Deans Mill Elementary School (S.P.N. 137-0047)

& West Vine Street School (S.P.N.137-0048)

Additions and Renovations

Stonington Public Schools

Stonington, CT

Request for Proposals for

Third Party Independent Structural Review

RFP No. 2016-012

LEGAL NOTICE

STONINGTON PUBLIC SCHOOL,

STONINGTON, CONNECTICUT

REQUEST FOR PROPOSALS FOR THIRD PARTY INDEPENDENT

STRUCTURAL REVIEW SERVICES

RFP No. 2016-012

October 14, 2016

The Town of Stonington, on behalf of the Stonington K-12 Building Committee, will receive sealed proposals for the provision of third party independent structural reviews for the additions and renovations to the Deans Mill and West Vine Street Elementary Schools. Proposals are due no later than **2:00 p.m. on October 28, 2016** to:

Mr. James Sullivan
Director of Finance
Town of Stonington
152 Elm Street
Stonington, CT 06378

The documents comprising the Bid Specifications may be obtained on the Town's website, under http://www.stonington-ct.gov/bids-rfps or on the CT DAS contracting portal.

Any addenda will be posted to the Town's website along with the CT DAS contracting portal. All firms are responsible for checking for new addenda. Proposals will be opened and read aloud at **2:00 p.m., October 28, 2016**, Town of Stonington, 152 Elm Street, Stonington, CT 06378.

The Town of Stonington reserves the rights to amend or terminate this Request for Proposal, to reject any or all proposers, to request additional information, to waive any informalities or non-material deficiencies in a response, and to take any and all other action that, in the Town's sole judgment, will be in its best interests.

STONINGTON PUBLIC SCHOOL
STONINGTON, CONNECTICUT

REQUEST FOR PROPOSALS FOR THIRD PARTY INDEPENDENT STRUCTURAL REVIEW

RFP No. 2016-012

Proposal Issue Date: October 14, 2016

Proposal Closing Date/Time: October 28, 2016, at 2:00PM.

Proposal Closing Place: Town of Stonington, 152 Elm Street, Stonington, CT 06378.

Proposal Opening Date/Time: October 28, 2016, at 2:00 p.m.

Proposal Opening Place: Town of Stonington, 152 Elm Street, Stonington, CT 06378.

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The Town of Stonington, "the Town" is soliciting proposals from qualified individuals or firms to provide third party independent structural reviews services for the design, additions and renovations to the Deans Mill Elementary School and West Vine Street Elementary School (the "School Projects").

PROJECT OVERVIEW

The Deans Mill Elementary School project consists of constructing an approximately 53,000 sf square foot addition to the north end of the original school, renovating the original school and demolishing the 1975 west addition. The new addition is a two-story steel structure supported by spread and wall footings, composite concrete and steel second floor, multi-wythe masonry exterior walls, and slab-on-grade floors (see attached structural foundation and framing plans.)

The West Vine Street School project consists of constructing an approximately 45,000 sf square foot addition to the north end of the original school and renovating the original school. The new addition is a two-story steel structure supported by spread and wall footings, composite concrete and steel second floor, multi-wythe masonry exterior walls, and slab-on-grade floors (see attached structural foundation and framing plans.)

The architect is Drummey Rosane Anderson, Inc. (DRA) and the structural engineer is Szewczak Associates.

SCOPE OF SERVICES

The selected structural firm or individual shall provide a structural engineering review of the structural plans and specifications of the proposed structure in accordance with Conn. Gen. Stat. § 29-276(b). The structural firm or individual shall submit to the Stonington K-12 Building Committee, via the (OPM), a written report of its structural review of the proposed structure and shall identify

any members, systems, and/or components of the primary structural support systems that do not comply with the requirements of the State Building Code.

Included as attachments to this RFP are three (3) geotechnical reports prepared by GNCB Engineers, two for Deans Mill Elementary School and one for West Vine Elementary School.

- GNCB Report on Geotechnical Engineering Investigation for Deans Mill School dated August 25, 2016
- GNCB Report on Geotechnical Engineering Investigation for Deans Mill School dated September 28, 2016
- GNCB Report on Geotechnical Engineering Investigation for West Vine Street School dated August 25, 2016

Also included as part of this RFP are the Design Development architectural and structural plans as well as the structural specifications for the project. Due to file size, proposers may request these documents from the OPM, Colliers International by emailing Mr. Scott Pellman at scott.pellman@colliers.com . The intent of providing these documents is to provide proposers with a general idea of the size and scope of the project in order to prepare their proposals only.

