVIS
SAMPLER: 2" O.D. SPLIT SPOON	INSPECTOR: KOSTIS SYNGROS
SAMPLER HAMMER SAFETY: WEIGHT 140 Cbs / DROP 30"	

SV	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO.LOC.	TYPE	RECOV. FT.	PENETR. RESIST BL/6 in.
	7.5" ASPHALT	1				
SAND	Gr m-f SAND, tr silt [SP] GRAVEL AT THE BOTTOM (NOT SAMPLED)	2	S-1	SS	4"	10 61 50/4"
SAND	Br silty m-f SAND [SM]	3 4 5	S-2	SS	4"	7 7 17 22
SAND	Br silty mf SAND [SM]	6	S-3	SS	4"	8 4 23 50/4"
DR	DEC ROCK JOINTS	7				
BEDROCK	White-Grey, unweathered, slightly fractured, micaceous GNEISS	8 9 10	RUN #1 NX CORE BARREL REC= 62% RQD= 57%			TIME 4'10" 4' 5'
BEDROCK	Red-Brown, slightly weathered, moderately fractured GNEISS	11				5'10"
BEDROCK	White-Grey, slightly weathered, moderately fractured, micaceous GNEISS	12				6"
	E.O.B. @ 12.5ft	13 14				

REMARKS
(DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)



- Take S1
- BIT TO 3'
- TAKE S2
- BIT TO 5'
- TAKE S3
- AUGER REFUSAL @ 7.5'
- INSTALL CASING TO 7'
- START CORING ROCK

RUN #1

REC = 37"/60" = 62%
RQD = 34"/60" = 57%

END OF BORING @ 12.5'

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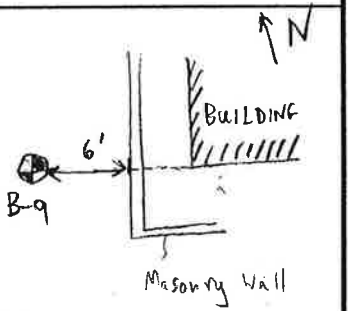
LOG OF BORING B-9 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 121.9 NAVD 29	
DRILLING AGENCY: SOILTESTING INC		DATE STARTED: 29 DEC 04	DATE FINISHED: 30 DEC 04
DRILLING EQUIPMENT: CME 45		COMPLETION DEPTH: 13.5 Ft	ROCK DEPTH: 8.5 Ft
SIZE AND TYPE OF BIT: 2 1/4" H.S.A		NO. SAMPLES: DIST. 4	UNDIST. CORE 5 Ft
CASING: 3" SPINNING CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS	
SAMPLER: 2" O.D. SPLIT SPOON		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: SAFETY WEIGHT 140 lbs	DROP 30"		

SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	TYPE	RECOV. FT.	PENETR. RESIST BLOWS/ft.
3.5" ASPHALT					
SILT — Br sandy SILT, tr gravel [ML]	1	S-1	SS	16"	5 3 4 14
SAND — gr c-f SAND, so gravel (TOP 3") [SW]	2				
Gravel — c-f GRAVEL, sm wheathered rock (SAMPLED) [GP]	3	S-2	SS	6"	9 5 43 31
	4				
SILT — Br m-f silty SAND (TOP 4") [SM]	5	S-3	SS	18"	5 8 10 9
Gr SILT, sm clay (BOTTOM 12") [ML]	6				
Br-Gr SILT, sm clay (TOP 4") [ML]	7	S-4	SS	10"	38 50/4
PR DEC ROCK	8				
BEDROCK — White-Grey, slightly weathered, moderately fractured, micaceous GNEISS	9	RUN #1 NX CORE BARREL REC = 87% RQD = 57%			TIME 5'
	10				5'
	11				6'
	12				6'
	13				7'
E.O.B. @ 13.5 ft	14				

REMARKS
(DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)



- TAKE S1
- BIT TO 2'
- TAKE S2
- BIT TO 4'
- RIG STARTED TO CHATTER.. AUGER TO 5' (Hard - possibly cobbles)
- BIT TO 5'
- TAKE S-3
- BIT TO 7'
- TAKE S-4
- RIG STARTED TO CHATTER @ 8.5'
- STARTED ROCK CORING

RUN # 1

REC = 52"/60" = 87%

RQD = 34"/60" = 57%

END OF BORING @ 13.5'

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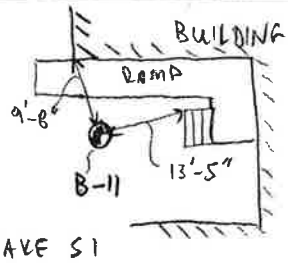
LOG OF BORING B-11 (OW) **SHEET** 1 **OF** 2

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 124.0 NAVD 29	
DRILLING AGENCY: SOILTESTING INC		DATE STARTED: 28 DEC 04	DATE FINISHED: 28 DEC 04
DRILLING EQUIPMENT: D-120 TRUCK MOUNTED RIG		COMPLETION DEPTH: 19 ft	ROCK DEPTH: 4 ft
SIZE AND TYPE OF BIT: 4 1/4" H.S.A.		NO. SAMPLES: DIST. 1	UNDIST. CORE 15 ft
CASING: 3" STEEL CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: MATT DEANGELIS	
SAMPLER: 2" O.D. SPLIT SPOON / NX CORE BARREL		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: AUTOMATIC WEIGHT 140 lbs	DROP 36"		

SOIL CLASS	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO.LOC.	TYPE	RECOV. FT.	PENETR. RESIST BLG in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
	7.5 inches ASPHALT						
SAND	Br silty m-f SAND, tr gravel [SM]	1–3	S-1	SS	6"	8 8 16 50/2"	
DR	(DEC Rock)	4					TIME
BEDROCK	White-Grey, slightly weathered, slightly fractured, micaceous GNEISS	5–8	RUN #1	NX CORE BARREL	REC = 90% RQD = 80%	3.5' 3.5' 3.5' 4' 4'	
BEDROCK	White-Grey, unweathered, unfractured, micaceous GNEISS	9–13	RUN #2	NX CORE BARREL	REC = 92% RQD = 90%	4.5' 4.5' 4.5' 4.5' 4.5'	
		14					



- TAKE S1
- BIT TO 4'
- RIG STARTED TO CHATTER @ 4'
- STARTED ROCK CORING

RUN #1

REC = 54"/60" = 90%

RQD = 48"/60" = 80%

RUN #2

REC = 55"/60" = 92%

RQD = 54"/60" = 90%

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JOB NO. 5641901
DATE 28 DEC 04

LOG OF BORING NO. B-11 (OW)
SHEET 2 OF 2

	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BL/6 in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
BEDROCK	White - Grey, unweathered, unfractured micaceous GNEISS	14 15 16 17 18 19	RUN #3	NX CORE BARREL	REC = 100% RQD = 100%	5' 5' 5' 5' 5'	RUN #3 REC = 60"/60" = 100% RQD = 60"/60" = 100%
	E.O.B. @ 19 Ft						END OF BORING @ 19' Install well

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LOG OF BORING B-12 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 120.3 NAVD 29	
DRILLING AGENCY: SOILTESTING INC.		DATE STARTED: 27 DEC 04	DATE FINISHED: 27 DEC 04
DRILLING EQUIPMENT: CME 45		COMPLETION DEPTH: 4 Ft	ROCK DEPTH: 4 Ft
SIZE AND TYPE OF BIT: 2 1/4" H.S.A.		NO. SAMPLES: DIST. 2	UNDIST. / CORE
CASING: 3" STEEL CASING		WATER LEVEL: FIRST	COMPL. / 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS	
SAMPLER: 2" O.D. SPLIT SPOON		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: SAFETY WEIGHT 140"	DROP 30"		

SOIL CLASS	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BLOWS/6 in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
TOPSOIL, SAND	Grass & Topsoil Gr-Br silty m-f SAND [SM] (TOPSOIL)	1	S-1	SS	16"	2 4 5 5	- TAKE S1 - BIT TO 2' - TAKE S2 - BIG CHATTERED @ 4'
	Br silty m-f SAND [SM]	2					
DR.	DEC ROCK	3	S2	SS	2"	50/2"	
BEDROCK	E.O.B. @	4					END OF BORING @ 4'
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					

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LOG OF BORING B-13 **SHEET** 1 **OF** 2

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 121.1 NAVD 29	
DRILLING AGENCY: SOILTESTING INC.		DATE STARTED: 27 DEC 04	DATE FINISHED: 27 DEC 04
DRILLING EQUIPMENT: CME 45, D-120 TRUCK MOUNTED RIG		COMPLETION DEPTH: 11 ft	ROCK DEPTH: 6 ft
SIZE AND TYPE OF BIT: 2 1/4" / 4 1/4"		NO. SAMPLES: DIST. 3	UNDIST. CORE 5 ft
CASING: 3" STEEL CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS / MATT DEANGELIS	
SAMPLER: 2" O.D. SPLIT SPOON		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: SAFETY WEIGHT 140 lbs	DROP 30"		

SOIL CLASS	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	TYPE	RECOV. FT.	PENETR. RESIST BL/6 in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
TOPSOIL	Grass & Topsoil Br m-f SAND [SM] so silt, tr gravel (topsoil)	1	S-1	SS	14"	4 4 3 8	-TAKE S1 (STARTED WITH JAVIS) - BIT TO 2' - TAKE S2
SAND	Br silty m-f SAND [SM]	2 3	S-2	SS	6"	15 25 15 12	- BIT TO 4' - TAKE S3 - RIG CHATTERED @ 6' - CONTINUED WITH DEANGELIS
SILT	Br SILT, sm m-f sand [ML]	4 5	S-3	SS	4"	3 50/4"	-INSTALLED 6' CASING - STARTED ROCK CORING
BR	(DEC ROCK)						
BEDROCK	White-grey, slightly weathered, moderately fractured, micaceous GNEISS JOINTS	6 7 8 9 10	RUN #1 NX CORE BARREL REC = 65% RQD = 35%			TIME 3' 3' 3' 2'30" 3'	RUN #1 REC = 39"/60" = 65% RQD = 21"/60" = 35%
	E.O.B. @ 11 ft	11 12 13 14					END OF BORING @ 11'

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LOG OF BORING B-14 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 121.4± NAVD 29	
DRILLING AGENCY: SOILTESTING INC		DATE STARTED: 27 DEC 04	DATE FINISHED: 27 DEC 04
DRILLING EQUIPMENT: CME 45		COMPLETION DEPTH: 5 ft	ROCK DEPTH: 5 ft
SIZE AND TYPE OF BIT: 2 1/4" H.S.A.		NO. SAMPLES: DIST. 2	UNDIST. / CORE
CASING: 3" STEEL CASING		WATER LEVEL: FIRST	COMPL. / 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS	
SAMPLER: 2" O.D. SPLIT SPOON		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: SAFETY WEIGHT 140 lbs	DROP 30"		

SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BL/6 in.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
3" ASPHALT						- BIT TO 1'
						- TAKE S1
Blk m-f SAND, little silt, little m-f gravel [SP]	1	S-1	SS	4"	10 6 8	- BIT TO 3'
	2					- TAKE S2
	3				50/4"	- RIG STARTED TO CHATTER @ 5'
Blk m-f SAND, little silt, little m-f gravel [SP]	4	S-2	SS	4"	45 15 13	
	5				50/4"	
E.O.B. @ 5 ft	6					END OF BORING @ 5'
BEDROCK	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					

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LOG OF BORING B-15 **SHEET** 1 **OF** 1

PROJECT: HAMILTON AVENUE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 121.3 NAVD 29	
DRILLING AGENCY: SOILTESTING INC.		DATE STARTED: 27 DEC 04	DATE FINISHED: 27 DEC 04
DRILLING EQUIPMENT: CME 45		COMPLETION DEPTH: 4.5'	ROCK DEPTH: 4.5'
SIZE AND TYPE OF BIT: 2 1/4" H.S.A		NO. SAMPLES: DIST. — UNDIST. — CORE —	
CASING: 3" STEEL CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: ALVIN JAVIS	
SAMPLER: 2" O.D. SPLIT SPOON		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER: SAFETY WEIGHT 140 LBS	DROP 30"		

	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BLOWS/ft.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
	Asphalt	1 2 3 4					- DRILLED TO BEDROCK WITHOUT TAKING ANY SAMPLES - RIG CHATTERED @ 4.5'
BEDROCK	E.O.B. @ 4.5 ft	5 6 7 8 9 10 11 12 13 14					END OF BORING @ 4.5'

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

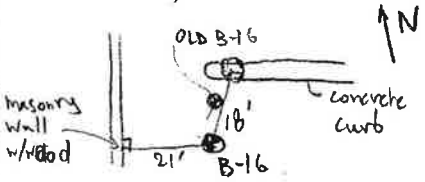
LOG OF BORING B-16 (OW) **SHEET** 1 **OF** 2

PROJECT: HAMILTON AVE SCHOOL		PROJECT NO.: 5641901	
LOCATION: 189 HAMILTON AV., GREENWICH, CT		ELEVATION AND DATUM: 121.2 NAVD 29	
DRILLING AGENCY: SOILTESTING INC.		DATE STARTED: 30 DEC 04	DATE FINISHED: 30 DEC 04
DRILLING EQUIPMENT: D-120 TRUCK MOUNTED RIG		COMPLETION DEPTH: 20 ft	ROCK DEPTH: 10 ft
SIZE AND TYPE OF BIT: 4 1/4" HSA		NO. SAMPLES: DIST. 2	UNDIST. CORE 10 ft
CASING: 3" SPINNING CASING		WATER LEVEL: FIRST	COMPL. 24 HR.
CASING HAMMER: WEIGHT N/A	DROP N/A	FOREMAN: MATT DEANGELLIS	
SAMPLER: 2" O.D. SPLIT SPOON / NX CORE BARREL		INSPECTOR: KOSTIS SYNGROS	
SAMPLER HAMMER SAFETY: WEIGHT 140 lbs	DROP 36"		

SC	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	TYPE	RECOV. FT.	PENETR. RESIST BLOWS/ft.
	6" ASPHALT					
SAND	gr m-f SAND, sm silt, tr gravel [SP]	1	S-1	SS	4"	15 27 12
		2	S-2	SS	No Recovery	21 23 50/4"
	DENSE COBBLES / Gravel / Boulder?	4				
SAND	Br silty m-f SAND	5				
	JOINTS	8	S-3	SS		1 1 50/2"
BEDROCK	White-Grey, slightly weathered, moderately fractured, micaceous GNEISS	10	RUN #1 NX CORE BARREL REC = 95% RQD = 30%			TIME 2.5 min 3 min 3 min 3 min
		14				

REMARKS
(DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)

BORING LOCATION SKETCH (SEE MAP)



- Take S-1
- Drill to 2'
- Take S-2
- Spoon Refusal. Augered to 8'.
- Tightly packed cobbles btw 4'-5'
- Take S-3

- Auger refusal @ 10'
- Spin casing to 10'
- Started rock coring.

RUN #1
REC = 57"/60" = 95%
RQD = 18"/60" = 30%

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

JOB NO. 5641901
DATE 30 DEC 2004

LOG OF BORING NO. B-16 (OW)

SHEET 2 OF 2

SC	SAMPLE DESCRIPTION	DEPTH SCALE	SAMPLES NO./LOC.	SAMPLES TYPE	SAMPLES RECOV. FT.	SAMPLES PENETR. RESIST BLOWS/FT.	REMARKS (DRILLING FLUID, DEPTH OF CASING, CASING BLOWS, FLUID LOSS, ETC.)
BEDROCK	White-Grey, slightly weathered, moderately fractured, micaceous GNEISS gravel	14	RUN#1			4 min	
		15	RUN #2	NX CORE BARREL	REC=100% RQD=55%	4 min	RUN #2. REC=60"/60"=100%. RQD=33"/60"=55%.
		16				4 min	
		17				4 min	
		18				2.5 min	
		19				2.5 min	END OF BORING @ 20'
		20					
	E.O.B. @ 20ft	21					Install PVC WELL

086100

WELL CONSTRUCTION SUMMARY

Well No. B-16 (OW)

PROJECT: HAMILTON AVENUE SCHOOL	PROJECT NO.: 5641901
LOCATION: 189 HAMILTON AVE., GREENWICH, CT	ELEVATION AND DATUM: 121.2 NAVD 29
DRILLING AGENCY: SOILTESTING INC.	DATE STARTED: 30 DEC 04 DATE FINISHED: 30 DEC 04
DRILLING EQUIPMENT: D-120 TRUCK MOUNTED RIG	DRILLER: MATT DEANGELIS
SIZE AND TYPE OF BIT: 4 1/4" H.S.A.	INSPECTOR: KOSTIS SYNGROS

METHOD OF INSTALLATION

BORING WAS ADVANCED TO ft BY AUGERING USING A 4 1/4" H.S.A. A 3" STEEL CASING WAS SET ON TOP OF BEDROCK AT FEET. THE BORING WAS THEN ADVANCED BY ROCK CORING TO Ft. A 2" PVC SCREEN AND RISER WERE THEN INSTALLED.

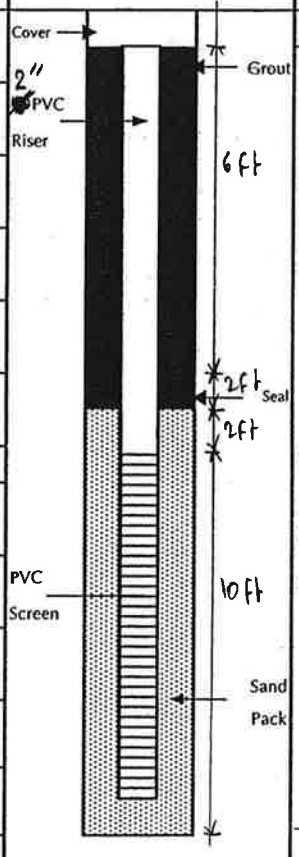
METHOD OF WELL DEVELOPMENT

TYPE OF CASING: AUGER DIAMETER: 4 1/4 IN	TYPE OF BACKFILL MATERIAL: CLEAN SAND (#1 SILICA SAND)
TYPE OF SCREEN: PVC DIAMETER: 2 INCHES	TYPE OF SEAL MATERIAL: BENTONITE CHIPS
BOREHOLE DIAMETER: 12 inches to 10 ft, 3 inches to 20 ft	TYPE OF FILTER MATERIAL: CLEAN SAND (#1 SILICA SAND)
TOP OF CASING ELEVATION: DEPTH (ft): 0	
TOP OF SEAL ELEVATION: DEPTH (ft): 6 ft	
TOP OF FILTER ELEVATION: DEPTH (ft): 8 ft	
TOP OF SCREEN ELEVATION: DEPTH (ft): 10 ft	
BOTTOM OF BORING ELEVATION: DEPTH (ft): 20 ft	
SCREEN LENGTH: 10 ft	
SLOT SIZE: 0.02 inches	

GROUNDWATER ELEVATIONS

ELEVATION	DATE	DEPTH TO WATER
105.1	1/20/05 12:30pm	16.1 ft
105.3	3/1/05	15.9 ft

WELL DETAILS



SUMMARY SOIL CLASSIFICATION	DEPTH (FT)
gr m-f SAND, sm silt, sm gravel	4.0
COBBLES	5.0
Br silty m-f SAND	
	10.0
Wh-Gr, slightly weathered, moderately fractured, micaceous GNEISS	
	20

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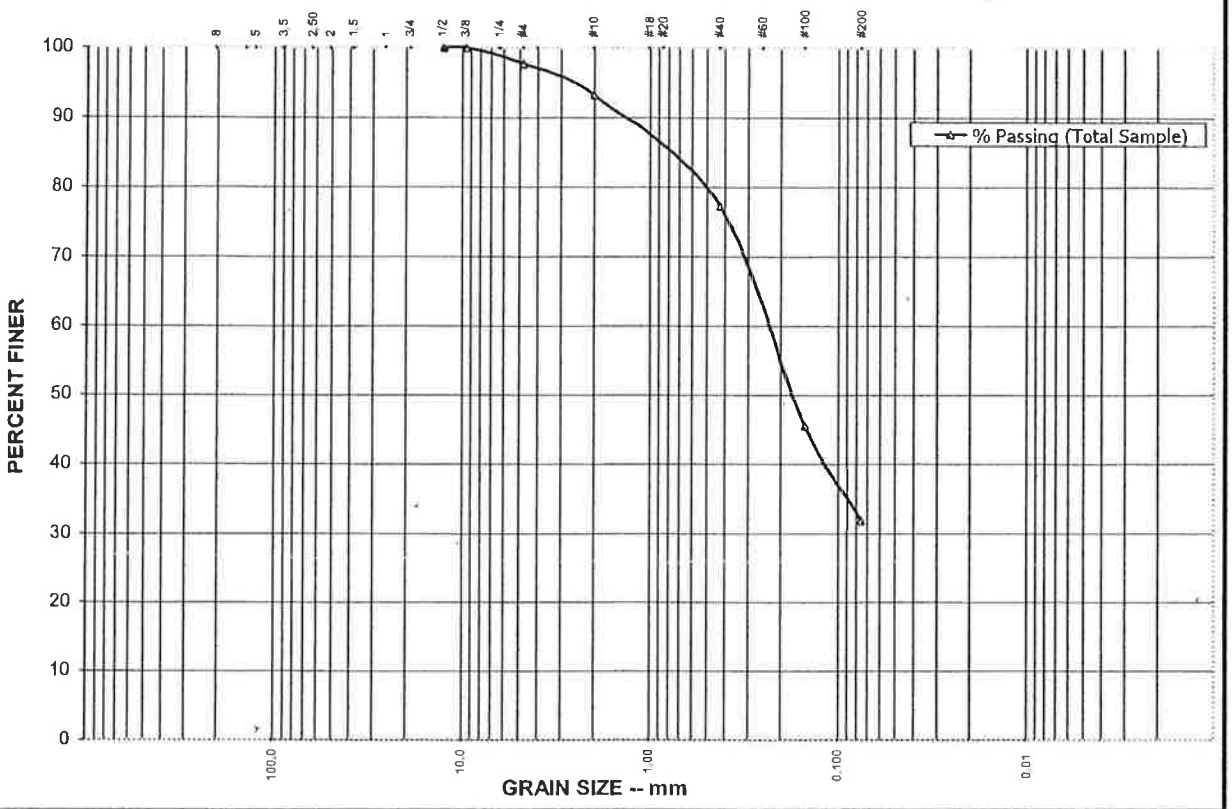
LANGAN Engineering and Environmental Services, Inc.
River Drive Center 1, Elmwood Park, NJ 07407

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		6.9	24.1	69.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	2.3	% Sand		65.9	31.8	

Classification: BROWN C-F SAND, some Silt, trace Fine Gravel **(Natural moisture upon reciept = 15.9%)**

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"					
12.5	1/2"	0.00	100.0			
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	5.00	97.7			
2.00	#10	15.00	93.2			
0.85	#20					
0.425	#40	50.00	77.3			
0.250	#60					
0.150	#100	120.00	45.5			
0.075	#200	150.00	31.8			

Total Dry Wt. 220
Split Wt.