Per Conn. Gen. Stat. § 29-276(b), should the structural plans for design specification be modified, the selected firm shall review such modifications for compliance with the State Building Code. Such modifications will be performed on a time and materials basis to be paid for the by the owner at the hourly rates submitted with this proposal.

DEADLINES FOR REVIEW

The structural firm or individual will have thirty (30) calendars days from receipt of the complete set of plans and project manual to complete their initial review. An original hard copy and a digital copy of the report shall be submitted to the Stonington K-12 Building Committee via Mr. James Sullivan at the address noted under "SUBMISSIONS". A digital copy of the review shall also be provided to the OPM, Colliers International/Project Management Northeast, Attn: Scott Pellman Email: Scott.pellman@colliers.com as well as the architect of record, DRA, Attn: Anwar Hossain, Email: ahossain@draws.com .

Upon receipt of written response by the architect/engineer of record, the structural firm will have seven (7) calendar days to review the response. Should the structural firm require more than seven (7) calendar days it shall notify the OPM via email.

QUALIFICATIONS

Companies, firms, individuals and other respondents to this Request for Proposal shall be a licensed structural engineer in accordance with Chapter 391 of the Connecticut General Statutes. A copy of their current license shall be included with the proposal.

The purpose of this Request for Proposals is to identify the lowest responsible qualified firm or individual within the meaning of General Statutes § 10-287(b) (1).

SUBMISSIONS

One (1) original and twelve (12) hard copies, along with a digital copy of sealed proposals and all other required documents must be submitted to the following address by the date and time noted above:

Mr. James Sullivan
Director of Finance
Town of Stonington
152 Elm Street
Stonington, CT 06378

The Town will not accept responses by e-mail or fax. The Town will reject responses received after the date and time noted above.

The documents comprising the Bid Specifications may be obtained on the Towns website, http://www.stonington-ct.gov/bids-rfps, or on the CT DAS contracting portal.

Any addenda will be posted to the Town's website along with the CT DAS contracting portal. All firms are responsible for checking for new addenda. Proposals will be opened and read aloud at the time and date noted above.

The Town reserves the right to amend or terminate this Request for Proposals, to reject any or all proposals, to request additional information, to waive any informalities or non-material deficiencies in a response, and to take any and all other action that, in the Town's sole judgment, will be in its best interests.

Proposals must be held firm and cannot be withdrawn for sixty (60) calendar days after the opening date.

This Request for Proposals ("RFP") includes:

- Standard Instructions to Proposers
- Exhibits:
- A) Insurance Requirements
- B) Proposal Form
- C) Proposer's Legal Status Disclosure Form
- D) Proposer's Non Collusion Affidavit Form
- E) Proposer's Statement of References Form
- F) Required Disclosures
- Attachments:
- 1) GNCB Report on Geotechnical Engineering Investigation for Deans Mill School dated August 25, 2016
- 2) GNCB Report on Geotechnical Engineering Investigation for Deans Mill School dated September 28, 2016
- 3) GNCB Report on Geotechnical Engineering Investigation for West Vine Street School dated August 25, 2016
- Addenda, if any

STONINGTON PUBLIC SCHOOL
STONINGTON, CONNECTICUT

STANDARD INSTRUCTIONS TO PROPOSERS

INTRODUCTION

The Town is soliciting proposals for third party independent structural reviews for the renovation/additions to the Deans Mill Elementary and West Vine Street Elementary Schools. This RFP is not a contract offer, and no contract will exist unless and until a written contract is signed by the Town and the successful proposer.

Interested parties should submit a proposal in accordance with the requirements and directions contained in this RFP. **Proposers are prohibited from contacting any Town employee, officer or official concerning this RFP, except as set forth in Section 3, below. A proposer's failure to comply with this requirement may result in disqualification.**

If there are any conflicts between the provisions of these Standard Instructions to Proposers and any other documents comprising this RFP, these Standard Instructions to Proposers shall prevail.