Project:	LANGAN ENGINEERING	Project No.:	02227L	Date:	1/17/2005
City:	New Haven,CT	Specification:	Not Provided	Lab No:	C1552-05
Source:	001, B-1, 0'-2'	Sampled from:	Provided by client, Job # 56419		

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks:

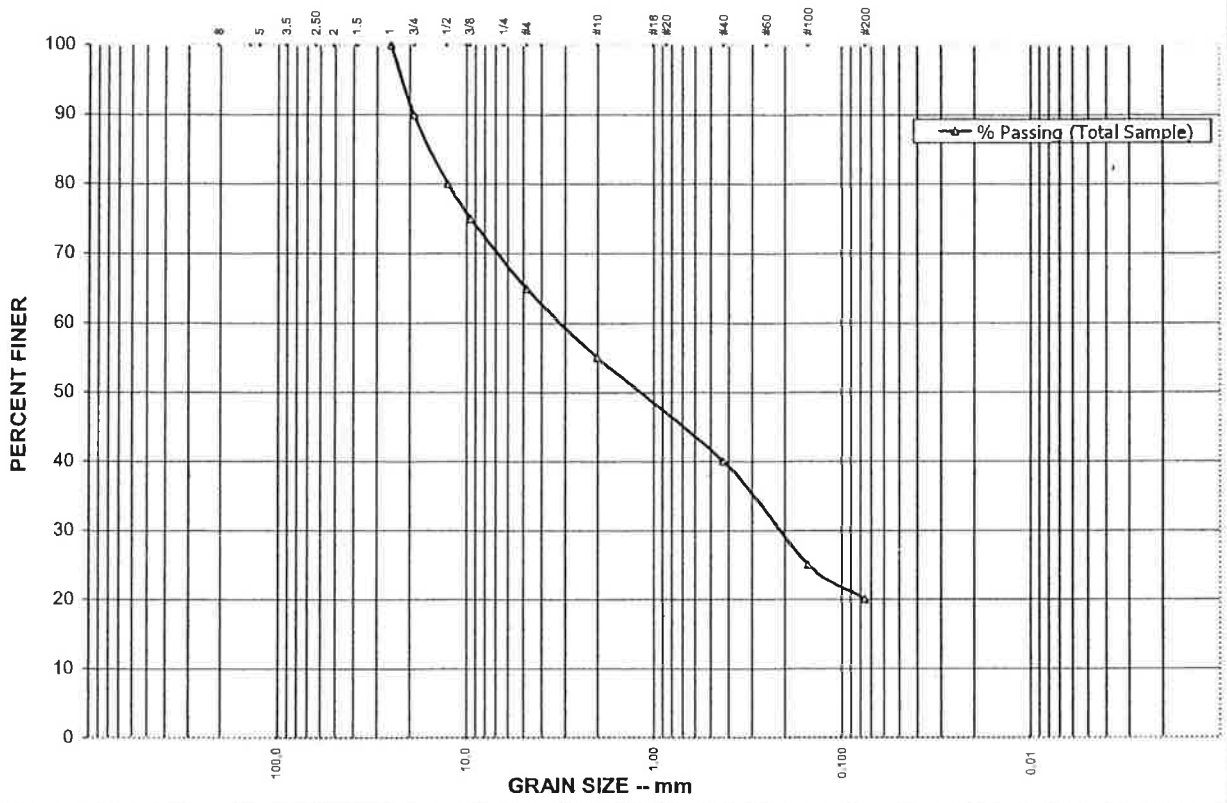
Tested By: M.F. Date: 1/18/2005

Reviewed By: Date: 1/19/05

ASTM C136GSP1, Rev. 4

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		22.2	33.3	44.4	Silt (>0.002mm)	Clay (<0.002mm)
0.0	35.0		% Sand	45.0	20.0	

Classification: BROWN C-F SAND and Gravel, Some Silt **(Natural moisture upon reciept = 15.0%)**

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	10.00	90.0			
12.5	1/2"	20.00	80.0			
9.5	3/8"	25.00	75.0			
6.3	1/4"					
4.75	#4	35.00	65.0			
2.00	#10	45.00	55.0			
0.85	#20					
0.425	#40	60.00	40.0			
0.250	#60					
0.150	#100	75.00	25.0			
0.075	#200	80.00	20.0			

Total Dry Wt. 100
Split Wt.

Project:	LANGAN ENGINEERING	Project No.:	02227L	Date:	1/17/2005
City:	New Haven,CT	Specification:	Not Provided	Lab No:	C1547-05
Source:	002, B-2, 2'-4'	Sampled from:	Provided by client, Job # 56419		

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks:

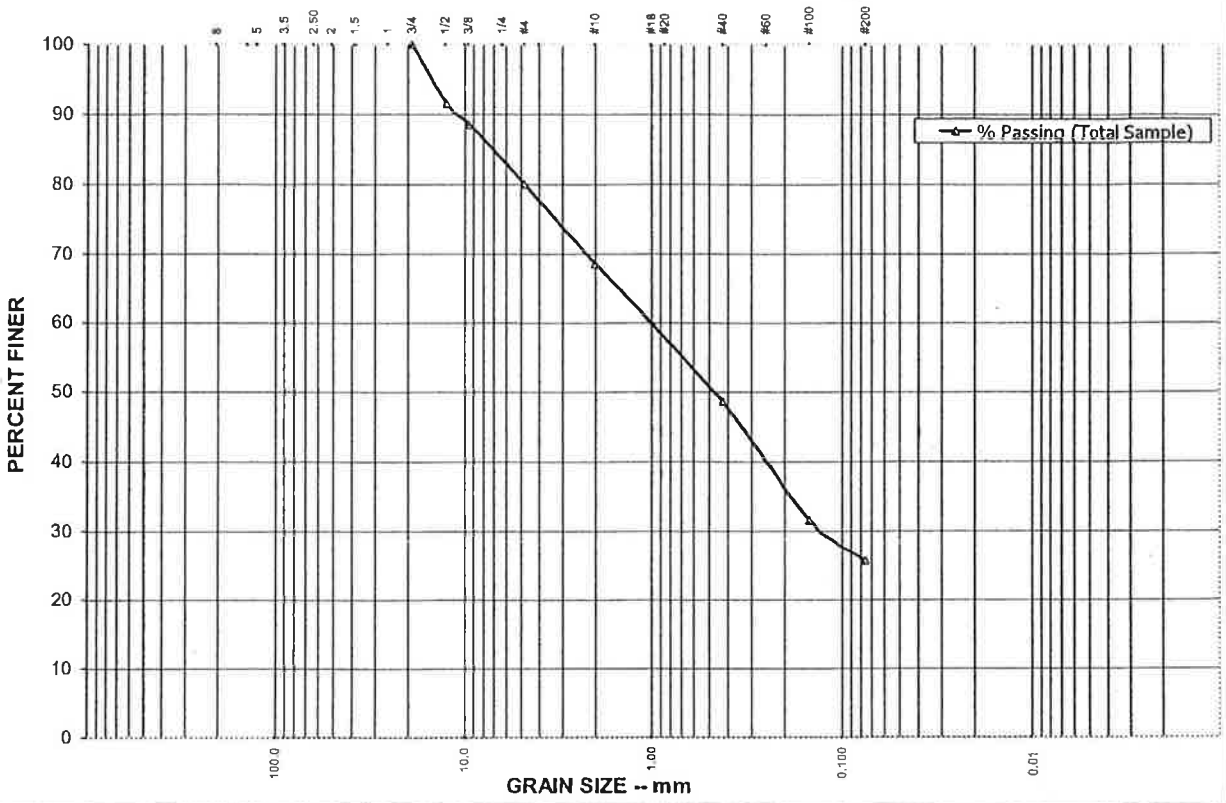
Tested By: M.F. Date: 1/18/2005

Reviewed By: Date: 1/20/05

ASTM C136GSP1, Rev. 4

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		21.1	36.8	42.1	Silt (>0.002mm)	Clay (<0.002mm)
0.0	20.0		% Sand	54.3	25.7	

Classification: BROWN C-F SAND, Some Silt and Fine Gravel **(Natural moisture upon reciept = 11.4%)**

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	15.00	91.4			
9.5	3/8"	20.00	88.6			
6.3	1/4"					
4.75	#4	35.00	80.0			
2.00	#10	55.00	68.6			
0.85	#20					
0.425	#40	90.00	48.6			
0.250	#60					
0.150	#100	120.00	31.4			
0.075	#200	130.00	25.7			

Total Dry Wt. 175
Split Wt.

Project:	LANGAN ENGINEERING	Project No.:	02227L	Date:	1/17/2005
City:	New Haven,CT	Specification:	Not Provided	Lab No:	C1546-05
Source:	003, ~~B-13~~, 1'-3' B3 Q1	Sampled from:	Provided by client, Job # 56419		

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

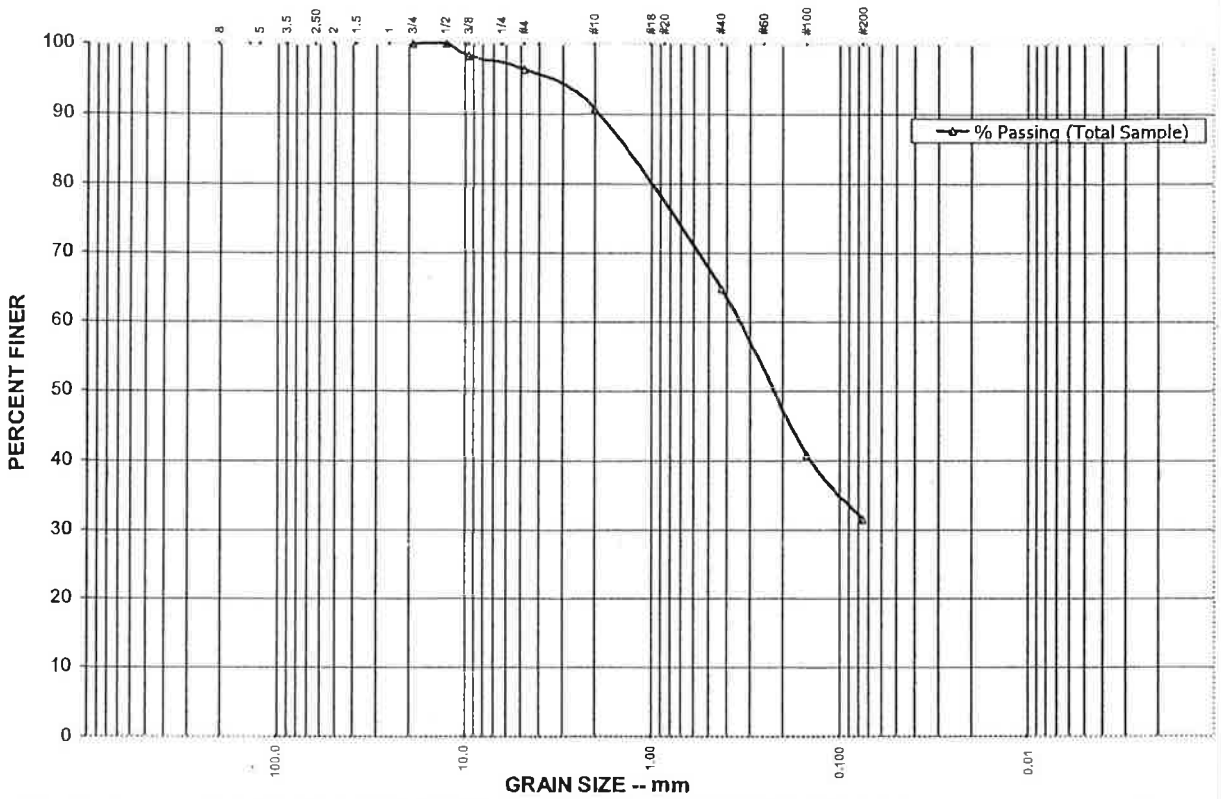
Remarks:

Tested By: M.F. Date: 1/18/2005

Reviewed By: MA Date: 1/21/05

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		8.6	40.0	51.4	Silt (>0.002mm)	Clay (<0.002mm)
0.0	3.7		% Sand	64.8	31.5	

Classification: BROWN C-F SAND, some Silt, trace Fine Gravel **(Natural moisture upon reciept = 12.9%)**

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	5.00	98.1			
6.3	1/4"					
4.75	#4	10.00	96.3			
2.00	#10	25.00	90.7			
0.85	#20					
0.425	#40	95.00	64.8			
0.250	#60					
0.150	#100	160.00	40.7			
0.075	#200	185.00	31.5			

Total Dry Wt. 270
Split Wt.

Project:	**LANGAN ENGINEERING**	Project No.:	**02227L**	Date:	**1/17/2005**
City:	New Haven,CT	Specification:	Not Provided	Lab No:	**C1548-05**
Source:	004, B-5, 6'-8'	Sampled from:	Provided by client, Job # 56419		

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (880) 829-1745
www.jgieastern.com

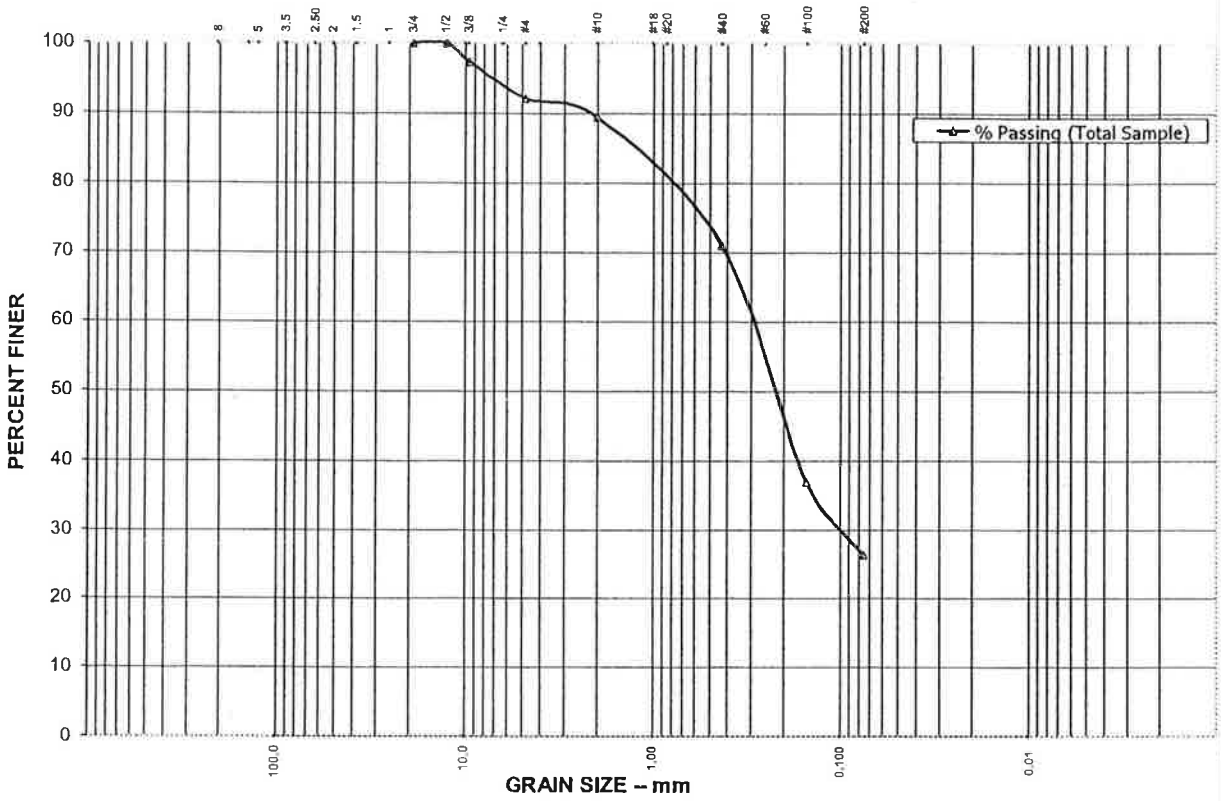
Remarks:

Tested By: M.F. Date: 1/18/2005

Reviewed By: Date: 1/20/05

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		4.0	28.0	68.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	7.9	% Sand		65.8	26.3	

Classification: BROWN C-F SAND, some Silt, trace Fine Gravel **(Natural moisture upon reciept = 13.2%)**

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	5.00	97.4			
6.3	1/4"					
4.75	#4	15.00	92.1			
2.00	#10	20.00	89.5			
0.85	#20					
0.425	#40	55.00	71.1			
0.250	#60					
0.150	#100	120.00	36.8			
0.075	#200	140.00	26.3			

Total Dry Wt. 190
Split Wt.