1. RIGHT TO AMEND OR TERMINATE THE RFP OR CONTRACT

The Town may, before or after proposal opening and in its sole discretion, clarify, modify, amend or terminate this RFP if the Town determines it is in the Town's best interest. Any such action shall be effected by a posting on the Town's website, http://www.stonington-ct.gov/bids-rfps. **Each proposer is responsible for checking the Town's website and CT DAS Contracting Portal to determine if the Town has issued any addenda and, if so, to complete its proposal in accordance with the RFP as modified by the addenda.**

2. PROPOSAL SUBMISSION INSTRUCTIONS

Proposals must be received, by the date and time noted above prior to the date and time the proposals are scheduled to be opened publicly. Postmarks prior to the opening date and time do **NOT** satisfy this condition. The Town will not accept submissions by e-mail or fax. Proposers are solely responsible for ensuring timely delivery. The Town will **NOT** accept late proposals.

One (1) original and twelve (12) hard copies, along with a digital copy of all proposal documents must be submitted in sealed, opaque envelopes clearly labeled with the proposer's name, the proposer's address, the words **"Third Party Structural Review Proposal,"** and the **RFP Number 2016-012.** The Town may decline to accept proposals submitted in unmarked envelopes that the Town opens in its normal course of business. The Town may, but shall not be required to, return such proposal documents and inform the proposer that the proposal documents may be resubmitted in a sealed envelope properly marked as described above.

Proposal prices must be submitted on the Proposal Form included in this RFP, see **Exhibit B**. All blank spaces for proposal prices must be completed in ink or be typewritten; proposal prices must be stated in both words and figures. The person signing the Proposal Form must initial any

errors, alterations or corrections on that form. Ditto marks or words such as "SAME" shall not be used in the Proposal Form.

Proposals may be withdrawn personally or in writing provided that the Town receives the withdrawal prior to the date and time the proposals are scheduled to be opened. Proposals are considered valid, and may not be withdrawn, cancelled or modified, for sixty (60) calendar days after the opening date, to give the Town sufficient time to review the proposals, investigate the proposers' qualifications, secure any required municipal approvals, and execute a binding contract with the successful proposer.

An authorized person representing the legal entity of the proposer must sign the Proposal Form and all other forms included in this RFP.

3. QUESTIONS AND AMENDMENTS

Questions concerning the process and procedures applicable to this RFP are to be submitted **only in writing** (including by e-mail or fax) and directed **only to**:

Mr. Scott Pellman
C/o Colliers International
135 New Road
Madison, CT 06443
Email: Scott.pellman@colliers.com
Fax (203) 779-5661

Proposers shall copy Mr. James. Sullivan, jsullivan@stonington-ct.gov as well.

Proposers are prohibited from contacting any Town employee, officer or official concerning this RFP. A proposer's failure to comply with this requirement may result in disqualification.

The appropriate Town representative listed above must receive any questions from proposers no later than five (5) business days before the proposal opening date. That representative will confirm receipt of a proposer's questions by e-mail.

The Town will answer all relevant written questions by issuing one or more addenda, which shall be a part of this RFP and the resulting Contract, containing all questions received as provided for above and decisions regarding same.

At least two (2) calendar days prior to proposal opening, the Town will post any addenda on Town's website, http://www.stonington-ct.gov/bids-rfps or on the CT DAS contracting portal. **Each proposer is responsible for checking the website to determine if the Town has issued any addenda and, if so, to complete its proposal in accordance with the RFP as modified by the addenda.**

No oral statement of the Town, including oral statements by the Town representatives listed above, shall be effective to waive, change or otherwise modify any of the provisions of this RFP, and no proposer shall rely on any alleged oral statement.

4. ADDITIONAL INFORMATION

The Town reserves the right, either before or after the opening of proposals, to ask any proposer to clarify its proposal or to submit additional information that the Town in its sole discretion deems desirable.

5. COSTS FOR PREPARING PROPOSAL

Each proposer's costs incurred in developing its proposal are its sole responsibility, and the Town shall have no liability for such costs.

6. OWNERSHIP OF PROPOSALS

All proposals submitted become the Town's property and will not be returned to proposers.