Project:	**LANGAN ENGINEERING**	Project No.:	**02227L**	Date:	**1/17/2005**
City:	New Haven,CT	Specification:	Not Provided	Lab No:	**C1550-05**
Source:	005, B-13, 0'-2'	Sampled from:	Provided by client, Job # 56419		

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

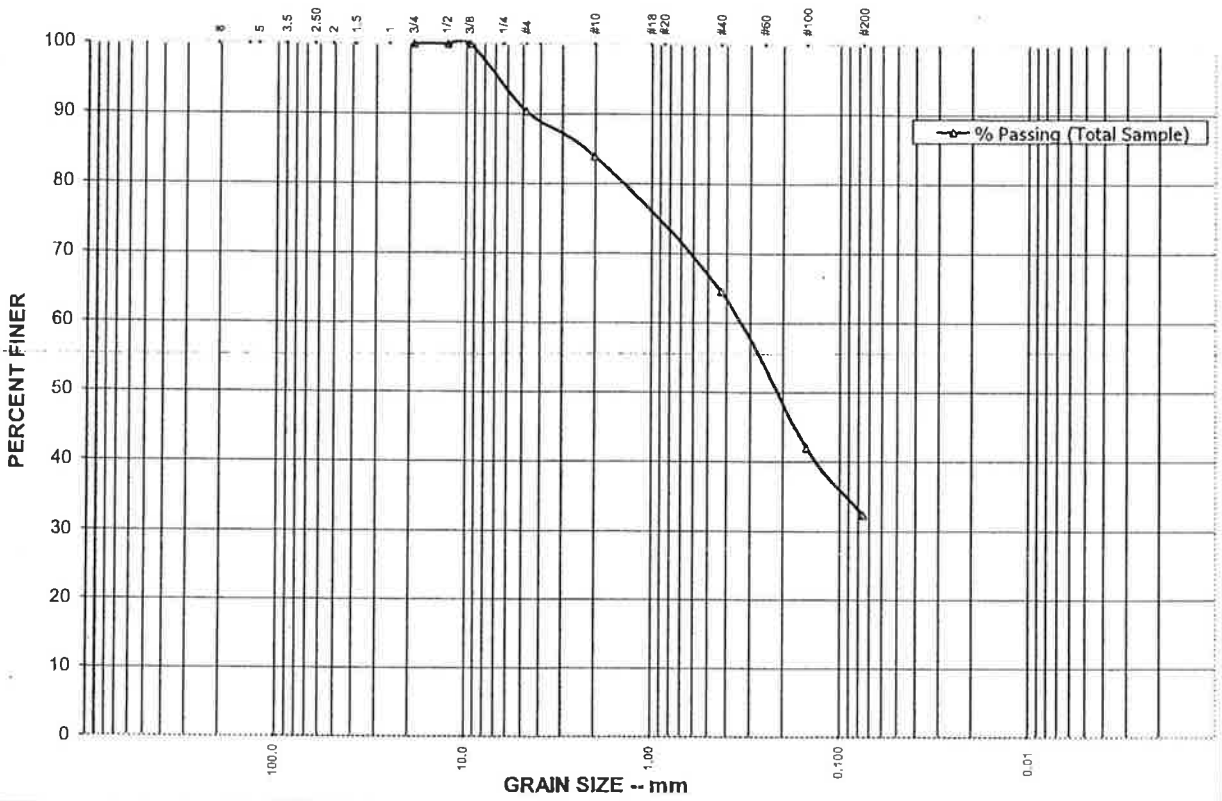
Remarks:

Tested By: M.F. Date: 1/18/2005

Reviewed By: MA Date: 1/21/05

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		11.1	33.3	55.6	Silt (>0.002mm)	Clay (<0.002mm)
0.0	9.7		% Sand	58.1	32.3	

Classification: BROWN C-F SAND, some Silt, trace Fine Gravel **(Natural moisture upon reciept = 16.1%)**

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	15.00	90.3			
2.00	#10	25.00	83.9			
0.85	#20					
0.425	#40	55.00	64.5			
0.250	#60					
0.150	#100	90.00	41.9			
0.075	#200	105.00	32.3			

Total Dry Wt. 155
Split Wt.

Project:	**LANGAN ENGINEERING**	Project No.:	**02227L**	Date:	**1/17/2005**
City:	New Haven,CT	Specification:	Not Provided	Lab No:	**C1549-05**
Source:	006, B-16, 0'-2'	Sampled from:	Provided by client, Job # 56419		

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks:

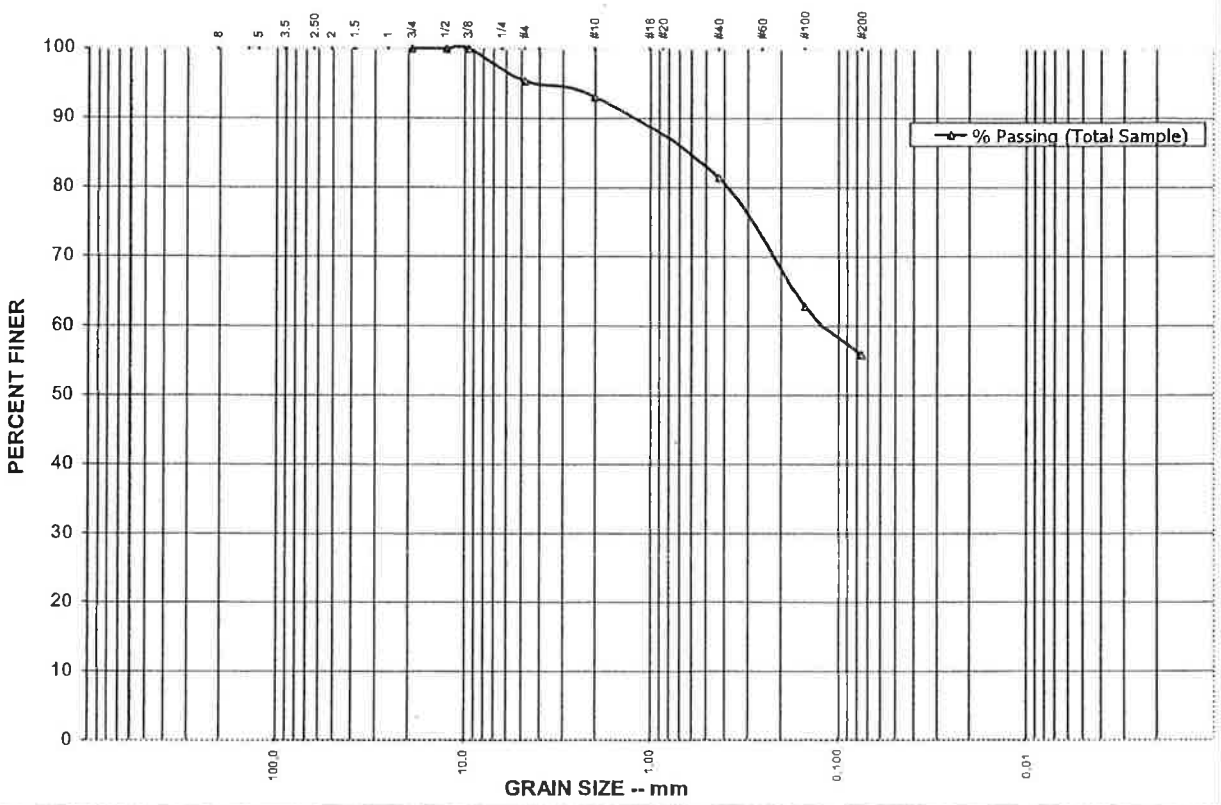
Tested By: M.F. Date: 1/18/2005

Reviewed By: Date: 1/21/05

ASTM C136GSP1, Rev. 4

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		5.9	29.4	64.7	Silt (>0.002mm)	Clay (<0.002mm)
0.0	4.7		% Sand	39.5	55.8	

Classification: BROWN SILT and C-F Sand, trace Fine Gravel **(Natural moisture upon reciept = 27.9%)**

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	10.00	95.3			
2.00	#10	15.00	93.0			
0.85	#20					
0.425	#40	40.00	81.4			
0.250	#60					
0.150	#100	80.00	62.8			
0.075	#200	95.00	55.8			

Total Dry Wt. 215
Split Wt.

Project:	**LANGAN ENGINEERING**	Project No.:	**02227L**	Date:	**1/17/2005**
City:	New Haven,CT	Specification:	Not Provided	Lab No:	**C1551-05**
Source:	007, B-9, 0'-2'	Sampled from:	Provided by client, Job # 56419		

JGI EASTERN, Inc.

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

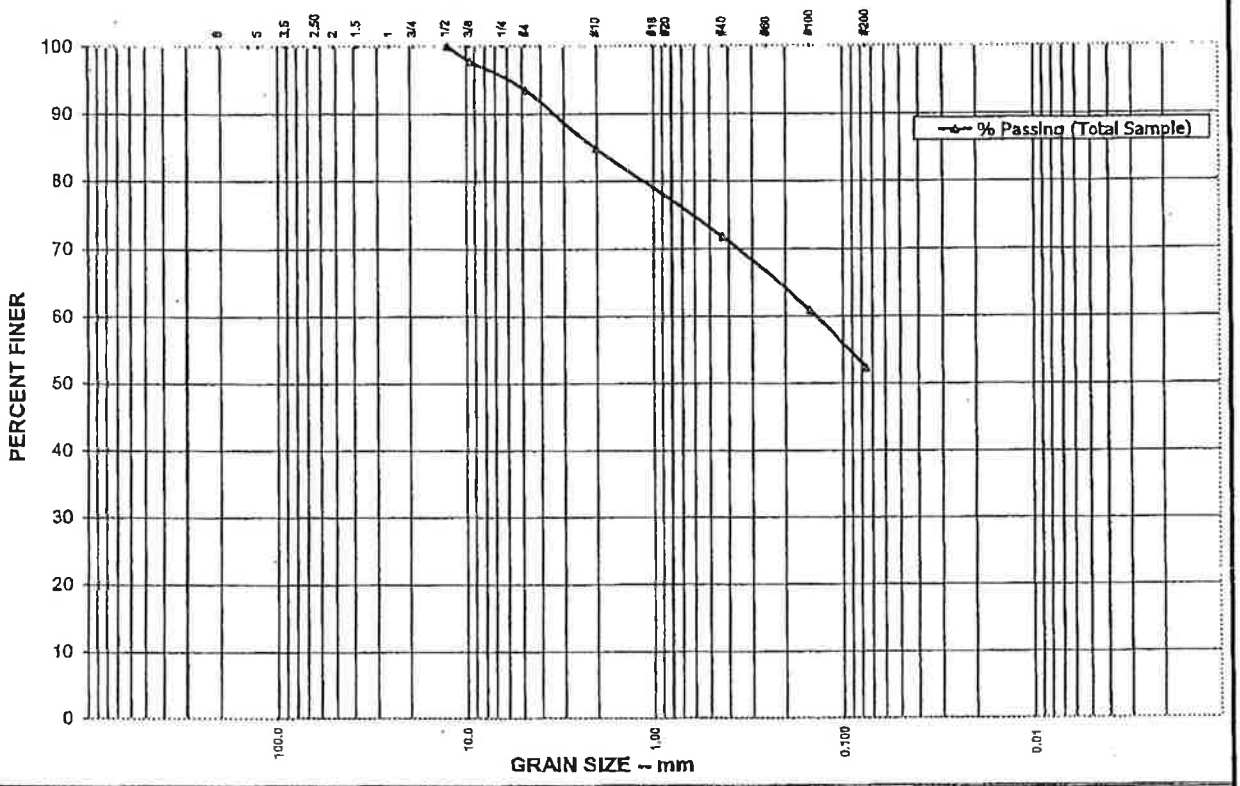
Remarks:

Tested By: M.F. Date: 1/18/2005
Reviewed By: MF Date: 1/19/05

ASTM C136GSP1, Rev. 4

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		21.1	31.6	47.4	Silt (>0.002mm)	Clay (<0.002mm)
0.0	6.5		% Sand	41.3	52.2	

Classification: TAN SILT and C-F SAND, trace Fine Gravel (Natural moisture upon reciept = 15.2%)

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"					
12.5	1/2"	0.00	100.0			
9.5	3/8"	5.00	97.8			
6.3	1/4"					
4.75	#4	15.00	93.5			
2.00	#10	35.00	84.8			
0.85	#20					
0.425	#40	65.00	71.7			
0.250	#60					
0.150	#100	90.00	60.9			
0.075	#200	110.00	52.2			
	Total Dry Wt.	230				
	Split Wt.					

Project:	LANGAN ENGINEERING	Project No.: 02227L	Date: 1/17/2005
City:	New Haven, CT	Specification: Not Provided	Lab No: C1563-05
Source:	~~009 B-9 5'-7'~~ 008 B2 4'-6'	Sampled from: Provided by client, Job # 56419	

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

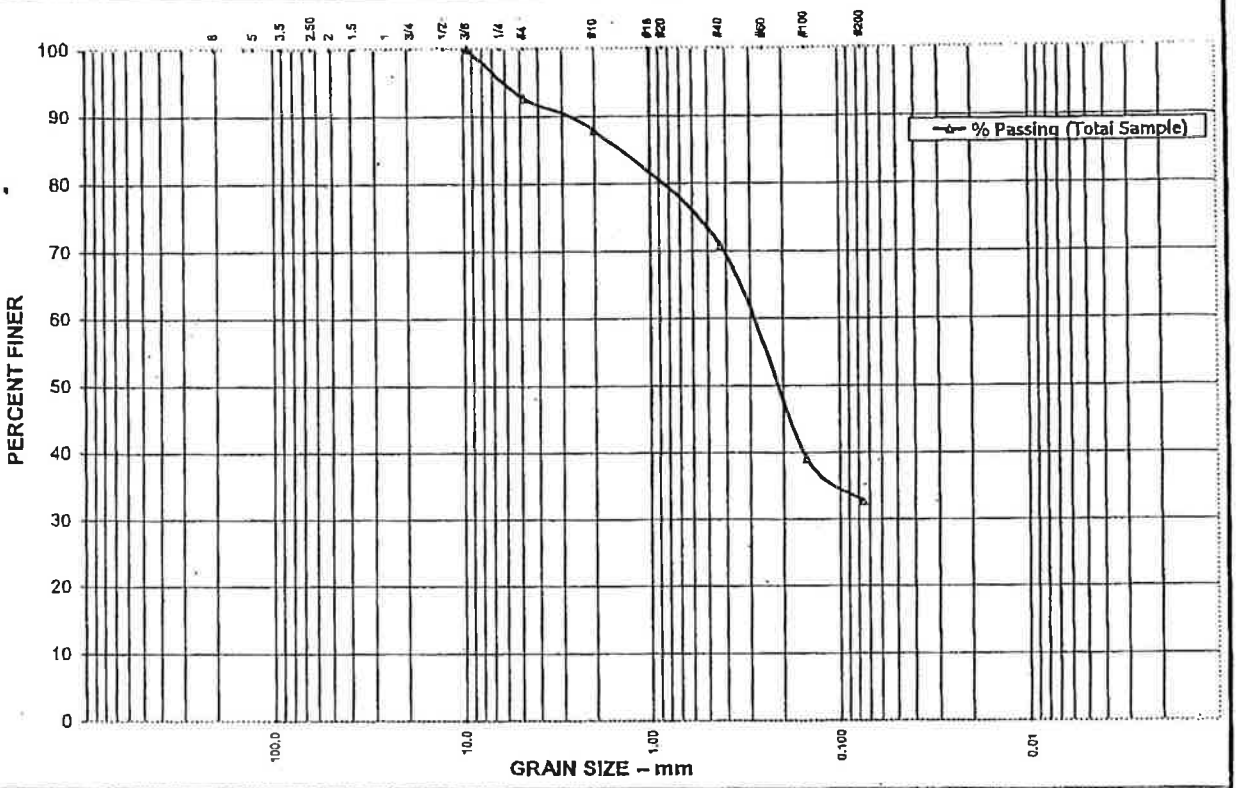
Remarks:

Tested By: M.F. Date: 1/21/2005

Reviewed By: KDS Date: 1/25/05

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		8.1	28.5	63.4	Silt (>0.002mm)	Clay (<0.002mm)
0.0	7.3		% Sand	60.0	32.7	

Classification: BROWN C-F SAND, some Silt, trace Fine Gravel **(Natural moisture upon reciept = 10.9%)**

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"					
12.5	1/2"					
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	15.00	92.7			
2.00	#10	25.00	87.8			
0.85	#20					
0.425	#40	60.00	70.7			
0.250	#60					
0.150	#100	125.00	39.0			
0.075	#200	138.00	32.7			

Total Dry Wt. 205
Split Wt.

Project:	LANGAN ENGINEERING	Project No.:	02227L	Date:	1/17/2005
City:	New Haven,CT	Specification:	Not Provided	Lab No:	C1561-05
Source:	009, B-9, 5'-7' ✓	Sampled from:	Provided by client, Job # 56419		

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks:

Tested By: M.F. Date: 1/21/2005

Reviewed By: KB Date: 1/25/05

APPENDIX D
GREENWICH PLANNING AND ZONING
LAND USE DEPARTMENT
CONDITIONS OF APPROVAL

KATIE DELUCA, AICP
DIRECTOR PLANNING AND ZONING/ZONING ENFORCEMENT COORDINATOR/TOWN PLANNER

PATRICK LAROW, AICP
Deputy Director Planning and Zoning/Assistant Town Planner
MARISA ANASTASIO, Senior Planner
BIANCA DYGERT, Planner II
JACALYN PRUITT, Planner II
SHANICE BECKER, Planner I
PETER MANGS, Applications Coordinator

PLANNING AND ZONING - LAND USE DEPARTMENT

MEMORANDUM

TO: Jodi Couture, Zoning Enforcement Officer

FROM: Patrick LaRow, Deputy Director/Assistant Town Planner
Bianca Dygert, Planner II

DATE: December 2, 2019

RE: OK for Zoning Permit Purposes
PLPZ 2019 00413
184 Hamilton Avenue
Hamilton Avenue School – Field improvements
Final Site Plan (FSP)
Zone: R-6

PROJECT: To reconstruct the existing playing fields, perimeter walks and related site improvements.

The attached site plans prepared by Milone & MacBroom last revised 10/1/2019, **are hereby approved for zoning permit purposes** and subject to the following:

1. Prior to any excavation or construction activity, proper Soil Erosion & Sediment Controls shall be installed to protect all neighboring properties and the Town of Greenwich Rights-of-Way.
2. The applicant shall comply with all conditions their Final Decision of the Tree Warden. Adequate tree protections for the trees to remain shall be installed prior to the start of site work and maintained through the construction phase.
3. Highway Division approval shall be granted prior to the start of any work within the Town's Right-of-Way.
4. Any changes to these plans shall be reviewed by Planning and Zoning;
5. All contractors parking shall be accommodated on site to the best extent possible. No blocking of Traffic on Hamilton Avenue or adjacent roads will be permitted without proper permissions.
6. Refer to the attached Engineer Division document for outstanding repairs to the drainage system; these repairs will be required prior to the issuance of a Certificate of Occupancy (C.O.). Applicant should discuss these repairs with Engineering Division staff

Town Hall • 101 Field Point Road • Greenwich, CT 06830 • [203] 622-7894 • FAX [203] 622-3795 • www.greenwichct.org

PRIOR TO THE ISSUANCE OF A ZONING PERMIT THE FOLLOWING CONDITIONS MUST BE MET:

1. ZEO to confirm compliance with all relevant Sections of the Building Zone Regulations.

PRIOR TO ANY C.O. THE FOLLOWING CONDITIONS MUST BE MET:

1. Planning & Zoning staff shall inspect the as-built conditions to verify compliance with this approval.
2. Per the Engineering Division, the following are observations intended for review during the CO process:
    a. No RRV is provided as the practices have underdrains thus are designed as filtering BMPs.
    b. Top and bottom of stone in infiltration chambers must match detail and be provided with elevations in the Improvement Location Survey (ILS).
    c. Filtering fabric at bottom of infiltration units is discouraged.
3. The Operations and Maintenance Plan Report shall include the following for the Certificate of Occupancy:
    a. The final completed Stormwater Management Practices Maintenance Declaration.
    b. The final completed Exhibit A, and Exhibit B (As Built).
    c. A review and approval of Item (a.) above must be completed before filing on the Town of Greenwich Land Records. The Maintenance Declaration shall then be filed on the Town of Greenwich Land Records with the Clerk, and a copy indicating the **Book Number** and **Page Number** shall be provided to Planning & Zoning Office.
4. Five (5) copies of an "Improvement Survey" map that depicts as-built conditions shall be submitted upon completion and prior to the issuance of a Certificate of Occupancy;
5. The Town of Greenwich- Standard Construction Notes for Site and Subdivision Plans are conditions that must be met.
6. All requests for a Temporary Certificate of Occupancy (T.C.O.) or a Certificate of Occupancy (C.O.) shall be submitted one month before the T.C.O. or C.O. is required.
7. The submittal for a Temporary or Final Certificate of Occupancy must include the following:
    d. Site Inspection Certification Sign-Off- Form SC-102 - Sealed and Signed by a Connecticut Licensed Professional Engineer.
    e. Drainage Certification Sign-Off - Form SC-103 - Sealed and Signed by a Connecticut Licensed Professional Engineer.
    f. Field Inspection Record (All required photos) - Form SC-106 - Sealed and Signed by a Connecticut Licensed Professional Engineer.
    g. Bioretention Soil Testing Certification Sign-Off (as applicable with the bioretention soil gradation test and the phosphorous test for the mixed soil) - Form SC-104 - Sealed and Signed by a Connecticut Licensed Professional Engineer.
    h. Operations & Maintenance Plan Report (Stormwater Management Practices Maintenance Declaration and Exhibit A)- Sealed and Signed by a Connecticut Licensed Professional Engineer.
    i. Improvement Location Survey Depicting "As-Built" Conditions - Sealed and Signed by a Connecticut Licensed Land Surveyor.
    j. A Letter discussing all the work that remains to be completed (Only for a Temporary Certificate of Occupancy Submittal).

Town of Greenwich
Planning & Zoning Department
Town Hall – 101 Field Point Road, Greenwich, CT 06830
Phone: (203)622-7894 – Fax: (203)622-3795

SITE PLAN ADMINISTRATIVE FORM

Property Address: 184 Hamilton Avenue

Tax Account Number(s): _____ Zone(s): R-6 Lot Area: 353,530 SF (8.1 acres)

Owners Name: Greenwich Public Schools - Contact: Dan Watson, Director of School Facilities Loriann O'Donnell loriann_o'donnell@greenwich.k12.ct.us

Phone: 203-625-7437 203-625-7471 Email: daniel_watson@greenwich.k12.ct.us

Signature: _____ Date: 10/3/19

Agent Name: Kevin Fuselier - Milone & MacBroom, Inc.

Phone: 203-271-1773 Email: kfuselier@mminc.com

Signature: _____ Date: 10-2-19

RECEIVED
OCT 3 2019
PLANNING & ZONING COMMISSION

Please select all relevant items below:

- ☐ Accessory Apartment, Affordable
- ☐ Accessory Apartment, Elderly
- ☐ Coastal Site Plan
- ☐ Outdoor Dining
- ☑ Soil Erosion and Sedimentation
- ☐ Special Event/Tent Review
- ☐ Utility of Telecommunications Facility
- ☐ Other: _____

Description of Activity or Work Proposed:

Reconstruct existing athletic fields and perimeter walks and associated improvements.

Previous Review/Approvals by P&Z (Date And Number) July 25, 2005 - FSP #2566, December 6, 2004 - FSP #2522

Total Building Square Footage (or total site work area):

Present Use: Baseball diamond/multi-use field Proposed Use: No change of use

Square Footage: 78,400 SF sitework area Square Footage: 78,400 SF sitework area

For staff use only:
Reviewed by:

Town Planner: _____ Senior Planner: _____

Asst. Town Planner: 12/2/19 Planner: 12/3/19

(2 signatures required- one must be Town Planner as per §6-13; Town Planner may waive full Commission review of small scale projects but require approval of ARC where appropriate.)

See Attached Conditions of Approval

To be completed by P&Z staff only:
Check # N/A Check Amount: $ No Fee - BOE project

Application # PLPZ20190041

PZ Admin App 2018

DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION
SITE DEVELOPMENT REVIEW

Engineering Project No.
PLPZ201800594

Department Project No.
PLPZ201800594

Submittal Received Date: 10/10/2019

Submittal Reviewed For:
Planning and Zoning

Traffic Review Requested: No

Review Type: Zoning Permit

RECEIVED
OCT 28 2019
PLANNING & ZONING
COMMISSION

PLAN SET INFORMATION

Plan Title: Hamilton Avenue Field Natural Grass Field Reconstruction

Project Address: 184 Hamilton Avenue

Engineering Firm: Milone and MacBroom

Original Plan Date: 10/1/2019

Latest Plan Revision Date: _____

DRAINAGE SUMMARY REPORT INFORMATION

Engineering Firm:
Milone and MacBroom

Original Report Date: 1/10/2019

Latest Report Revision Date: _____

Reviews provided by the Engineering Division are for compliance with the Town's "Roadway Design Manual and Standard Construction Details" and "Drainage Manual" as amended. Reviews are based upon the information and plans provided. Comments pertaining to the Town's manuals are not all encompassing. Other reviewing entities may provide additional comments regarding consistency with these manuals in accordance with their jurisdictions. Review of sanitary sewer and septic systems are not reviewed by the Engineering Division.

All New Submittals for Commission Meetings must be received by the Engineering Division four weeks before scheduled Commission Meeting.

All Revised Submittals for Commission Meetings must be received by the Engineering Division three weeks before scheduled Commission Meeting.

Reviewed and Approved By: _____ Date: 10/28/19

Juan Paredes, P.E. - Civil Engineer II

COMMENTS AND CONDITIONS OF APPROVAL: **Approved for Zoning/Building Permit**

☒ **Comments on Attached Documents Must be Completed**

1. Refer to the attached document for outstanding repairs to the drainage system; these repairs will be required prior to the issuance of a Certificate of Occupancy (C.O.). Applicant should discuss these repairs with Engineering Division staff.
2. The Drainage Summary Report is acceptable; the following are observations intended for review during the CO process:
    a. No RRV is provided as the practices have underdrains thus are designed as filtering BMPs.
    b. Top and bottom of stone in infiltration chambers must match detail and be provided with elevations in the Improvement Location Survey (ILS).
    c. Filtering fabric at bottom of infiltration units is discouraged.
3. The Operations and Maintenance Plan Report must include the following for the Certificate of Occupancy:
    a. The final completed Stormwater Management Practices Maintenance Declaration.
    b. The final completed Exhibit A, and B
    c. The Maintenance Declaration needs to be filed on the Town of Greenwich Land Records prior to a Certificate of Occupancy. A review of the documents above must be completed before filing on the Town of Greenwich Land Records.

4. The Town of Greenwich – Standard Construction Notes for Site and Subdivision Plans are conditions that must be met.
5. All requests for a Temporary Certificate of Occupancy (T.C.O.) or a Certificate of Occupancy (C.O.) shall be submitted one month before the T.C.O. or C.O. is required.
6. The submittal for a Temporary or Final Certificate of Occupancy must include the following:
    d. Site Inspection Certification Sign-Off – Form SC-102 – Sealed and Signed by a Connecticut Licensed Professional Engineer.
    e. Drainage Certification Sign-Off – Form SC-103 – Sealed and Signed by a Connecticut Licensed Professional Engineer.
    f. Field Inspection Record (All required photos) – Form SC-106 – Sealed and Signed by a Connecticut Licensed Professional Engineer.
    g. Bioretention Soil Testing Certification Sign-Off (as applicable with the bioretention soil gradation test and the phosphorous test for the mixed soil) – Form SC-104 – Sealed and Signed by a Connecticut Licensed Professional Engineer.
    h. Operations & Maintenance Plan Report (Stormwater Management Practices Maintenance Declaration and Exhibit A) – Sealed and Signed by a Connecticut Licensed Professional Engineer.
    i. Improvement Location Survey Depicting "As-Built" Conditions – Sealed and Signed by a Connecticut Licensed Land Surveyor.
    j. A Letter discussing all the work that remains to be completed (Only for a Temporary Certificate of Occupancy Submittal).

DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION
SITE DEVELOPMENT REVIEW

Engineering Project No. 05-5(P) | Department Project No. _____ | Submittal Received Date: 1/31/2018

Submittal Reviewed For: Planning and Zoning | Traffic Review Requested: ---------- | Review Type: Certificate of Occupancy

PLAN SET INFORMATION

Plan Title: Hamilton Avenue School | Project Address: 184 Hamilton Avenue

Engineering Firm: Langan Engineering | Original Plan Date: 6/19/2008 | Latest Plan Revision Date: _____

DRAINAGE SUMMARY REPORT INFORMATION

Engineering Firm: ---------- | Original Report Date: _____ | Latest Report Revision Date: _____

Existing Impervious Cover (SF)	Proposed Impervious Cover (SF)	Disconnected Impervious Cover (SF)	Directly Connected Impervious Cover (SF)
_____	_____	_____	_____

Reviews provided by the Engineering Division are for compliance with the Town's "Roadway Design Manual and Standard Construction Details" and "Drainage Manual" as amended. Reviews are based upon the information and plans provided. Comments pertaining to the Town's manuals are not all encompassing. Other reviewing entities may provide additional comments regarding consistency with these manuals in accordance with their jurisdictions. Review of sanitary sewer and septic systems are not reviewed by the Engineering Division.

All New Submittals for Commission Meetings must be received by the Engineering Division four weeks before scheduled Commission Meeting.

All Revised Submittals for Commission Meetings must be received by the Engineering Division three weeks before scheduled Commission Meeting.

Reviewed and Approved By: _____ Date: 2/13/18
Scott Marucci - Senior Civil Engineer

COMMENTS AND CONDITIONS OF APPROVAL: **Approved for Certificate of Occupancy**

TRAFFIC REVIEW COMMENTS: ----------

1. The Engineering Division has received the Improvement Location Survey depicting "As-Built" conditions dated June 19, 2008 and revised September 08, 2008 from Langan Engineering & Environmental Services – sealed and signed by Robert Migliore – Licensed Surveyor – License No. 70217 and the Letter of Certification dated December 09, 2008 from John Mallozzi, P.E. – sealed and signed by John Mallozzi – Professional Engineer – License No. 11007, stating that the drainage and the site work has been completed substantially in accordance with the approved plans. The Engineering Division has no objection to the issuance of the Certificate of Occupancy.
2. The CCTV inspection was completed, and the results are as follows:

Pipe Section	Issues	Required Repairs
DMH 602 to CB 531	Top of pipe was removed and it appears it is covered with a concrete slab @ 107.5 FT. Blockage at 134.2 FT.	The damaged section of pipe must be replaced. The blockage shall be removed.
CB 533 TO CB 532	Debris	Pipe should be jetted and cleaned.
DMH 602 to MH 1	Poor video but looks ok.	

MH 1 to MH 2	None	
CB 517 to CB 514	None	
DMH 4 to DMH 505	Debris	Pipe should be jetted and cleaned.
DMH 503 to DMH 512	None	
DMH 511 to DMH 513	None	
DMH 513 to DMH Old 3	Debris	Pipe should be jetted and cleaned.
DMH 514 to DMH 503	None	
DMH 520 to DMH 517	None	
DMH 601 to DMH 513	None	
DMH 506 to DMH 507	Debris	Pipe should be jetted and cleaned.
DMH 2 to DMH 512	Damaged (looks like post drilled through).	The damaged pipe section shall be replaced.
CH#1 see plan	None	
CH#2 see plan	None	
CH#3 see plan	None	
CH#1 to CB 530	Debris	Pipe should be jetted and cleaned.
CH#2 to CB 533	Debris	Pipe should be jetted and cleaned.
CH#3 – CB 533 to CB 532	Debris	Pipe should be jetted and cleaned.

KATIE DELUCA, AICP
DIRECTOR PLANNING AND ZONING/ZONING ENFORCEMENT COORDINATOR/TOWN PLANNER

PATRICK LAROW, AICP, Deputy Director Planning and Zoning/Assistant Town Planner
MARISA ANASTASIO, Senior Planner
BIANCA DYGERT, Planner II
JACALYN PRUITT, Planner II
SHANICE BECKER, Planner I
LAUREN LOCKWOOD, Applications Coordinator

PLANNING AND ZONING - LAND USE DEPARTMENT

ROUTING SLIP

TO:
- ☐ Zoning Enforcement
- ☒ Engineering Division
- ☐ Conservation Department
- ☐ Sewer Division
- ☐ Fire Department
- ☐ DPW-Eng-Traffic
- ☐ DEEP-OLISP
- ☐ Health Department
- ☐ Law Department
- ☐ Traffic Consultant
- ☐ Harbor / HDC / Abut. Towns
- ☒ File Copy

FROM: Bianca Dygert, Planner II

DATE: December 27, 2018

RE: Request for Your Comments
- ☒ For P&Z Administrative Review
- ☐ For P&Z Commission Review Estimated Meeting Date:

Please check the Tentative Agendas that are published and distributed 2 weeks before the meeting date to determine when the project will actually be reviewed by the Commission. Please provide comments no later than the Thursday before the published meeting date.

Project Name: **Greenwich Public Schools**

Project Address: **184 Hamilton Avenue**

Project Number: **PLPZ 201800594**

Application Type: Final Site Plan /Administrative /

Application Review Status: Prior to Building Permit Signoff

Materials for your Review: ☒ New ☐ Revisions ☐ Additional Information

Dept:	Item:	Prepared By:	Date:	Revised Date:
ENG	Engineering Plans	Milone & Macbroom	11/28/18	
ENG	Drainage Report	Milone & Macbroom	12/21/18	

RECEIVED
DEC 27 2018
DEPT. OF PUBLIC WORKS
ENGINEERING DIVISION

PREVAILING WAGE RATES

Project: Hamilton Avenue School Natural Grass Field Reconstruction

Minimum Rates and Classifications
for Heavy/Highway Construction

Connecticut Department of Labor
Wage and Workplace Standards Division

ID#: **H** 26794

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:
Project Town: Greenwich
FAP Number:
State Number:
Project: Hamilton Avenue School Natural Grass Field Reconstruction

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	34.72	32.15
2) Carpenters, Piledrivermen	33.53	25.66
2a) Diver Tenders	33.53	25.66

As of: Wednesday, December 18, 2019

3) Divers	41.99	25.66
03a) Millwrights	34.04	26.09
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	51.00	21.80
4a) Painters: Brush and Roller	34.62	21.80
4b) Painters: Spray Only	36.62	21.80
4c) Painters: Steel Only	35.62	21.80
4d) Painters: Blast and Spray	37.62	21.80

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

4e) Painters: Tanks, Tower and Swing	36.62	21.80
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)	40.00	36.15
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	35.77 + 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)	43.62	32.06
----LABORERS---- -		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	30.75	20.84
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	31.00	20.84

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

10) Group 3: Pipelayers	31.25	20.84
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	31.25	20.84
12) Group 5: Toxic waste removal (non-mechanical systems)	32.75	20.84
13) Group 6: Blasters	32.50	20.84
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	31.75	20.84
Group 8: Traffic control signalmen	18.00	20.84
Group 9: Hydraulic Drills	29.30	18.90

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

----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	32.98	20.84 + a
13b) Brakemen, Trackmen	32.01	20.84 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	32.01	20.84 + a
15) Form Erectors	32.34	20.84 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	32.01	20.84 + a
17) Laborers Topside, Cage Tenders, Bellman	31.90	20.84 + a
18) Miners	32.98	20.84 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	39.47	20.84 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	39.27	20.84 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	37.29	20.84 + a

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

21) Mucking Machine Operator	40.06	20.84 + a
----TRUCK DRIVERS----(*see note below)		
Two axle trucks	29.51	24.52 + a
Three axle trucks; two axle ready mix	29.62	24.52 + a
Three axle ready mix	29.67	24.52 + a
Four axle trucks, heavy duty trailer (up to 40 tons)	29.72	24.52 + a
Four axle ready-mix	29.77	24.52 + a

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

Heavy duty trailer (40 tons and over)	29.98	24.52 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	29.77	24.52 + a
----POWER EQUIPMENT OPERATORS----		
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)	40.97	24.80 + a
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)	40.64	24.80 + a
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)	39.88	24.80 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	39.48	24.80 + a

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

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)	38.87	24.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	38.87	24.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	38.55	24.80 + 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).	38.20	24.80 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	37.79	24.80 + 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).	37.34	24.80 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	35.24	24.80 + a

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	35.24	24.80 + a
Group 12: Wellpoint Operator.	35.18	24.80 + a
Group 13: Compressor Battery Operator.	34.58	24.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	33.41	24.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	32.99	24.80 + a
Group 16: Maintenance Engineer/Oiler	32.32	24.80 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	36.76	24.80 + a

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	34.26	24.80 + a

**NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----

20) Lineman, Cable Splicer, Technician	48.19	6.5% + 22.00
21) Heavy Equipment Operator	42.26	6.5% + 19.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
23) Driver Groundmen	26.50	6.5% + 9.00

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

23a) Truck Driver	40.96	6.5% + 17.76
----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
28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

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**

As of: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

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 $4.00 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 journeyperson 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: Wednesday, December 18, 2019

Project: Hamilton Avenue School Natural Grass Field Reconstruction

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: Wednesday, December 18, 2019

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 ULTMATELY ARISE CONCERNIG 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.

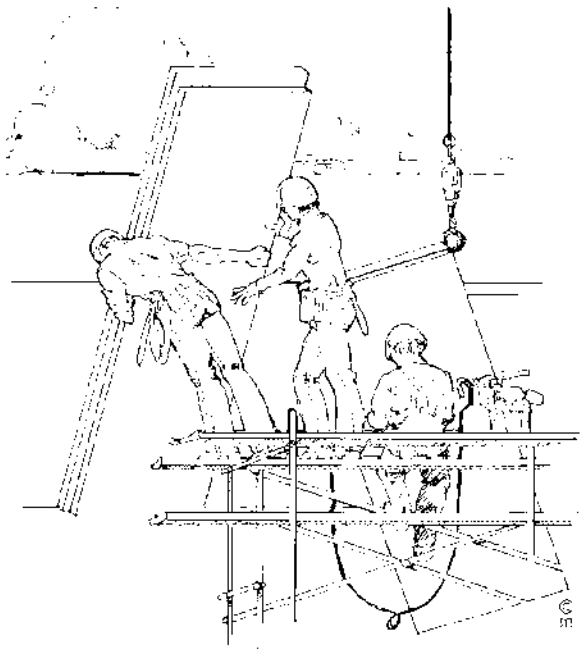
~NOTICE~

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): _____

Information Bulletin
Occupational Classifications

The Connecticut Department of Labor has the responsibility to properly determine *"job classification"* on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

- ***ASBESTOS WORKERS***

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- ***ASBESTOS INSULATOR***

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- ***BOILERMAKERS***

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- ***BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS***

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- ***CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS***

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **LABORER, CLEANING**

• The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

- **DELIVERY PERSONNEL**

• If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

• An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

- ***ELECTRICIANS***

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. ****License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.***

- ***ELEVATOR CONSTRUCTORS***

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. ****License required by Connecticut General Statutes: R-1,2,5,6.***

- ***FORK LIFT OPERATOR***

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

- ***GLAZIERS***

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

- ***IRONWORKERS***

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

- ***INSULATOR***

• Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

- ***LABORERS***

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal).

installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- ***PAINTERS***

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

- ***LEAD PAINT REMOVAL***

• Painter's Rate

1. Removal of lead paint from bridges.
2. Removal of lead paint as preparation of any surface to be repainted.
3. Where removal is on a Demolition project prior to reconstruction.

• Laborer's Rate

1. Removal of lead paint from any surface NOT to be repainted.
2. Where removal is on a *TOTAL* Demolition project only.

- ***PLUMBERS AND PIPEFITTERS***

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ****License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.***

- ***POWER EQUIPMENT OPERATORS***

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. ****License required, crane operators only, per Connecticut General Statutes.***

- ***ROOFERS***

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

- ***SHEETMETAL WORKERS***

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, facia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

- ***SPRINKLER FITTERS***

Installation, alteration, maintenance and repair of fire protection sprinkler systems. ****License required per Connecticut General Statutes: F-1,2,3,4.***

- ***TILE MARBLE AND TERRAZZO FINISHERS***

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

- **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ****License required, drivers only, per Connecticut General Statutes.***

For example:

• Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
• Hauling material off site is not covered provided they are not dumping it at a location outlined above.
• Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

➢ *Any questions regarding the proper classification should be directed to:*
Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.

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

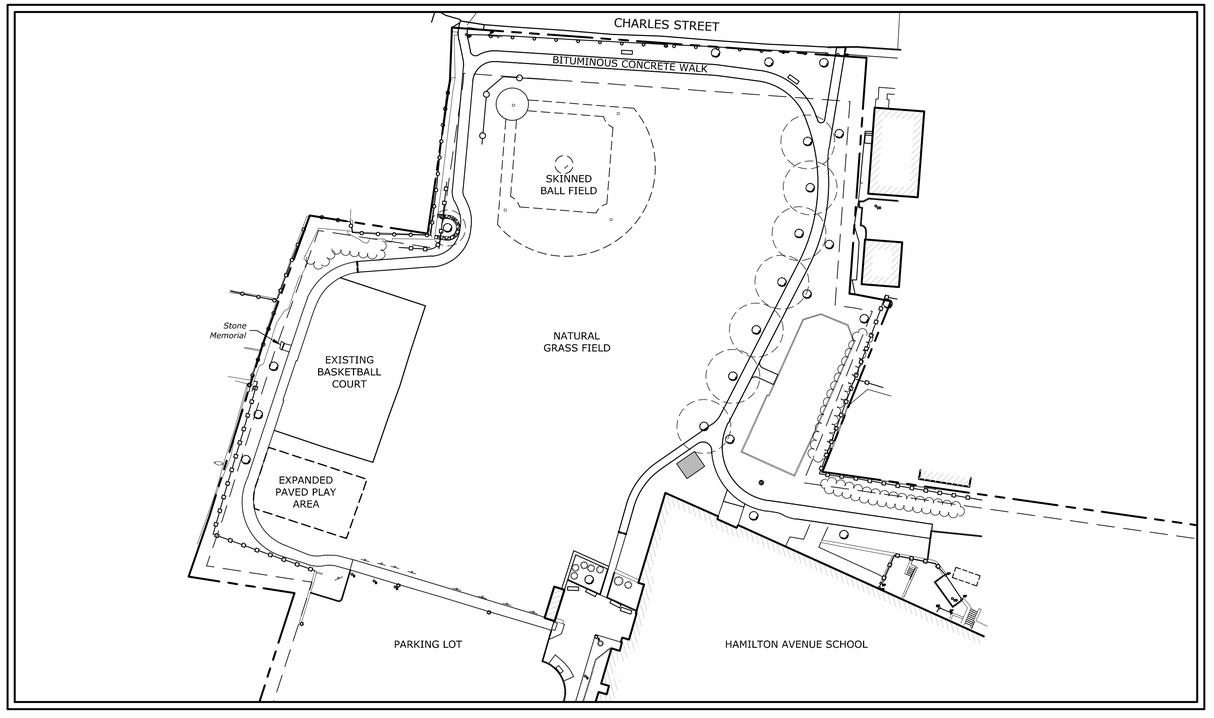
(Heavy and Highway Construction & Building Construction)

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.

HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION

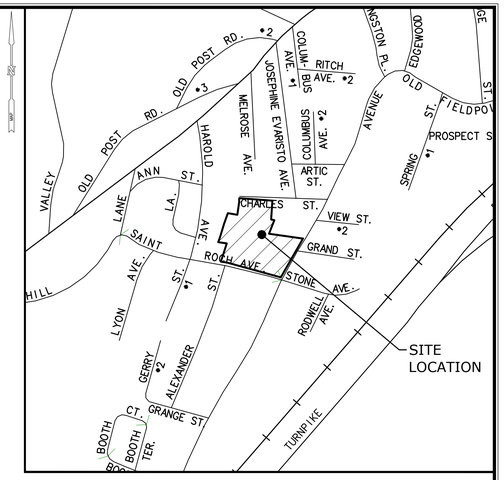
184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

BID DOCUMENTS
DECEMBER 20, 2019



PROJECT SITE VICINITY MAP:

0' 20' 40'
0 1/2" 1"
SCALE 1" = 40'



LOCATION MAP:

0' 250' 500'
0 1/2" 1"
SCALE 1" = 500'

PREPARED FOR:

GREENWICH PUBLIC SCHOOLS
290 GREENWICH AVENUE
GREENWICH, CT 06830

LIST OF DRAWINGS

NO.	NAME	TITLE
01	--	TITLE SHEET
02	NL	INDEX, NOTES AND LEGEND
03	EX	EXISTING CONDITIONS AND REMOVALS
04	LM	SITE PLAN - LAYOUT, LANDSCAPING AND MATERIALS
05	GU	SITE PLAN - GRADING AND UTILITIES
06	SE-1	SEDIMENT AND EROSION CONTROL PLAN
07	SE-2	SEDIMENT EROSION CONTROL SPECIFICATION AND DETAILS
08	SD-1	SITE DETAILS
09	SD-2	SITE DETAILS

PREPARED BY:

MILONE & MACBROOM
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
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811
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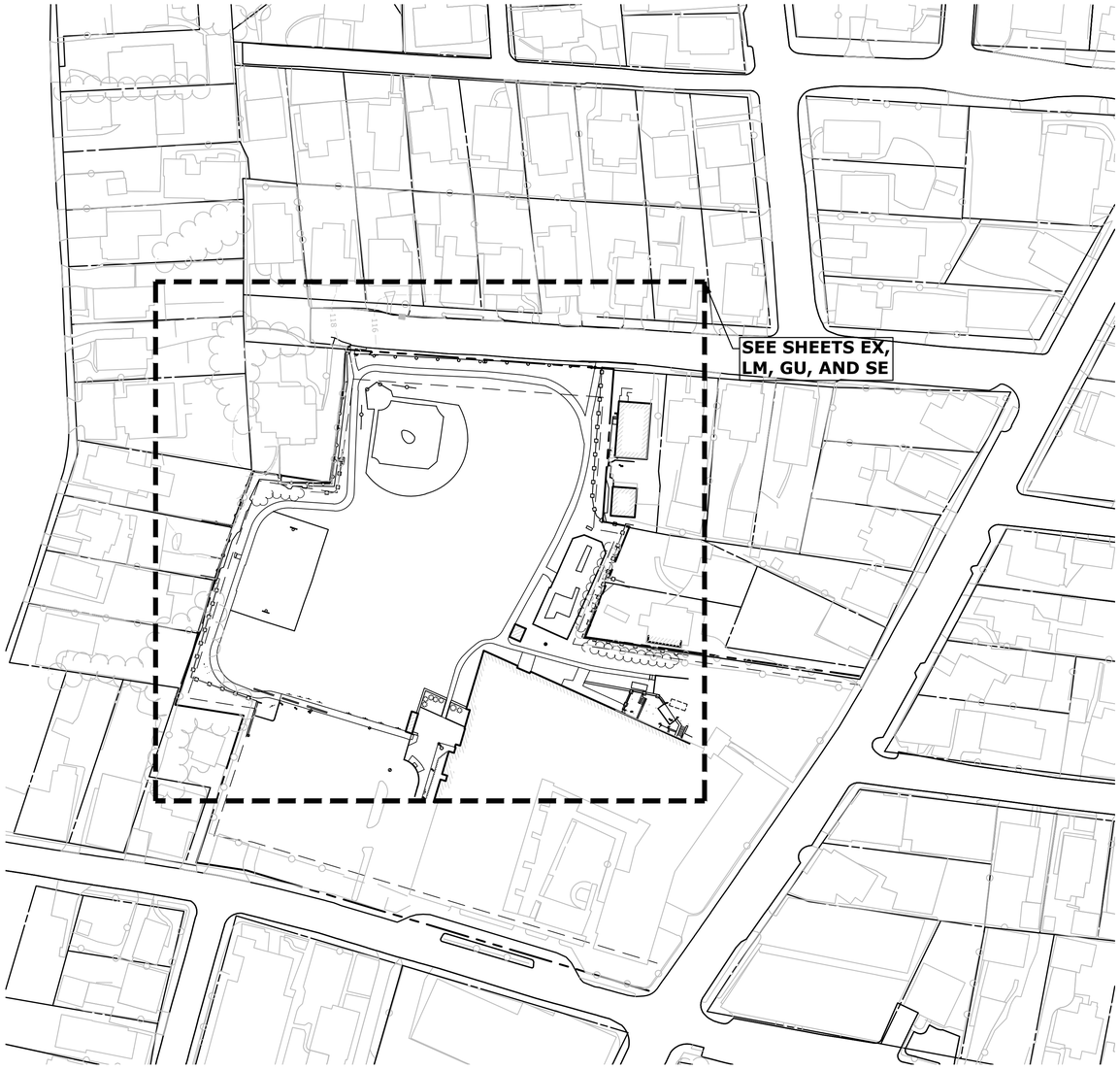
LEGEND

EXISTING		PROPOSED
	STREET LINE	
	PROPERTY LINE	
× wf-1-3	WETLAND FLAG	
70	MAJOR CONTOUR	70
68	MINOR CONTOUR	68
299.74 ×	SPOT GRADE	+70.5
	WETLANDS	
	TREE LINE	
	TREE/SHRUB	
	STONEWALL	
	SITE LIGHT	
	HYDRANT	
	WATER METER	
WV	WATER VALVE	WV
GV	GAS VALVE	GV
	CATCH BASIN	
	MANHOLE/YARD DRAIN/AREA DRN.	
	SANITARY SEWER W/MANHOLE	SAN
	STORM DRAIN W/CATCH BASIN	
W	WATER MAIN	W
DW	DOMESTIC WATER	DW
FP	FIRE PROTECTION WATER	FP
G	GAS MAIN	G
E	ELECTRIC LINE	E
ETC	ELECTRIC, TELEPHONE, CABLE	ETC
	UTILITY POLE	
	TRAFFIC SIGN	
	IRON PIPE	
	MONUMENT	
	EDGE OF PAVEMENT W/CURB	
	RETAINING WALL	
	SIDEWALK	
	CONTRACT LIMIT LINE	
	BOLLARD	(H.C. or Steel as spec.)
	TIMBER GUIDERAIL	
	CHAIN LINK FENCE	
TP-2	TEST PIT	
65	GEOTHERMAL WELL	



INDEX PLAN SCALE 1"=60'

GENERAL NOTES

1. TOPOGRAPHIC INFORMATION IS BASED UPON A MAP ENTITLED TOPOGRAPHIC SURVEY, SCALE 1"=20'. DRAWN BY MILONE AND MACBROOM,INC. DATED JUNE 13,2016. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE 'STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS A TOPOGRAPHIC SURVEY CONFORMING TO TOPOGRAPHIC ACCURACY CLASS T-2, AND IS INTENDED TO DEPICT THE EXISTING CONDITIONS OF THE SITE. NORTH ARROW IS BASED UPON THE CONNECTICUT COORDINATE SYSTEM (NAD 1983). ELEVATIONS, CONTOURS, AND BENCHMARKS ARE BASED UPON NAVD 1988. SUPPLEMENTED WITH GIS DATA FOR SURROUND SITE TOPOGRAPHY.
2. BOUNDARY AND STORM SYSTEM INFORMATION IS BASED UPON A MAP ENTITLED IMPROVEMENT LOCATION SURVEY- RECORD, SCALE 1"=30'. DRAWN BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES. DATED JUNE 19,2008 REVISED TO AUGUST 6,2008.
3. GEOTHERMAL WELL LOCATIONS AS PER GEOTHERMAL WELL FIELD PLAN M-001 DATED 2/4/08. POINTS WERE LOCATED USING DIMENSION SCHEDULE. ACTUAL FIELD LOCATIONS MAY VARY. CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION.
4. INFORMATION REGARDING THE LOCATION OF EXISTING UTILITIES HAS BEEN BASED UPON AVAILABLE INFORMATION AND MAY BE INCOMPLETE, AND WHERE SHOWN SHOULD BE CONSIDERED APPROXIMATE. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRIOR TO BEGINNING CONSTRUCTION. CALL "CALL BEFORE YOU DIG", 1-800-922-4455.
5. ALL UTILITY LOCATIONS THAT DO NOT MATCH THE VERTICAL OR HORIZONTAL CONTROL SHOWN ON THE PLANS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
6. MILONE & MACBROOM, INC. ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF MAPS AND DATA WHICH HAVE BEEN SUPPLIED BY OTHERS.
7. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
8. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL CONFORM TO THE "GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CONNECTICUT - 2002, AND IN ALL CASES BEST MANAGEMENT PRACTICES SHALL PREVAIL.
9. ALL DISTURBED AREAS SHALL RECEIVE A MINIMUM OF 6" TOPSOIL, AND BE SEEDED WITH GRASS OR SODDED, AS SHOWN ON THE PLANS, UNLESS THE AREA IS A MULCHED PLANT BED.
10. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS INDICATE FINISHED GRADE.
11. ALL CONSTRUCTION MATERIALS AND METHODS SHALL CONFORM TO TOWN REQUIREMENTS AND TO THE THE APPLICABLE SECTIONS OF THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION, FORM 816 AND ADDENDUMS
12. THE PLANS REQUIRE A CONTRACTOR'S WORKING KNOWLEDGE OF LOCAL, MUNICIPAL, WATER COMPANY, AND STATE CODES FOR UTILITY SYSTEMS. ANY CONFLICTS BETWEEN MATERIALS AND LOCATIONS SHOWN, AND LOCAL REQUIREMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE EXECUTION OF WORK. THE ENGINEER WILL NOT BE HELD LIABLE FOR COSTS INCURRED TO IMPLEMENT OR CORRECT WORK WHICH DOES NOT CONFORM TO LOCAL CODE.
13. ALL FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS USED DURING CONSTRUCTION SHOULD BE STORED IN A SECONDARY CONTAINER AND REMOVED TO A LOCKED INDOOR AREA WITH AN IMPERVIOUS FLOOR DURING NON-WORK HOURS.
14. COMPLIANCE WITH THE PERMIT CONDITIONS IS THE RESPONSIBILITY OF BOTH THE CONTRACTOR AND THE PERMITTEE.
15. THE CONTRACTOR MUST MAINTAIN (REPAIR/REPLACE WHEN NECESSARY) THE SILTATION CONTROL MEASURES UNTIL ALL DEVELOPMENT ACTIVITY IS COMPLETED AND ALL DISTURBED AREAS ARE PERMANENTLY STABILIZED.
16. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING UTILITY INFRASTRUCTURE AT NO ADDITIONAL COST TO THE OWNER.

TOWN OF GREENWICH STANDARD CONSTRUCTION NOTES

1. A HIGHWAY PERMIT IS REQUIRED FOR ALL WORK WITHIN THE TOWN OF GREENWICH - RIGHT OF WAY.
2. ALL WORK WITHIN THE TOWN OF GREENWICH - RIGHT OF WAY SHALL BE CONSTRUCTED TO TOWN OF GREENWICH STANDARDS.
3. CATCH BASINS FOR PRIVATE DRIVEWAYS SHALL HAVE A MINIMUM GRATE OF TWO FEET BY TWO FEET. IF THE DRIVEWAY IS CURBED THE CATCH BASIN SHALL HAVE A MINIMUM CURB INLET OF SIX INCHES. EACH DRIVEWAY CATCH BASIN SHALL ALSO HAVE A MINIMUM TWO-FOOT SUMP AND BELL TRAP.
4. ALL DRAINAGE CONNECTIONS TO THE TOWN DRAINAGE SYSTEM SHALL BE GRAVITY LINES. IF A DISCHARGE FROM A SUMP PUMP IS CONNECTED TO THE TOWN DRAINAGE SYSTEM IT MUST DISCHARGE TO A DRAINAGE STRUCTURE ON PRIVATE PROPERTY AND THEN BE CONNECTED TO THE TOWN DRAINAGE SYSTEM. A DRAIN CONNECTION PERMIT FROM THE HIGHWAY DIVISION IS REQUIRED FOR ALL CONNECTIONS TO THE TOWN DRAINAGE SYSTEM.
5. IN ROADWAY CUTS, SUBDRAINS SHALL BE REQUIRED IF SEEPAGE OCCURS DURING CONSTRUCTION OR WITHIN ONE YEAR AFTER ROAD CONSTRUCTION IS COMPLETED AND ACCEPTED, EVEN THOUGH PLANS MAY HAVE BEEN APPROVED WITHOUT SUBDRAINS AND/OR ROADWAY CONSTRUCTION HAS BEEN COMPLETED.
6. ALL RETAINING WALLS GREATER THAN THREE FEET ARE REQUIRED TO BE DESIGNED, AND INSPECTED DURING CONSTRUCTION BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CONNECTICUT.
7. ALL DETENTION/RETENTION SYSTEMS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL SYSTEMS SHALL USE A MANIFOLD SYSTEM TO DISTRIBUTE RUNOFF EVENLY INTO EACH ROW OF INFILTRATORS. DETENTION SYSTEMS WILL HAVE A MANIFOLD SYSTEM THAT CREATES THE LONGEST TRAVEL TIME TO THE CONTROL STRUCTURE. ALL DETENTION/RETENTION SYSTEMS MUST USE A STRUCTURE SUCH AS A MANHOLE FOR THE CONTROL STRUCTURE SO ALL FLOW CONTROL DEVICES CAN BE ACCESSED FOR MAINTENANCE.
8. ALL INFILTRATION SYSTEMS MUST MEET THE STORMWATER INFILTRATION/RECHARGE DESIGN REQUIREMENTS IN APPENDIX B OF THE TOWN OF GREENWICH DRAINAGE MANUAL. THERE MUST BE AT LEAST A 2 FOOT SEPARATION DISTANCE FROM THE BOTTOM OF STONE BELOW THE INFILTRATION STRUCTURE TO THE SEASONAL HIGH GROUNDWATER OR BEDROCK/LEDGE (THIS SEPARATION REQUIREMENT MAY BE WAIVED OR REDUCED BY THE APPROVING AUTHORITY ON A CASE-BY-CASE BASIS). A 3-FOOT SEPARATION DISTANCE IS REQUIRED FROM THE BOTTOM OF STONE BELO W THE INFILTRATION STRUCTURE TO SEASONAL HIGH GROUNDWATER FOR LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS (HIGH LOAD AREAS). PRIOR TO THE INSTALLATION OF THE INFILTRATORS THE ENGINEER SHALL VERIFY THE INFILTRATION STRUCTURE IS BEING INSTALLED IN THE APPROVED LOCATION AND IF THE LOCATION HAS BEEN CHANGED ADDITIONAL SOIL TESTING SHALL BE PERFORMED AND THE ENGINEER SHALL APPROVE THE REVISED LOCATION. A REVIEW BY THE APPROVING AUTHORITY WILL BE REQUIRED.
9. EACH BMP TO BE INSTALLED SHALL HAVE THE SOILS BENEATH THE BMP SCARIFIED OR TILLED TO IMPROVE INFILTRATION.
10. THE CONTRACTOR MUST CONSTRUCT THE BIORETENTION AREA FOLLOWING THE SPECIFICATIONS IN APPENDIX G OF THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED.
11. ALL AREAS THAT ARE USED BY CONSTRUCTION EQUIPMENT AND USED FOR CONTRACTOR PARKING MUST HAVE THE SOIL TILLED 12 TO 16 INCHES AND AMENDED WITH SMALL AMOUNTS OF ORGANIC MATERIAL IF NEEDED. THE AREA TO BE RESTORED SHALL BE DETERMINED BY THE SITE ENGINEER.
12. COMPOST-AMENDED SOILS MUST FOLLOW THE REQUIREMENTS AS STATED IN THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED.
13. TO OBTAIN A CERTIFICATE OF OCCUPANCY THE SUBMITTAL MUST INCLUDE THE FOLLOWING:

    -ITEMS ON CHECKLIST FOR CERTIFICATE OF OCCUPANCY - FORM CL-105

    -IMPROVEMENT LOCATION SURVEY (ITEMS OF CHECKLIST FOR IMPROVEMENT LOCATION SURVEY DEPICTING "AS-BUILT" CONDITIONS - FORM CL-106)

N
W E
S
0' 30' 60'
0 1/2" 1"

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DESCRIPTION	DATE	BY

INDEX, NOTES AND LEGEND

HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION

184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

KCF	JJM	KCF
DESIGNED	DRAWN	CHECKED

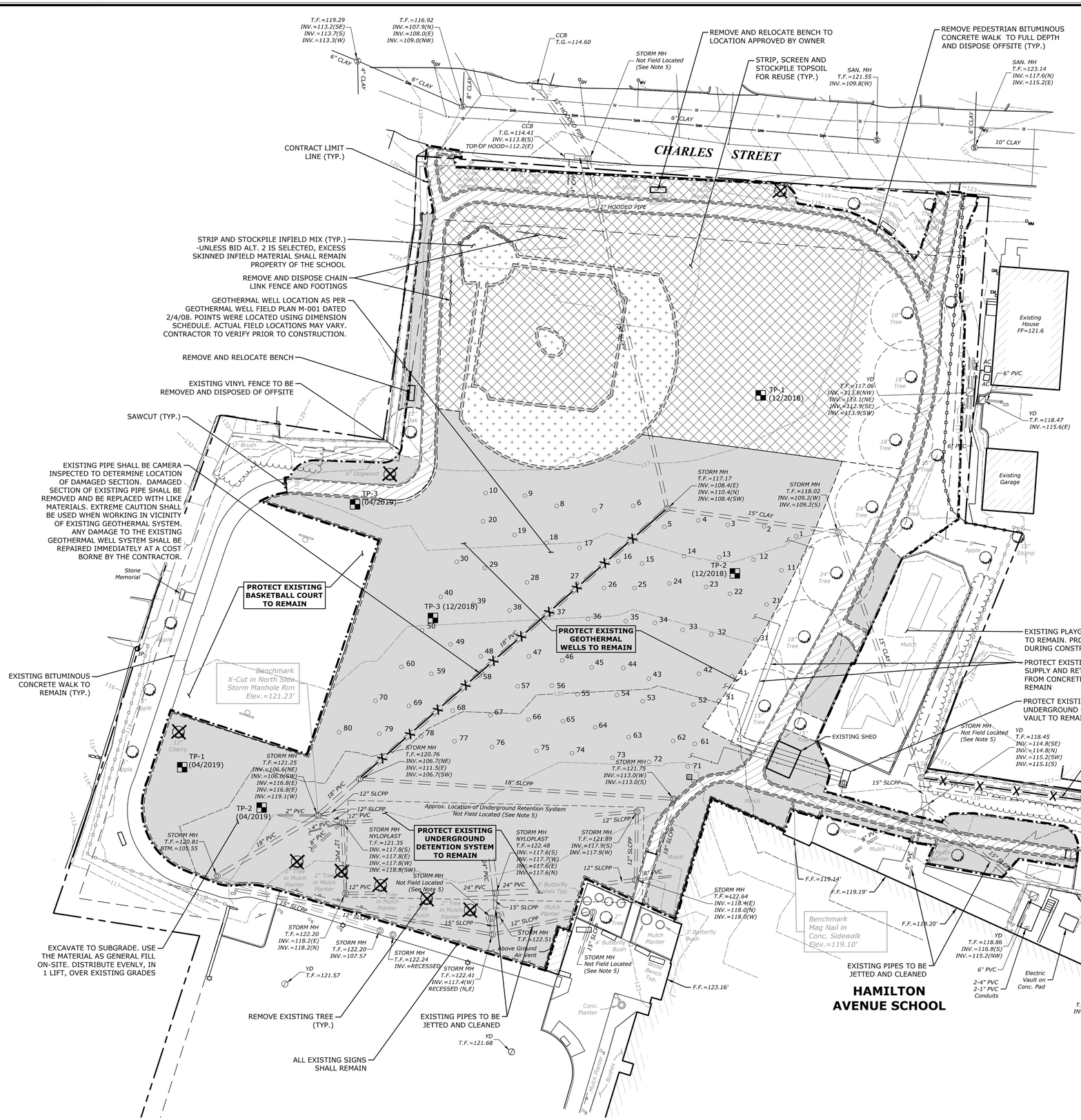
AS NOTED
SCALE

DECEMBER 20, 2019
DATE

5062-08
PROJECT NO.