7. FREEDOM OF INFORMATION ACT

All information submitted in a proposal or in response to a request for additional information is subject to disclosure under the Connecticut Freedom of Information Act as amended and judicially interpreted. A proposer's responses may contain financial, trade secret or other data that it claims should not be public (the "Confidential Information"). A proposer must identify specifically the pages and portions of its proposal or additional information that contain the claimed Confidential Information by visibly marking all such pages and portions. Provided that the proposer cooperates with the Town as described in this section, the Town shall, to the extent permitted by law, protect from unauthorized disclosure such Confidential Information.

If the Town receives a request for a proposer's Confidential Information, it will promptly notify the proposer in writing of such request and provide the proposer with a copy of any written disclosure request. The proposer may provide written consent to the disclosure, or may object to the disclosure by notifying the Town in writing to withhold disclosure of the information, identifying in the notice the basis for its objection, including the statutory exemption(s) from disclosure. The proposer shall be responsible for defending any complaint brought in connection with the nondisclosure, including but not only appearing before the Freedom of Information Commission, and providing witnesses and documents as appropriate.

8. REQUIRED DISCLOSURES

Each proposer must, in its Required Disclosures Form, make the disclosures set forth in that form. A proposer's acceptability based on those disclosures lies solely in the Town's discretion.

9. REFERENCES

Each proposer must complete and submit the Proposer's Statement of References Form included in this RFP, see **Exhibit E**.

10. LEGAL STATUS

If a proposer is a corporation, limited liability company, or other business entity that is required to register with the Connecticut Secretary of the State's Office, it must have a current registration on file with that office. The Town may, in its sole discretion, request acceptable evidence of any proposer's legal status. Each proposer must complete the Proposer's Legal Status Disclosure Form included in this RFP, see **Exhibit C**.

11. PROPOSAL (BID) SECURITY

THIS ITEM IS NOT APPLICABLE TO THIS RFP

12. PRESUMPTION OF PROPOSER'S FULL KNOWLEDGE

Each proposer is responsible for having read and understood each document in this RFP and any addenda issued by the Town. A proposer's failure to have reviewed all information that is part of or applicable to this RFP, including but not only any addenda posted on the Town's website and/or CT DAS Contracting Portal, shall in no way relieve it from any aspect of its proposal or the obligations related thereto.

Each proposer is deemed to be familiar with and is required to comply with all federal, state and local laws, regulations, ordinances, codes and orders that in any manner relate to this RFP or the provision or goods or performance of the work described herein.

By submitting a proposal, each proposer represents that it has thoroughly examined and become familiar with the scope of work outlined/the goods described in this RFP, and it is capable of performing the work/delivering/installing the goods to achieve the Town's objectives. If applicable, each proposer shall visit the site, examine the areas and thoroughly familiarize itself with all conditions of the property before preparing its proposal.

13. SUBSTITUTION FOR NAME BRANDS

THIS ITEM IS NOT APPLICABLE TO THIS RFP

14. TAX EXEMPTIONS

The Town is exempt from the payment of federal excise taxes and Connecticut sales and use taxes. Exemption from State sales tax per Conn. Gen. Stat. Chapter 219, § 12-412(1).
Federal Tax Exempt number will be provided to the selected firm prior to execution of contract.

15. INSURANCE

The successful proposer shall, at its own expense and cost, obtain and keep in force at least the insurance listed in the Insurance Requirements that are a part of this RFP, as delineated in **Exhibit A**. The Town reserves the right to request from the successful proposer a complete, certified copy of each required insurance policy.

16. PERFORMANCE SECURITY

THIS ITEM IS NOT APPLICABLE TO THIS RFP

17. DELIVERY ARRANGEMENTS

THIS ITEM IS NOT APPLICABLE TO THIS RFP

18. AWARD CRITERIA; PRELIMINARY SELECTION; CONTRACT EXECUTION

All proposals will be publicly opened and read aloud as received on the date, at the time, and at the place identified in this RFP. Proposers may be present at the opening.

The Town reserves the right to correct, after proposer verification, any mistake in a proposal that is a clerical error, such as a price extension, decimal point error or FOB terms. If an error exists in an extension of prices, the unit price shall prevail. In the event of a discrepancy between the price quoted in words and in figures, the words shall control.

The Town reserves the rights to accept all or any part of a proposal, reject all proposals, and waive any informalities or non-material deficiencies in a proposal. The Town also reserves the right, if applicable, to award the purchase of individual items under this RFP to any combination of separate proposals or proposers.

The Town will select the lowest responsible proposer, meaning that, in addition to price, due consideration will be given to factors such as a proposer's experience, references, capabilities, past performance, and other relevant criteria.

The Town will not award the proposal to any business that or person who is in arrears or in default to the Town with regard to any tax, debt, contract, security or any other obligation.

The Town will issue a Preliminary Notice of Award. The preliminary notice of award may be subject to further negotiations with the proposer. **The making of a preliminary award to a proposer does not provide the proposer with any rights and does not impose upon the Town any obligations. The Town is free to withdraw a preliminary award at any time and for any reason. A proposer has rights, and the Town has obligations, only if and when a Contract is executed by the Town and the proposer.**

If the proposer does not provide all required documents and execute the Contract within ten (10) business days of the date of the Preliminary Notice of Award, unless extended by the Town, the Town may call any proposal security provided by the proposer and may enter into discussions with another proposer.

19. NONRESIDENT REAL PROPERTY CONTRACTORS

If the successful proposer is a "nonresident contractor" as defined in Conn. Gen. Stat. § 12-430(7)(A) as amended, it shall comply fully with the provisions of § 12-430(7) and, prior to execution of the Contract, shall furnish the Town with proof that it is a "verified contractor" within the meaning of General Statutes Section 12-430(7) or that it has posted a bond with the Commissioner of Revenue Services in compliance with General Statutes Section 12-430(7). The successful proposer agrees to defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), from any and all taxes, interest and penalties that the State of Connecticut asserts are due with respect to the successful proposer's activities under the Contract.

The successful proposer shall also be required to pay any and all attorney's fees incurred by the Town Indemnified Parties in enforcing any of the successful proposer's obligations under this section, whether or not a lawsuit or other proceeding is commenced, which obligations shall survive the termination or expiration of the Contract.

20. COMPLIANCE WITH IMMIGRATION LAWS

By submitting a proposal, each proposer confirms that it has complied, and during the term of the Contract will comply, with the Immigration Reform and Control Act ("IRCA") and that each person it provides under the Contract will at all times be authorized for employment in the United States of America. Each proposer confirms that it has a properly completed Employment Eligibility Verification, Form I-9, for each person who will be assigned under the Contract and that it will require each subcontractor, if any, to confirm that it has a properly completed Form I-9 for each person who will be assigned under the Contract.

The successful proposer shall defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), against any and all proceedings, suits, actions, claims, damages, injuries, awards, judgments, losses or expenses, including fines, penalties, punitive damages, attorney's fees and costs, brought or assessed against, or incurred by, the Town Indemnified Parties related to or arising from the obligations under IRCA imposed upon the successful proposer or its subcontractor. The successful proposer shall also be required to pay any and all attorney's fees and costs incurred by the Town Indemnified Parties in enforcing any of the successful proposer's obligations under this provision, whether or not a lawsuit or other proceeding is commenced. The successful proposer's obligations under this section shall survive the termination or expiration of the Contract.

21. NON COLLUSION AFFIDAVIT

Each proposer shall submit a completed Proposer's Non Collusion Affidavit Form that is part of this RFP, see **Exhibit D**.

22. CONTRACT TERMS

The following provisions will be mandatory terms of the Town's Contract with the successful proposer. If a proposer is unwilling or unable to meet, or seeks to clarify or modify, any of these Contract Terms, the proposer must disclose that inability, unwillingness, clarification and/or modification in its Proposal Form.

a. DEFENSE, HOLD HARMLESS AND INDEMNIFICATION

The successful proposer agrees, to the fullest extent permitted by law, to defend, indemnify, and hold harmless the Town, its employees, officers, officials, agents, volunteers and independent contractors, including any of the foregoing sued as individuals (collectively, the "Town Indemnified Parties"), from and against all proceedings, suits, actions, claims, damages, injuries, awards, judgments, losses or expenses, including attorney's fees, arising out of or relating, directly or indirectly, to the successful proposer's malfeasance, misconduct, negligence or failure to meet its obligations under the RFP or the Contract. The successful proposer's obligations under this section shall not be limited in any way by any limitation on the amount or type of the successful proposer's insurance.

Nothing in this section shall obligate the successful proposer to indemnify the Town or its Indemnified Parties against liability for damage arising out of bodily injury to persons or damage to property caused by or resulting from the negligence of the Town Indemnified Parties.