SHEET NO.

NL
SHEET NAME



REMOVALS NOTES:

1. INFORMATION REGARDING THE LOCATION OF EXISTING UTILITIES HAS BEEN BASED UPON AVAILABLE INFORMATION AND MAY BE INCOMPLETE, AND WHERE SHOWN SHOULD BE CONSIDERED APPROXIMATE. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRIOR TO BEGINNING CONSTRUCTION. CALL "CALL BEFORE YOU DIG", 1-800-922-4455. ALL UTILITY LOCATIONS THAT DO NOT MATCH THE VERTICAL OR HORIZONTAL CONTROL SHOWN ON THE PLANS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
2. INFORMATION SHOWN ON THIS DRAWING IS TO BE USED FOR REFERENCE ONLY. THE LOCATION, SIZE AND ELEVATIONS OF UTILITIES AND STRUCTURES AND THE NATURE OF THEIR CONTENTS SHALL BE CONFIRMED IN THE FIELD PRIOR TO DEMOLITION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO DEMOLITION.
3. THE INTENT OF THIS DRAWING IS TO IDENTIFY SPECIFIC DEMOLITIONS. HOWEVER, THE GRAPHIC LEGEND MAY NOT BE A COMPREHENSIVE LIST OF ALL SITE REMOVALS.
4. ABANDONED UTILITIES ARE TO BE REMOVED IN AREAS WHERE THEY CONFLICT WITH PROPOSED UTILITY DEPTHS AND LOCATIONS.
5. CONTRACTOR TO COORDINATE ALL PROPOSED UTILITY WORK WITH APPROPRIATE UTILITY COMPANIES. THIS WORK SHALL BE DONE AT THE CONTRACTORS EXPENSE UNLESS OTHERWISE PROVIDED FOR IN THE SPECIFICATIONS. THE CONTRACTOR SHALL REMOVE OR ABANDON THE EXISTING UTILITY SERVICES AS DIRECTED AND TO THE SATISFACTION OF EACH INDIVIDUAL UTILITY COMPANY.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE TIMING OF THE REMOVAL OF EXISTING UTILITIES, PAVEMENTS, AND OTHER INFRASTRUCTURE BASED ON THE PHASED CONSTRUCTION. SEE SITE UTILIZATION PLANS PROVIDED BY OTHERS. THIS PROJECT IS BEING CONSTRUCTED IN PHASES.
7. COMPLETELY REMOVE ALL EXISTING PIPES AND STRUCTURES WITHIN THE NEW BUILDING ADDITIONS AS CALLED FOR ON THE PLANS. EXISTING PIPES OUTSIDE OF THE NEW BUILDING LIMITS SHALL BE COMPLETELY REMOVED OR PLUGGED AND ABANDONED IN PLACE AS NOTED ON THE PLANS OR AS NECESSARY TO COMPLETE THE PROPOSED WORK. EXISTING PIPES TO BE ABANDONED THAT ARE FOUND TO BE IN CONFLICT WITH PROPOSED SITE IMPROVEMENTS SHALL BE COMPLETELY REMOVED.
8. ALL UNDERGROUND UTILITIES NOT SHOWN TO BE REMOVED SHALL HAVE SERVICE MAINTAINED AND SHALL BE PROTECTED DURING CONSTRUCTION.
9. SEE ARCHITECTURAL PLANS FOR DEMOLITION OF EXISTING STRUCTURES
10. WORK SHALL NOT COMMENCE UNTIL APPROVED IN WRITING BY THE OWNER
11. CONTRACTOR IS RESPONSIBLE TO OBTAIN PERMITS REQUIRED AND COMPLY WITH ALL REGULATIONS IN THE DEMOLITION AND REMOVAL OF THE DESIGNATED STRUCTURES.
12. INSTALL ALL SEDIMENT AND EROSION CONTROLS PRIOR TO BEGINNING DEMOLITION WORK.
13. EXTENT OF PAVEMENT TO BE REMOVED IS SHOWN ON PLAN. CONTRACTOR SHALL PROTECT AREAS OF PAVEMENT IDENTIFIED TO REMAIN.
14. UNDERGROUND SEPTIC TANK TO BE REMOVED IN ACCORDANCE WITH STATE OF CONNECTICUT RULES AND REGULATIONS REGARDING SUCH WORK.
15. ANY MATERIALS DEEMED UNSUITABLE BY THE ENGINEER SHALL BE DISPOSED OF OFF-SITE IN CONFORMANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
16. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS AND FEES ASSOCIATED WITH THE HANDLING AND DISPOSAL OF ALL MATERIALS.
17. PRIOR TO REMOVAL OF WOODED AREAS THE LIMITS OF CLEARING SHOULD BE FLAGGED. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT FOR APPROVAL IN ORDER TO PROTECT SIGNIFICANT VEGETATION.
18. ALL VEGETATION WITHIN THE PROJECT LIMITS TO BE CLEARED AND GRUBBED UNLESS NOTED OTHERWISE.
19. ALL TREES TO REMAIN SHALL BE PROTECTED AS INDICATED.
20. ALL TREES/VEGETATION IN CONFLICT WITH PROPOSED WORK SHALL BE REMOVED WHETHER NOTED ON THE PLANS OR NOT
21. ALL EXISTING LIGHT POLE'S ARE TO BE REMOVED AND DISPOSED OF (POLE, LUMINARIES AND CONCRETE BASE)
22. BOULDERS OVER 2' X 2' X 2' ENCOUNTERED DURING EXCAVATION AND EARTHWORK OPERATIONS, WHETHER ENCOUNTERED ABOVE OR BELOW GRADE SHALL BE REMOVED AND STOCKPILED FOR REUSE ON SITE. COORDINATE STOCKPILE LOCATION WITH OWNER AND PHASING PLANS.
23. ALL EXISTING GEOTHERMAL WELLS ARE TO REMAIN AND PROTECTED DURING CONSTRUCTION.

REMOVALS LEGEND

- STRIP, SCREEN, AND STOCKPILE 6" TOPSOIL FOR REUSE
- STRIP AND STOCKPILE INFIELD MIX
- EXCAVATE TO SUBGRADE. USE THE MATERIAL AS GENERAL FILL ON-SITE. DISTRIBUTE EVENLY, IN 1 LIFT, OVER EXISTING GRADE.
- REMOVE PEDESTRIAN BITUMINOUS CONCRETE WALK TO FULL DEPTH AND DISPOSE OFF SITE
- REMOVE AND DISPOSE OF CONCRETE WALK
- REMOVE TREE
- 65 GEOTHERMAL WELLS
- SAWCUT LIMITS
- CONTRACT LIMIT LINE
- TP-3 TEST PIT
- REPLACE DAMAGED SECTION OF PIPE

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DESCRIPTION	DATE	BY

EXISTING CONDITIONS AND REMOVALS

HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION

184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

KCF	JJM	KCF
DESIGNED	DRAWN	CHECKED

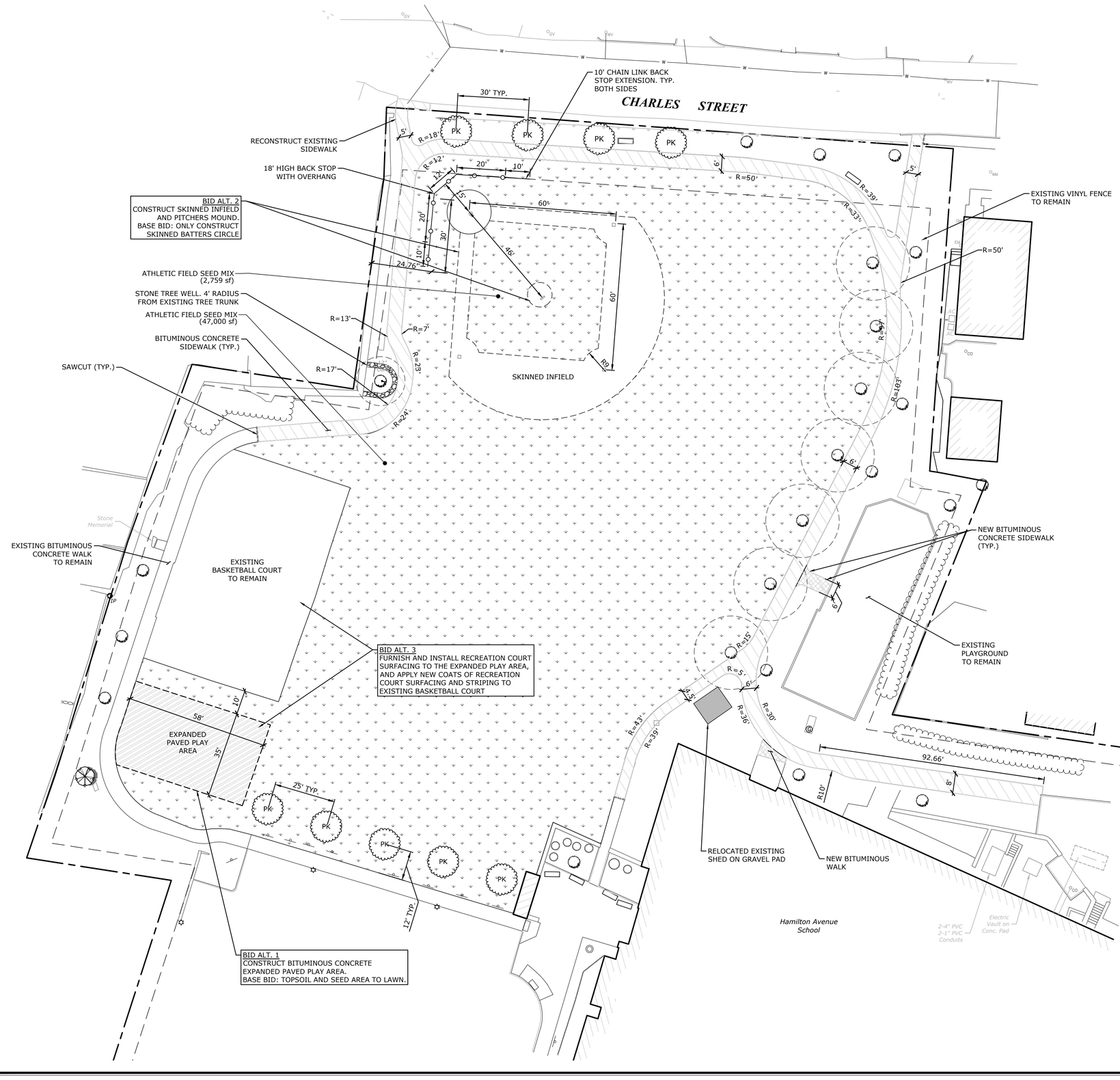
SCALE: 1"=20'

DATE: DECEMBER 20, 2019

PROJECT NO.: 5062-08

SHEET NO.:

SHEET NAME: EX



PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
PK	9	Prunus serrulata `Kwanzan`	Flowering Cherry	2.5"-3" CAL.

SEED MIX PLANT SCHEDULE

ATHLETIC FIELD SEED MIX	49,560 sf
Seed Rate: 8 lbs./1,000 SF	
~	
Lolium perenne `Cutter II` / Cutter II Perennial Ryegrass	9,912 sf
Poa x `Quantum Leap` / Quantum Leap Kentucky Bluegrass	19,824 sf
Poa x `Touchdown` / Touchdown Kentucky Bluegrass	9,912 sf

MATERIALS NOTES

1. CONCRETE SIDEWALKS, ENTRY AREAS, AND TERRACES SHALL INCORPORATE EXPANSION JOINTS, SCORE JOINTS, AND CONSTRUCTION JOINTS PER THE SPECIFICATIONS AND DETAILS, TYPICALLY NO MORE THAN 144 SQUARE FEET SHALL BE A CONTIGUOUS SLAB. SEE ARCHITECTURAL AND STRUCTURAL PLANS FOR JOINTING PERTAINING TO THESE DISCIPLINES.
2. ALL CHAIN LINK FENCING TO BE BLACK PVC VINYL COATED.
3. WAYFINDING SIGNS WILL BE DEPICTED IN A FUTURE PHASE OF DESIGN.

LAYOUT NOTES

1. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
2. SEE EXISTING CONDITIONS PLAN FOR VERTICAL AND HORIZONTAL BENCH MARK INFORMATION.

MATERIALS LEGEND

- BITUMINOUS CONCRETE SIDEWALK
- BITUMINOUS CONCRETE PAVED PLAY
- 65 — GEOTHERMAL WELLS

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DESCRIPTION	DATE	BY

SITE PLAN- LAYOUT, LANDSCAPING AND MATERIALS

HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION

184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

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DATE: DECEMBER 20, 2019

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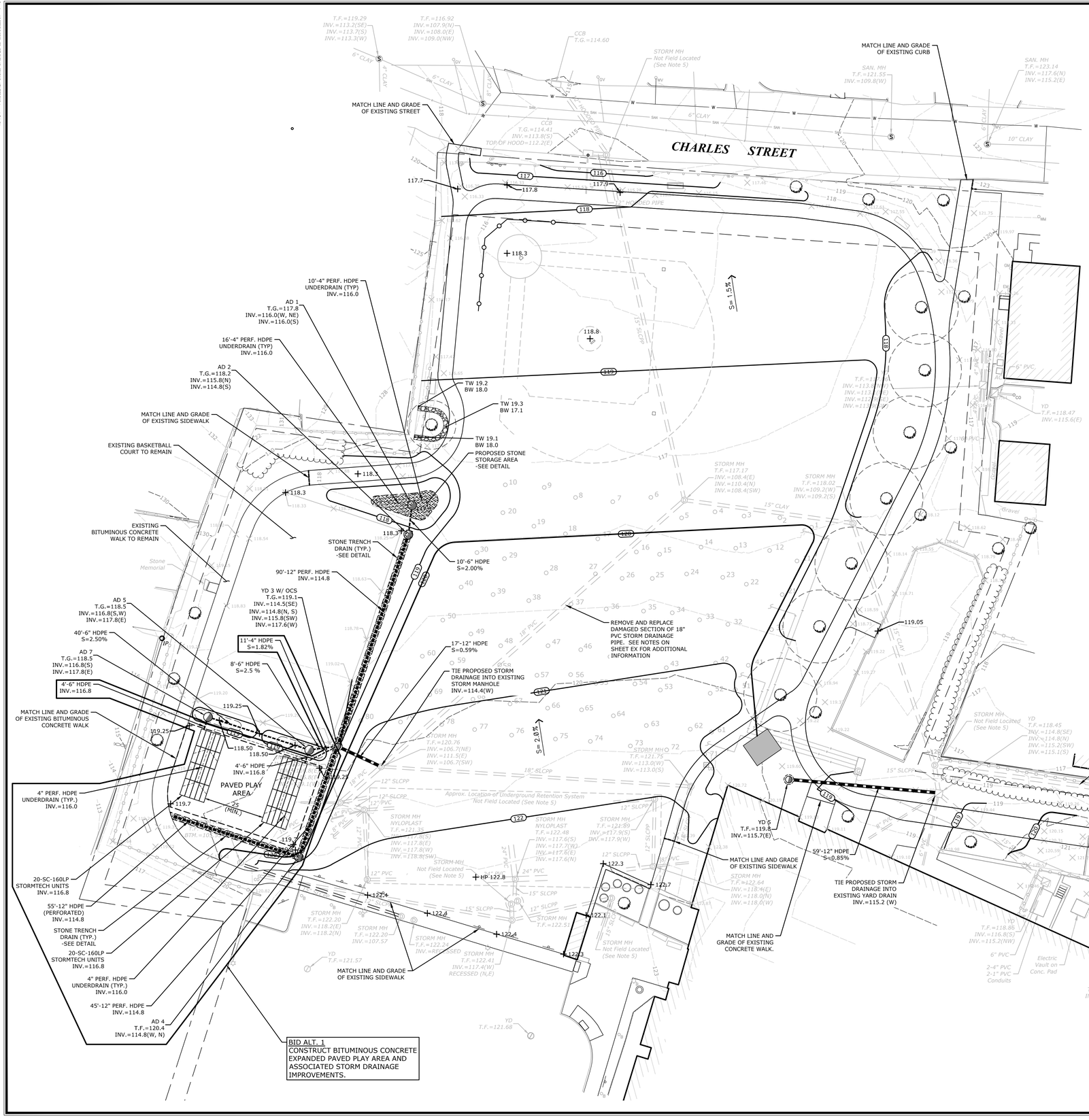

GRADING NOTES:

1. ACCESSIBLE ROUTE SLOPES SHALL BE 1:20 (5%) OR LESS AND THE CROSS SLOPES SHALL NOT EXCEED 1:50 (2%). CHANGES IN LEVELS SHALL NOT BE GREATER THAN 1/2 INCH, AND SLOPES SHALL NOT BE GREATER THAN 1:20 UNLESS RAMPS OR LIFTS ARE PROVIDED.
2. IN ALL CASES IN WHICH PROPOSED ROADS, SIDEWALKS AND CURBING WILL BE TIED INTO EXISTING ROAD/SIDEWALK AND/OR CURBS THE CONTRACTOR SHALL MATCH THE LINE AND GRADE OF THE EXISTING SITE.
3. TAKE NOTE TO PROTECT ROOT ZONES OF EXISTING TREES ROOT ZONES DURING CONSTRUCTION AS SHOWN ON PLANS.

GRADING LEGEND

× 70.5	EXISTING SPOT ELEVATION
+ 70.5	PROPPOSED SPOT ELEVATION
——70——	EXISTING CONTOUR
124	PROPOSED CONTOUR
TC 120.0 / BC 119.5	TOP OF CURB / BOTTOM OF CURB

UTILITY NOTES:

1. ALL PROPOSED PIPE LENGTHS HAVE BEEN MEASURED FROM OUTER WALL-TO-OUTER WALL OF STRUCTURE.
2. LOCATIONS OF ALL EXISTING UTILITIES ARE APPROXIMATE.