In any and all claims against the Town or its Indemnified Parties made or brought by any employee of the successful proposer, or anyone directly or indirectly employed or contracted with by the successful proposer, or anyone for whose acts or omissions the successful proposer is or may be liable, the successful proposer's obligations under this section shall not be limited by any limitation on the amount or type of damages, compensation or benefits payable by the successful proposer under workers' compensation acts, disability benefit acts, or other employee benefits acts.

The successful proposer shall also be required to pay any and all attorney's fees incurred by the Town or its Indemnified Parties in enforcing any of the successful proposer's obligations under this section. The successful proposer's obligations under this section shall survive the termination or expiration of the Contract.

As a municipal agency of the State of Connecticut, the Town will NOT defend, indemnify, or hold harmless the successful proposer.

b. ADVERTISING

The successful proposer shall not name the Town in its advertising, news releases, or promotional efforts without the Town's prior written approval.

If it chooses, the successful proposer may list the Town in a Statement of References or similar document required as part of its response to a public procurement. The Town's permission to the successful proposer to do so is not a statement about the quality of the successful proposer's work or the Town's endorsement of the successful proposer.

c. SUBCONTRACTING

Prior to entering into any subcontract agreement(s) for the work described in the Contract, the successful proposer shall provide the Town with written notice of the identity (full legal name, street address, mailing address (if different from street address), and telephone number) of each proposed subcontractor. The Town shall have the right to object to any proposed subcontractor by providing the successful proposer with written notice thereof within seven (7) business days of receipt of all required information about the proposed subcontractor. If the Town objects to a proposed subcontractor, the successful proposer shall not use that subcontractor for any portion of the work described in the Contract.

All permitted subcontracting shall be subject to the same terms and conditions as are applicable to the successful proposer. The successful proposer shall remain fully and solely liable and responsible to the Town for performance of the work described in the Contract. The successful proposer also agrees to promptly pay each of its subcontractors within thirty (30) days of receipt of payment from the Town or otherwise in accordance with law. The successful proposer shall assure compliance with all requirements of the Contract. The successful proposer shall also be fully and solely responsible to the Town for the acts and omissions of its subcontractors and of persons employed, whether directly or indirectly, by its subcontractor(s).

d. PREVAILING WAGES

THIS ITEM IS NOT APPLICABLE TO THIS RFP

e. PREFERENCES

The successful proposer shall comply with the requirements of Conn. Gen. Stat. § 31-52(b), as amended. Specifically, the successful proposer agrees that in the employment of labor to perform the work under the Contract, preference shall be given to citizens of the United States who are, and have been continuously for at least three (3) months prior to the date of the Contract, residents of the labor market area (as established by the State of Connecticut Labor Commissioner) in which such work is to be done, and if no such qualified person is available, then to citizens who have continuously resided in Hartford County for at least three (3) months prior to the date hereof, and then to citizens of the State who have continuously resided in the State at least three (3) months prior to the date of the Contract.

f. WORKERS COMPENSATION

Prior to Contract execution, the Town will require the tentative successful proposer to provide 1) evidence of compliance with the workers' compensation insurance and self-insurance requirements of subsection (b) of Connecticut General Statutes section 31-284,

and 2) a current statement from the State Treasurer that, to the best of her knowledge and belief, as of the date of the statement, the tentative successful proposer was not liable to the State for any workers' compensation payments made pursuant to Conn. Gen. Stat. § 31-355.

g. SAFETY

THIS ITEM IS NOT APPLICABLE TO THIS RFP

h. COMPLIANCE WITH LAWS

The successful proposer shall comply with all applicable laws, regulations, ordinances, codes and orders of the United States, the State of Connecticut and the Town related to its proposal and the performance of the Contract.

i. NONDISCRIMINATION AND AFFIRMATIVE ACTION

In the performance of the Contract, the successful proposer will not discriminate or permit discrimination in any manner prohibited by the laws of the United States or of the State of Connecticut against any person or group of persons on the grounds of race, color, religious creed, age (except minimum age), marital status or civil union status, national origin, ancestry, sex, sexual orientation, mental retardation, mental disability or physical disability, including but not limited to blindness, unless the successful proposer shows that such disability prevents performance of the work involved.