UTILITY LEGEND

	STORM AREA DRAIN
	STORM YARD DRAIN
	STORM DRAIN PIPE - SIZE VARIES

N
W E
S
0' 10' 20'
0 1/2" 1"

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SITE PLAN - GRADING AND UTILITIES

HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION

184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

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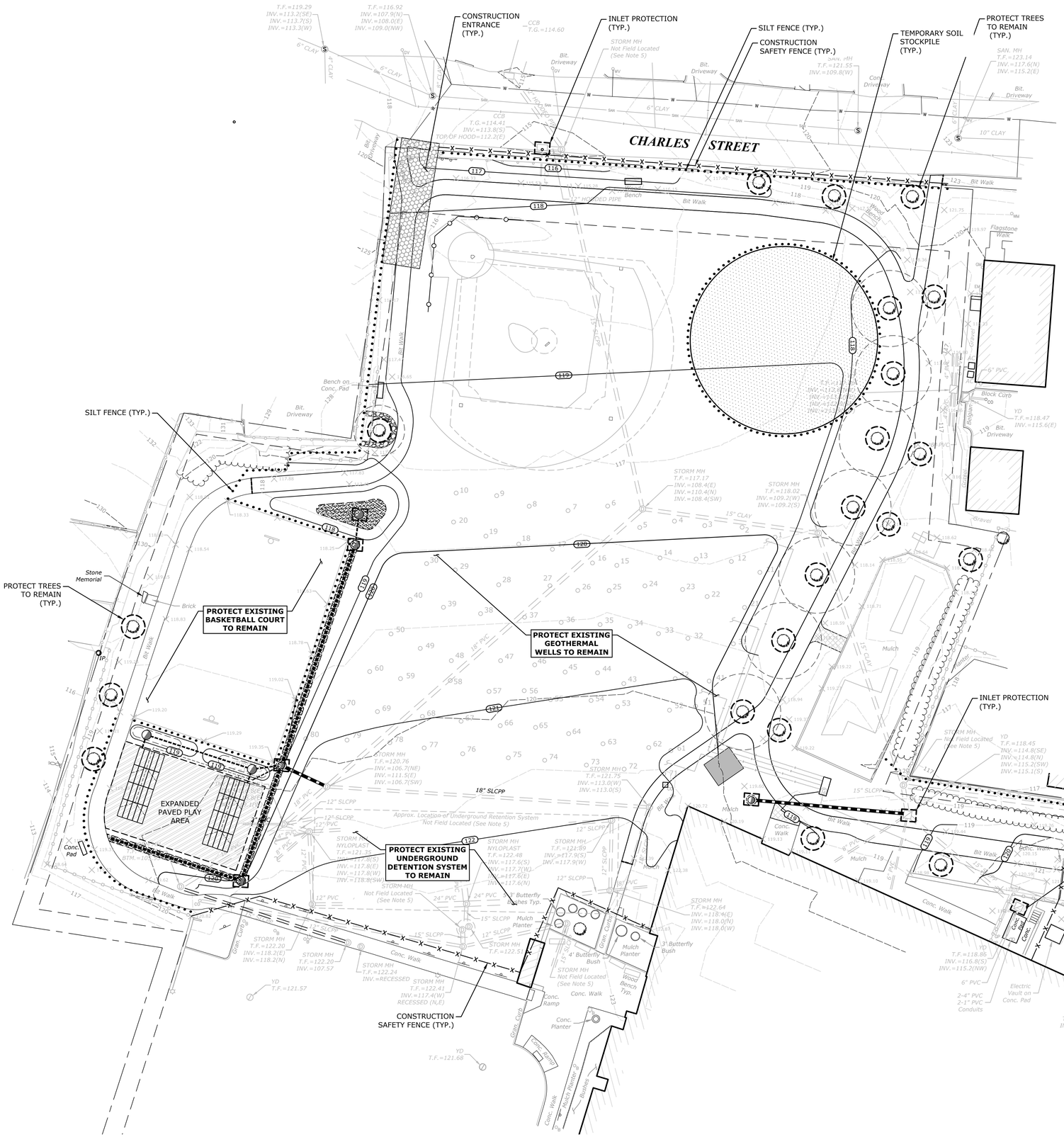


CONSTRUCTION SEQUENCE

1. PRIOR TO COMMENCEMENT OF WORK A PRECONSTRUCTION MEETING SHALL BE HELD WITH TOWN STAFF AND REPRESENTATIVES OF THE CONTRACTOR AND OWNER. AT THIS MEETING, ONE PERSON WILL BE PLACED IN CHARGE OF SEDIMENT AND EROSION CONTROL FOR THE ENTIRE SITE.
2. CONTRACTOR TO STAKE OUT LIMIT OF DISTURBANCE AND VEGETATION TO BE RETAINED. NO DISTURBANCE IS TO TAKE PLACE BEYOND THE LIMITS OF WORK SHOWN.
3. SEDIMENT FILTER FENCE TO BE INSTALLED PRIOR TO GRUBBING STUMPS, STRIPPING OF TOPSOIL, AND MASS EARTHWORK OPERATIONS.
4. CONSTRUCTION ENTRANCE PAD SHALL BE INSTALLED PRIOR TO ANY REMOVAL OF MATERIALS FROM THE SITE OR DELIVERY TO THE SITE.
5. CLEAR AND GRUB SITE AND STOCKPILE TOPSOIL. TOWN STAFF SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO ANY GRADING OR STUMPING AND UPON COMPLETION OF WORK. THE PURPOSE IS TO REVIEW THE PROPER AND SATISFACTORY INSTALLATION OF EROSION AND SEDIMENTATION CONTROLS, AND THE RESTORATION OF THE DISTURBED AREAS. PLACE SEDIMENT FILTER FENCE AROUND STOCKPILES.
6. INITIATE MASS EARTHWORK OPERATIONS AFTER ALL SILT FENCE & HAYBALES ARE INSTALLED. SLOPES ARE TO BE ESTABLISHED AS SOON AS PRACTICAL.
7. INSTALL UNDERGROUND UTILITIES. STABILIZE ALL SLOPES IMMEDIATELY AFTER THEIR ESTABLISHMENT.
8. INLET PROTECTION SHALL BE INSTALLED UPON COMPLETION OF EACH GRATE FRAMED STRUCTURE.
9. INSTALL RETAINING WALLS, SITE UTILITIES, SIDEWALKS AND DRIVEWAYS.
10. ALL SEDIMENT AND EROSION CONTROLS SHALL BE INSPECTED AFTER EACH RAIN STORM EVENT OVER 0.5" OF RAIN OR ONCE EVERY TWO WEEKS.
11. ALL CATCH BASIN SUMPS TO BE CLEANED OF ACCUMULATED SEDIMENT.

SOIL EROSION AND SEDIMENT CONTROL NARRATIVE

SEDIMENT AND EROSION CONTROL MEASURES AS DEPICTED ON THESE PLANS AND DESCRIBED WITHIN THE SEDIMENT AND EROSION CONTROL NARRATIVE SHALL BE IMPLEMENTED AND MAINTAINED UNTIL PERMANENT COVER AND STABILIZATION IS ESTABLISHED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL CONFORM TO THE "GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, CONNECTICUT - 2002", TOWN REQUIREMENTS, AND IN ALL CASES BEST MANAGEMENT PRACTICES SHALL PREVAIL.

1. PURPOSE AND DESCRIPTION OF PROJECT
A. THE RENOVATION AND EXPANSION OF AN EXISTING PLAY FIELD. DISTURBED AREA: ±1.8 ACRES

2. IDENTIFICATION OF EROSION AND SEDIMENT CONTROL CONCERNS
A. CUTS AND FILLS ASSOCIATED WITH THE CONSTRUCTION OF THE NEW FIELD AND ASSOCIATED IMPROVEMENTS.
B. PROTECTION OF EXISTING AND PROPOSED STORM DRAINAGE SYSTEM.

3. IDENTIFICATION OF OTHER POSSIBLE PERMITS
- BUILDING PERMITS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

4. TENTATIVE CONSTRUCTION SCHEDULE
TENTATIVE START DATE:SPRING 2020
TENTATIVE COMPLETION DATE:FALL 2020

EROSION CONTROL LEGEND

- CONSTRUCTION ENTRANCE (CE)
- SEDIMENT FILTER FENCE
- CONSTRUCTION SAFETY FENCE
- TEMPORARY STOCKPILE SURROUND WITH SEDIMENT FILTER FENCE
- INLET PROTECTION (IP) SILT SACK® 'TYPE A' OR APPROVED EQUAL
- TREE PROTECTION

MILONE & MACBROOM
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
WWW.MMINC.COM

DESCRIPTION	DATE	BY

SEDIMENT AND EROSION CONTROL PLAN
HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION
184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

KCF	JJM	KCF
DESIGNED	DRAWN	CHECKED

SCALE: 1"=20'
DATE: DECEMBER 20, 2019
PROJECT NO.: 5062-08

SHEET NAME: SE-1

SEDIMENT & EROSION CONTROL SPECIFICATIONS

GENERAL:

THESE GUIDELINES SHALL APPLY TO ALL WORK CONSISTING OF ANY AND ALL TEMPORARY AND/OR PERMANENT MEASURES TO CONTROL WATER POLLUTION AND SOIL EROSION, AS MAY BE REQUIRED, DURING THE CONSTRUCTION OF THE PROJECT.

IN GENERAL, ALL CONSTRUCTION ACTIVITIES SHALL PROCEED IN SUCH A MANNER SO AS NOT TO POLLUTE ANY WETLANDS, WATERCOURSE, WATERBODY, AND CONDUIT CARRYING WATER, ETC. THE CONTRACTOR SHALL LIMIT, INSOFAR AS POSSIBLE, THE SURFACE AREA OF EARTH MATERIALS EXPOSED BY CONSTRUCTION METHODS AND IMMEDIATELY PROVIDE PERMANENT AND TEMPORARY POLLUTION CONTROL MEASURES TO PREVENT CONTAMINATION OF ADJACENT WETLANDS, WATERCOURSES, AND WATERBODIES, AND TO PREVENT, INSOFAR AS POSSIBLE, EROSION ON THE SITE.

LAND GRADING

GENERAL:

1. THE RESHAPING OF THE GROUND SURFACE BY EXCAVATION AND FILLING OR A COMBINATION OF BOTH, TO OBTAIN PLANNED GRADES, SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
   a. THE CUT FACE OF EARTH EXCAVATION SHALL NOT BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1).
   b. THE PERMANENT EXPOSED FACES OF FILLS SHALL NOT BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1).
   c. THE CUT FACE OF ROCK EXCAVATION SHALL NOT BE STEEPER THAN ONE HORIZONTAL TO FOUR VERTICAL (1:4).
   d. PROVISION SHOULD BE MADE TO CONDUCT SURFACE WATER SAFELY TO STORM DRAINS TO PREVENT SURFACE RUNOFF FROM DAMAGING CUT FACES AND FILL SLOPES.
   e. EXCAVATIONS SHOULD NOT BE MADE SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTY WITHOUT PROTECTING SUCH PROPERTY FROM EROSION, SLIDING, SETTLING, OR CRACKING.
   f. NO FILL SHOULD BE PLACED WHERE IT WILL SLIDE OR WASH UPON THE PREMISES OF ANOTHER OWNER OR UPON ADJACENT WETLANDS, WATERCOURSES, OR WATERBODIES.
   g. PRIOR TO ANY REGRADING, A STABILIZED CONSTRUCTION ENTERANCE SHALL BE PLACED AT THE ENTRANCE TO THE WORK AREA IN ORDER TO REDUCE MUD AND OTHER SEDIMENTS FROM LEAVING THE SITE.

TOPSOILING

GENERAL:

1. TOPSOIL SHALL BE SPREAD OVER ALL EXPOSED AREAS IN ORDER TO PROVIDE A SOIL MEDIUM HAVING FAVORABLE CHARACTERISTICS FOR THE ESTABLISHMENT, GROWTH, AND MAINTENANCE OF VEGETATION.
2. UPON ATTAINING FINAL SUBGRADES, SCARIFY SURFACE TO PROVIDE A GOOD BOND WITH TOPSOIL.
3. REMOVE ALL LARGE STONES, TREE LIMBS, ROOTS AND CONSTRUCTION DEBRIS.
4. APPLY LIME ACCORDING TO SOIL TEST OR AT THE RATE OF TWO (2) TONS PER ACRE.

MATERIAL:

1. TOPSOIL SHOULD HAVE PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS FAVORABLE TO THE GROWTH OF PLANTS.
2. TOPSOIL SHOULD HAVE A SANDY OR LOAMY TEXTURE.
3. TOPSOIL SHOULD BE RELATIVELY FREE OF SUBSOIL MATERIAL AND MUST BE FREE OF STONES LARGER THAN 1.25", LUMPS OF SOIL, ROOTS, TREE LIMBS, TRASH, OR CONSTRUCTION DEBRIS. IT SHOULD BE FREE OF ROOTS OR RHIZOMES SUCH AS THISTLE, NUTGRASS, AND QUACKGRASS.
4. AN ORGANIC MATTER CONTENT OF SIX PERCENT (6%) IS REQUIRED. AVOID LIGHT COLORED SUBSOIL MATERIAL.
5. SOLUBLE SALT CONTENT OF OVER 500 PARTS PER MILLION (PPM) IS LESS SUITABLE. AVOID TIDAL MARSH SOILS BECAUSE OF HIGH SALT CONTENT
6. THE pH SHOULD BE 5.5 TO 7 IF LESS, ADD LIME TO INCREASE pH TO AN ACCEPTABLE LEVEL.

EXECUTION

1. AVOID SPREADING WHEN TOPSOIL IS WET OR FROZEN.
2. SPREAD TOPSOIL UNIFORMLY TO A DEPTH OF AT LEAST SIX INCHES (6"), OR TO THE DEPTH SHOWN ON THE LANDSCAPING PLANS.

PERMANENT VEGETATIVE COVER

GENERAL:

1. PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED AS VARIOUS SECTIONS OF THE PROJECT ARE COMPLETED IN ORDER TO STABILIZE THE SOIL, REDUCE DOWNSTREAM DAMAGE FROM SEDIMENT AND RUNOFF, AND TO ENHANCE THE AESTHETIC NATURE OF THE SITE. IT WILL BE APPLIED TO ALL CONSTRUCTION AREAS SUBJECT TO EROSION WHERE FINAL GRADING HAS BEEN COMPLETED AND A PERMANENT COVER IS NEEDED.

SITE PREPARATION:

1. INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.
2. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.
3. PERFORM ALL PLANTING OPERATIONS PARALLEL TO THE CONTOURS OF THE SLOPE.
4. APPLY TOPSOIL AS INDICATED ELSEWHERE HEREIN.
5. APPLY FERTILIZER ACCORDING TO SOIL TEST OR PER THE TECHNICAL SPECIFICATIONS.

TEMPORARY VEGETATIVE COVER

1. TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED ON ALL UNPROTECTED AREAS THAT PRODUCE SEDIMENT, AREAS WHERE FINAL GRADING HAS BEEN COMPLETED, AND AREAS WHERE THE ESTIMATED PERIOD OF BARE SOIL EXPOSURE IS LESS THAN 12 MONTHS. TEMPORARY VEGETATIVE COVER SHALL BE APPLIED IF AREAS WILL NOT BE PERMANENTLY SEEDED BY SEPTEMBER 1.

GENERAL:

1. INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.
2. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.
3. APPLY LIME ACCORDING TO SOIL TEST OR AT A RATE OF TWO (2) TON OF GROUND DOLOMITIC LIMESTONE PER ACRE (5 LBS. PER 100 SQ. FT.).
4. APPLY FERTILIZER ACCORDING TO SOIL TEST OR AT THE RATE OF 300 LBS. OF 10-10-10 PER ACRE (7 LBS. PER 1,000 SQ. FT.) AND SECOND APPLICATION OF 200 LBS. OF 10-10-10- (5 LBS. PER 1,000 SQ. FT.) WHEN GRASS IS FOUR INCHES (4") TO SIX INCHES (6") HIGH. APPLY ONLY WHEN GRASS IS DRY.
5. UNLESS HYDROSEEDED, WORK IN LIME AND FERTILIZER TO A DEPTH OF FOUR (4") INCHES USING A DISK OR ANY SUITABLE EQUIPMENT.
6. TILLAGE SHOULD ACHIEVE A REASONABLY UNIFORM LOOSE SEEDBED. WORK ON CONTOUR IF SITE IS SLOPING.

SITE PREPARATION:

1. SELECT APPROPRIATE SPECIES FOR THE SITUATION. NOTE RATES AND SEEDING DATES (SEE VEGETATIVE COVER SELECTION & MULCHING
2. APPLY SEED UNIFORMLY ACCORDING TO THE RATE INDICATED BY BROADCASTING, DRILLING, OR HYDRAULIC APPLICATION.
3. UNLESS HYDROSEEDED, COVER RYEGRASS SEEDS WITH NOT MORE THAN 1/4 INCH OF SOIL USING SUITABLE EQUIPMENT.
4. MULCH IMMEDIATELY AFTER SEEDING IF REQUIRED. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW.) APPLY STRAW OR HAY MULCH AND ANCHOR TO SLOPES GREATER THAN 3% OR WHERE NEEDED.

VEGETATIVE COVER SELECTION & MULCHING

TEMPORARY VEGETATIVE COVER:

PERENNIAL RYEGRASS 5 LBS./1,000 SQ.FT. (LOLIUM PERENNE)

* PERMANENT VEGETATIVE COVER: SEE SPECIFICATIONS

TEMPORARY MULCHING:

CLEAN DRY STRAW OR HAY FREE OF WEEDS WITH A MULCH TACKIFIER 70-90 LBS./1,000 SQ.FT. (TEMPORARY VEGETATIVE AREAS)

WOOD FIBER IN HYDROMULCH SLURRY 25-50 LBS./1,000 SQ. FT.

ESTABLISHMENT:

1. SMOOTH AND FIRM SEEDBED WITH CULTIPACKER OR OTHER SIMILAR EQUIPMENT PRIOR TO SEEDING (EXCEPT WHEN HYDROSEEDING).
2. SELECT ADAPTED SEED MIXTURE FOR THE SPECIFIC SITUATION. NOTE RATES AND THE SEEDING DATES (SEE VEGETATIVE COVER SELECTION & MULCHING SPEC. ABOVE).
3. APPLY SEED UNIFORMLY ACCORDING TO RATE INDICATED, BY BROADCASTING, DRILLING, OR HYDRAULIC APPLICATION.
4. COVER GRASS AND LEGUME SEED WITH NOT MORE THAN 1/4 INCH OF SOIL WITH SUITABLE EQUIPMENT (EXCEPT WHEN HYDROSEEDING).
5. MULCH IMMEDIATELY AFTER SEEDING, IF REQUIRED, ACCORDING TO TEMPORARY MULCHING SPECIFICATIONS. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION ABOVE).
6. USE PROPER INOCULANT ON ALL LEGUME SEEDINGS, USE FOUR (4) TIMES NORMAL RATES WHEN HYDROSEEDING.
7. USE SOD WHERE THERE IS A HEAVY CONCENTRATION OF WATER AND IN CRITICAL AREAS WHERE IT IS IMPORTANT TO GET A QUICK VEGETATIVE COVER TO PREVENT EROSION.

MAINTENANCE:

1. TEST FOR SOIL ACIDITY EVERY THREE (3) YEARS AND LIME AS REQUIRED.
2. ON SITES WHERE GRASSES PREDOMINATE, BROADCAST ANNUALLY 500 POUNDS OF 10-10-10 FERTILIZER PER ACRE (12 LBS. PER 1,000 SQ. FT.) OR AS NEEDED ACCORDING TO ANNUAL SOIL TESTS.
3. ON SITES WHERE LEGUMES PREDOMINATE, BROADCAST EVERY THREE (3) YEARS OR AS INDICATED BY SOIL TEST 300 POUNDS OF 0-20-20 OR EQUIVALENT PER ACRE (8 LBS PER 1,000 SQ. FT.).

EROSION CHECKS

GENERAL:

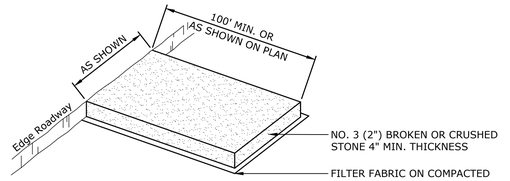
1. TEMPORARY PERVIOUS BARRIERS USING BALES OF HAY OR STRAW, HELD IN PLACE WITH STAKES DRIVEN THROUGH THE BALES AND INTO THE GROUND OR GEOTEXTILE FABRIC FASTENED TO A FENCE POST AND BURIED INTO THE GROUND, SHALL BE INSTALLED AND MAINTAINED AS REQUIRED TO CHECK EROSION AND REDUCE SEDIMENTATION.

CONSTRUCTION:

1. BALES SHOULD BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED INTO THE SOIL A MINIMUM OF FOUR (6") INCHES.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY WOOD STAKES OR REINFORCEMENT BARS DRIVEN THROUGH THE BALES AND INTO THE GROUND. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD THE PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
4. GEOTEXTILE FABRIC SHALL BE SECURELY ANCHORED AT THE TOP OF A THREE FOOT (3') HIGH FENCE AND BURIED A MINIMUM OF SIX INCHES (6") TO THE SOIL. SEAMS BETWEEN SECTIONS OF FILTER FABRIC SHALL OVERLAP A MINIMUM OF TWO FEET (2').

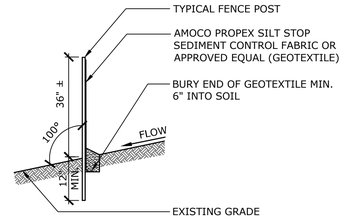
INSTALLATION AND MAINTENANCE:

1. BALED HAY EROSION BARRIERS SHALL BE INSTALLED AT ALL STORM SEWER INLETS.
2. BALED HAY EROSION BARRIERS AND GEOTEXTILE FENCE SHALL BE INSTALLED AT THE LOCATION INDICATED ON THE PLAN AND IN ADDITIONAL AREAS AS MAY BE DEEMED APPROPRIATE DURING CONSTRUCTION.
3. ALL EROSION CHECKS SHALL BE MAINTAINED UNTIL ADJACENT AREAS ARE STABILIZED.
4. INSPECTION SHALL BE FREQUENT (PER TABLE BELOW) AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. EROSION CHECKS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORMWATER FLOW OR DRAINAGE.

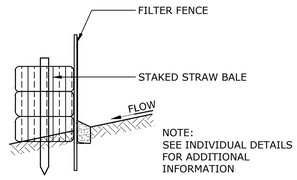


NOTE: CONSTRUCTION ENTRANCE PAD SHALL BE INSTALLED AND MAINTAINED DURING OPERATIONS WHICH PROMOTE VEHICULAR TRACKING OF MUD

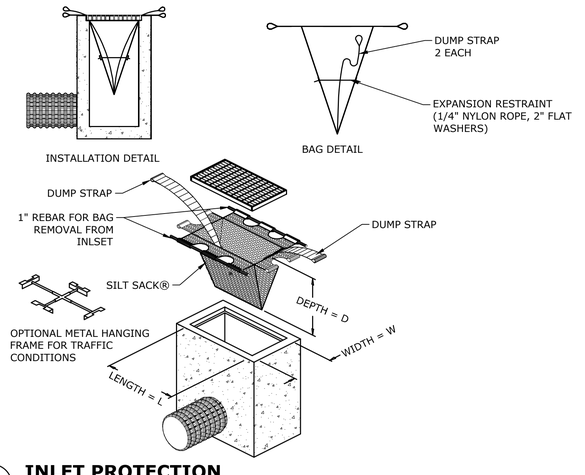
1 **CONSTRUCTION ENTRANCE PAD**
N.T.S. P-SC-5062.08-44



2 **SEDIMENT FILTER FENCE**
N.T.S. P-SC-5062.08-42



3 **SEDIMENT FILTER FENCE AND HAYBALE**
N.T.S. P-SC-5062.08-43



4 **INLET PROTECTION**
N.T.S. P-SC-5062.08-39

MILONE & MACBROOM
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
WWW.MMINC.COM

DESCRIPTION	DATE	BY

SEDIMENT EROSION CONTROL SPECIFICATION AND DETAILS

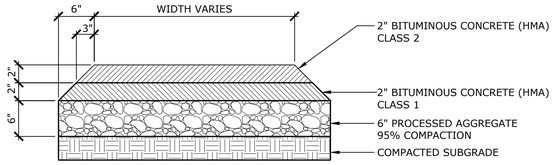
HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION

184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

KCF	JMM	KCF
DESIGNED	DRAWN	CHECKED

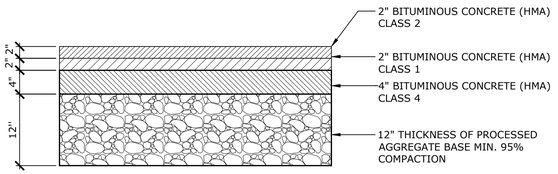
N.T.S. — SCALE
DECEMBER 20, 2019 — DATE
5062-08 — PROJECT NO.
SHEET NO.

SE-2 — SHEET NAME



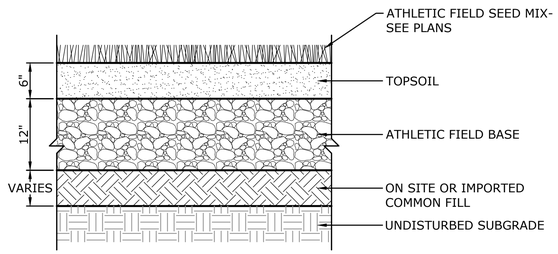
1 BITUMINOUS CONCRETE WALK

NOT TO SCALE P-SC-5062.08-02



2 PAVED PLAY AREA

N.T.S. P-SC-5062.08-57



3 FULL DEPTH FIELD RECONSTRUCTION

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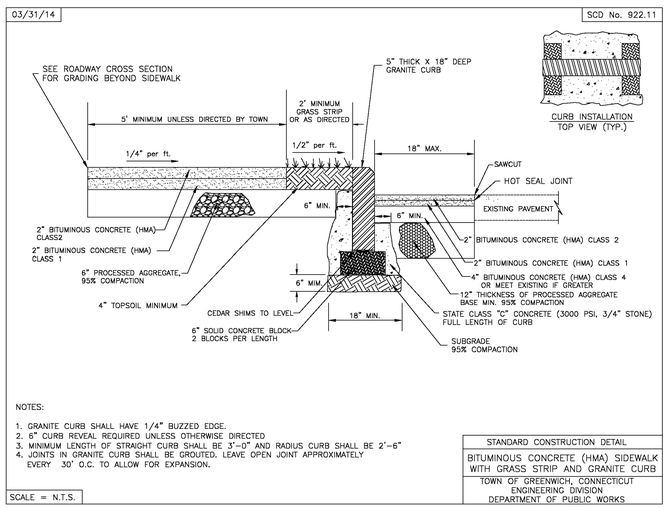
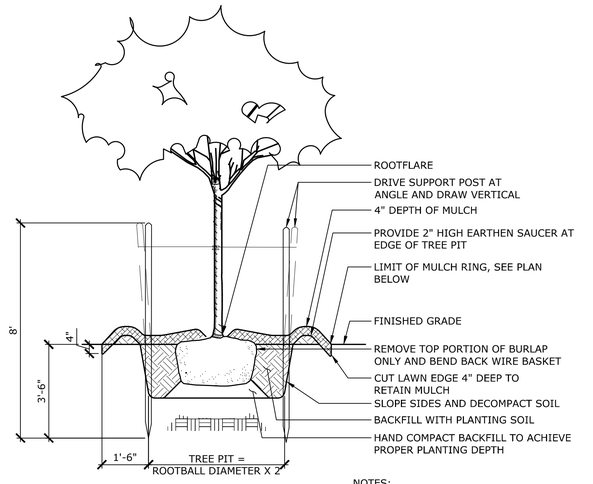
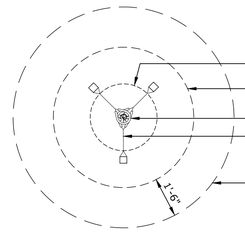




SECTION

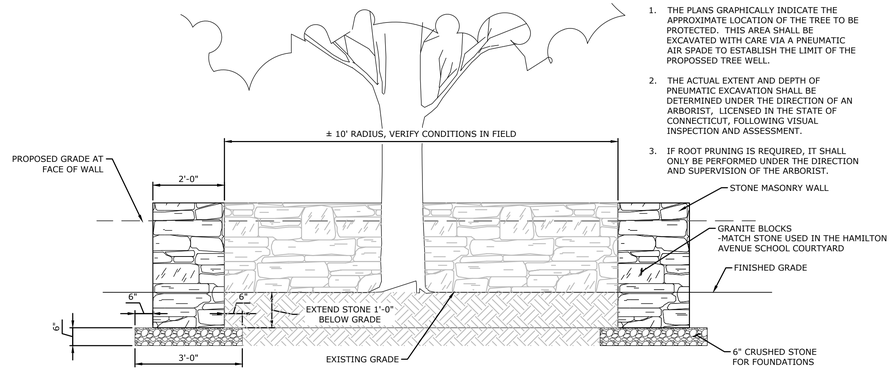


PLAN

NOTES:
1. SUPPORT POSTS SHALL BE REMOVED BY THE CONTRACTOR ONE YEAR AFTER INSTALLATION
2. WHERE TREES ARE PLANTED IN COMPACTED SOILS CONTRACTOR TO INSURE PLANT PIT DRAINS 1.5"/ HOUR
3. DO NOT COVER TREE TRUNK WITH MULCH

7 TREE PLANTING

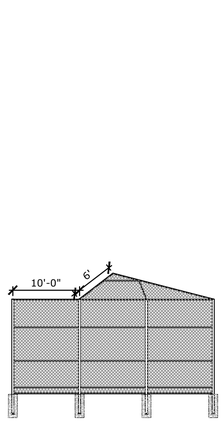
NOT TO SCALE P-SC-5062.08-15



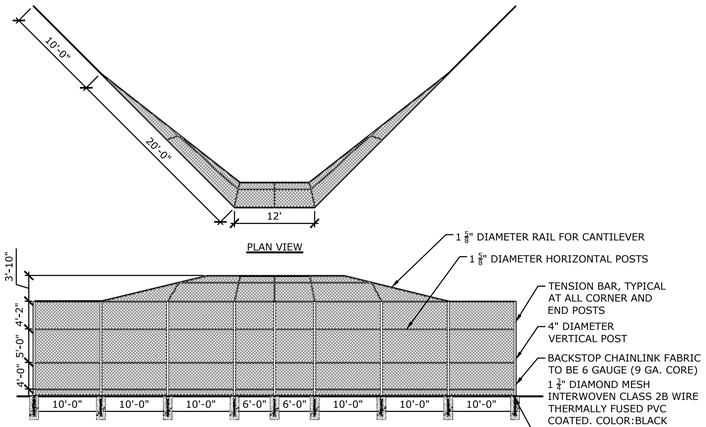
NOTES:
1. THE PLANS GRAPHICALLY INDICATE THE APPROXIMATE LOCATION OF THE TREE TO BE PROTECTED. THIS AREA SHALL BE EXCAVATED WITH CARE VIA A PNEUMATIC AIR SPADE TO ESTABLISH THE LIMIT OF THE PROPOSSED TREE WELL.
2. THE ACTUAL EXTENT AND DEPTH OF PNEUMATIC EXCAVATION SHALL BE DETERMINED UNDER THE DIRECTION OF AN ARBORIST, LICENSED IN THE STATE OF CONNECTICUT, FOLLOWING VISUAL INSPECTION AND ASSESSMENT.
3. IF ROOT PRUNING IS REQUIRED, IT SHALL ONLY BE PERFORMED UNDER THE DIRECTION AND SUPERVISION OF THE ARBORIST.

STONE MASONRY TREE WELL

NOT TO SCALE



FOOTING TO BE 3' 6" DEEP, 16" WIDE USING CLASS C CONCRETE



NOTES:
1. ALL POSTS, HARDWARE AND FITTINGS TO BE THERMALLY FUSED AND BONDED PVC COATED. SEE SPECIFICATION
2. SEE CONSTRUCTION SPECIFICATIONS FOR CONSTRUCTION METHODS
3. RAILS TO BE INCLUDED AT 1' AND 5' HIGH
4. FOOTING TO BE 3' 6" DEEP, 16" DIAMETER USING CLASS C CONCRETE
5. CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION

18' HT. BACKSTOP

NOT TO SCALE

MILONE & MACBROOM
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
WWW.MMINC.COM

DESCRIPTION | DATE | BY

SITE DETAILS

HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION
184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

KCF	JJM	KCF
DESIGNED	DRAWN	CHECKED

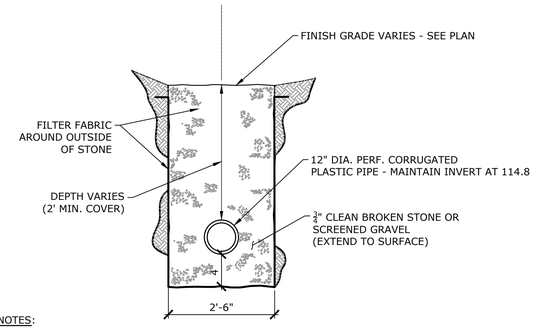
AS NOTED
SCALE

DECEMBER 20, 2019
DATE

5062-08
PROJECT NO.

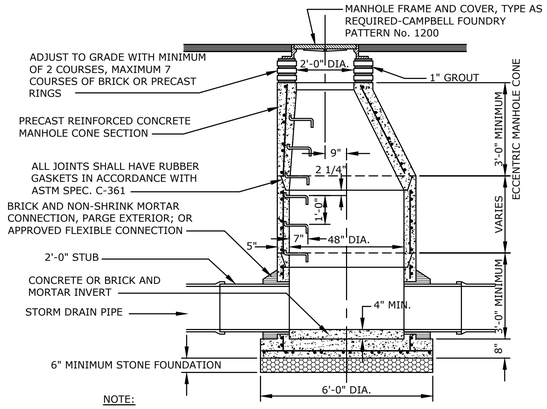
SHEET NO.

SD-1
SHEET NAME



NOTES:
1. FINISHED GRADE ADJACENT TO THE STONE TRENCH DRAIN SHALL BE RESHAPED TO PROVIDE POSITIVE DRAINAGE TOWARDS THE TRENCH.
2. SOILS BELOW THE STONE TRENCH DRAIN SHALL BE SCARIFIED OR TILLED TO PROMOTE AND MAXIMIZE INFILTRATION.
3. ALL GRADING SHALL OCCUR OUTSIDE THE ADJACENT PLAYING FIELD SURFACE.
4. ALL DISTURBED AREAS SHALL RECEIVE TOPSOIL AND SOD.
5. THERE SHALL BE NO CUTTING OR CLEARING OF EXISTING VEGETATION FOR THE INSTALLATION OF THE STONE TRENCH AND PIPING.
6. ALL STRUCTURES SHALL BE FLUSH WITH SURROUNDING FINISHED GRADE.

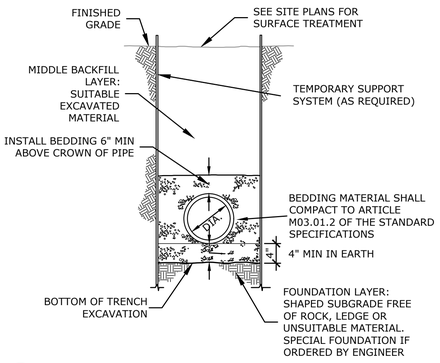
1 STONE TRENCH DRAIN
N.T.S. P-SC-5062.08-12



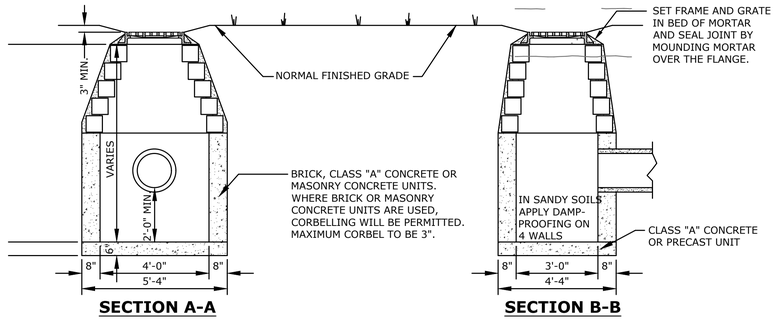
NOTE:

5' OR 6' DIAMETER PRECAST BASES MAY BE REQUIRED DUE TO SIZE OR NUMBER OF PIPES AT THE MANHOLE. PRECAST REDUCERS WILL BE PLACED ABOVE THE 5' OR 6' BASES AS DIRECTED BY THE ENGINEER. WALL THICKNESS TO INCREASE BY 1" FOR EACH 1'-0" OF INSIDE DIAMETER.

2 PRECAST CONCRETE STORM DRAINAGE MANHOLE
N.T.S. P-SC-5062.08-86

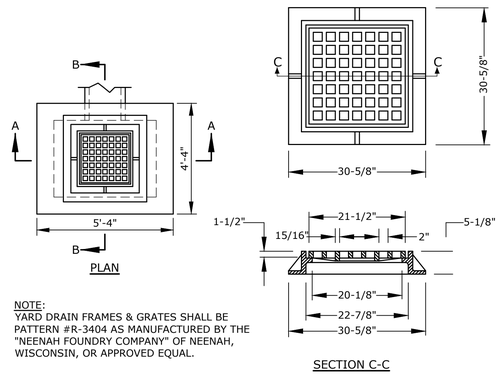


3 STORM DRAIN TRENCH
N.T.S. P-SC-5062.08-18



SECTION A-A SECTION B-B

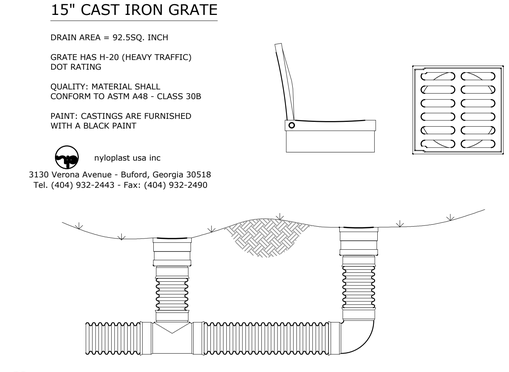
4 YARD DRAIN
N.T.S. P-SC-5062.08-87



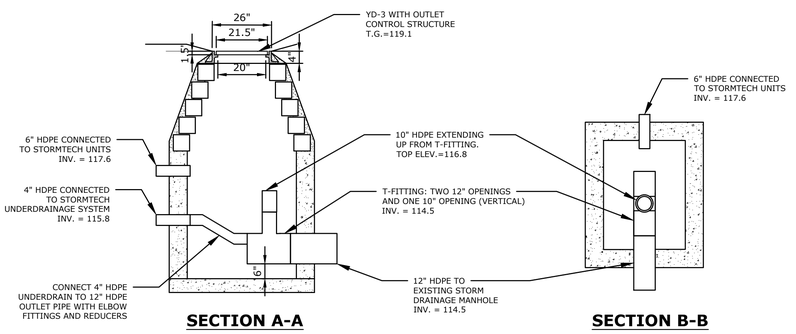
NOTE:
YARD DRAIN FRAMES & GRATES SHALL BE PATTERN #R-3404 AS MANUFACTURED BY THE "NEENAH FOUNDRY COMPANY" OF NEENAH, WISCONSIN, OR APPROVED EQUAL.

SECTION C-C

5 YARD DRAIN FRAME & GRATE
N.T.S. P-SC-5062.08-88



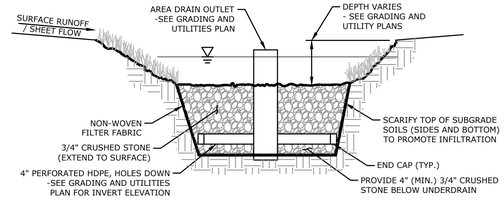
6 AREA DRAIN AND GRATE
N.T.S.



SECTION A-A SECTION B-B

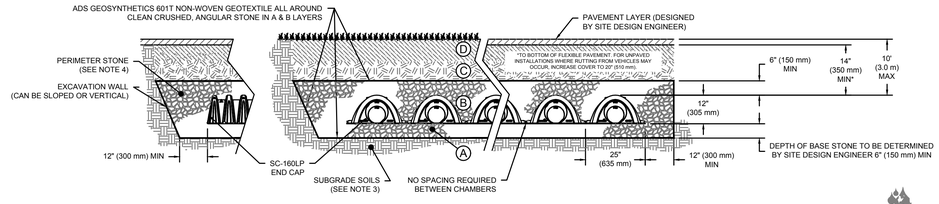
NOTES:
1. RISER STRUCTURE TO BE INSTALLED IN TYPICAL YARD DRAIN STRUCTURE, SEE DETAIL.
2. FRAME AND GRATE SHALL BE PATTERN R-6665-2GP AS MANUFACTURED BY THE "NEENAH FOUNDRY COMPANY" OF NEENAH, WISCONSIN, OR APPROVED EQUAL. THIS PATTERN IS A SOLID MANHOLE FRAME WITH A BOLTED/GASKETED LID.

7 TRENCH DRAIN OUTLET CONTROL STRUCTURE
N.T.S.



NOTES: THIS DETAIL IS FOR GRAPHIC PURPOSES ONLY AND IS NOT TO SCALE. SEE GRADING AND UTILITIES PLAN FOR ADDITIONAL INFORMATION

8 STONE STORAGE AREA
N.T.S.



NOTES:
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 1.5"
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
6. SOILS BELOW THE STORMTECH UNITS SHALL BE SCARIFIED OR TILLED TO PROMOTE AND MAXIMIZE INFILTRATION.

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DESCRIPTION	DATE	BY

SITE DETAILS

HAMILTON AVENUE SCHOOL
NATURAL GRASS FIELD RECONSTRUCTION

184 HAMILTON AVENUE
GREENWICH, CONNECTICUT

BC	JJM	DJK
DESIGNED	DRAWN	CHECKED

N.T.S. — SCALE

DECEMBER 20, 2019 — DATE

5062-08 — PROJECT NO.

SHEET NO.

SD-2 — SHEET NAME