In the performance of the Contract, the successful proposer will take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age (except minimum age), marital status or civil union status, national origin, ancestry, sex, sexual orientation, mental retardation, mental disability or physical disability, including but not limited to blindness, unless the successful proposer shows that such disability prevents performance of the work involved.

Any violation of these provisions shall be considered a material violation of the Contract and shall be grounds for the Town's cancellation, termination or suspension, in whole or in part, of the Contract and may result in ineligibility for further Town contracts.

j. LICENSES AND PERMITS

The successful proposer certifies that, throughout the Contract term, it shall have and provide proof of all approvals, permits and licenses required by the Town and/or any state or federal authority. The successful proposer shall immediately and in writing notify the Town of the loss or suspension of any such approval, permit or license.

k. CESSATION OF BUSINESS/BANKRUPTCY/RECEIVERSHIP

If the successful proposer ceases to exist, dissolves as a business entity, ceases to operate, files a petition or proceeding under any bankruptcy or insolvency laws or has such a petition or proceeding filed against it, the Town has the right to terminate the Contract

effective immediately. In that event, the Town reserves the right, in its sole discretion as it deems appropriate and without prior notice to the successful proposer, to make arrangements with another person or business entity to provide the services described in the Contract and to exercise any or all of its rights at Law, in equity, and/or under the Contract.

l. AMENDMENTS

The Contract may not be altered or amended except by the written agreement of both parties.

m. ENTIRE AGREEMENT

It is expressly understood and agreed that the Contract contains the entire agreement between the parties, and that the parties are not, and shall not be, bound by any stipulations, representations, agreements or promises, oral or otherwise, not printed or inserted in the Contract or its attached exhibits.

n. VALIDITY

The invalidity of one or more of the phrases, sentences or clauses contained in the Contract shall not affect the remaining portions so long as the material purposes of the Contract can be determined and effectuated.

o. CONNECTICUT LAW AND COURTS

The Contract shall be governed by and construed in accordance with the internal laws (as opposed to the conflicts of law provisions) of the State of Connecticut, and the parties irrevocably submit in any suit, action or proceeding arising out of the Contract to the jurisdiction of the United States District Court for the District of Connecticut or of any court of the State of Connecticut, as applicable.

p. NON-EMPLOYMENT RELATIONSHIP

The Town and the successful proposer are independent parties. Nothing contained in the Contract shall create, or be construed or deemed as creating, the relationships of principal and agent, partnership, joint venture, employer and employee, and/or any relationship other than that of independent parties contracting with each other solely for the purpose of carrying out the terms and conditions of the Contract. The successful proposer understands and agrees that it is not entitled to employee benefits, including but not limited to worker's compensation and employment insurance coverage, and disability. The successful proposer shall be solely responsible for any applicable taxes.

END OF STANDARD INSTRUCTIONS TO PROPOSERS

EXHIBIT A

STONINGTON PUBLIC SCHOOLS
STONINGTON, CONNECTICUT

REQUEST FOR PROPOSALS FOR
THIRD PARTY INDEPENDENT STRUCTURAL REVIEW RFP: #2016-012

INSURANCE REQUIREMENTS

The Successful Proposer shall agree to maintain in force at all times during which services are to be performed the following coverages placed with company(ies) licensed by the State of Connecticut that have at least an "A-" VIII policyholders rating according to Best Publication's latest edition Key Rating Guide.

		(Minimum Limits)
General Liability*	Each Occurrence	$1,000,000
	General Aggregate	$3,000,000
	Products/Completed Operations Aggregate	$3,000,000
	Personal and ADV Injury	$1,000,000
	Damage to Rented Premises	$300,000
	Medical Expense (anyone person)	$10,000
Auto Liability*	Combined Single Limit	
	Each Accident	$1,000,000
Professional Liability	Each Claim or Each Occurrence	$1,000,000
	Aggregate	$1,000,000
Umbrella*	Each Occurrence	$5,000,000
(Excess Liability)	Aggregate	$5,000,000
* "Town of Stonington	shall be named as "Additional Insured"	Coverage is to be provided on a primary, noncontributory basis.

If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of the contract. If the policy is replaced and/or the retroactive date is changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

Workers' Compensation and Employers' Liability	WC Statutory Limits	
	EL Each Accident	$500,000
	EL Disease Each Employee	$500,000
	EL Disease Policy Limit	$500,000

Original, completed Certificates of Insurance must be presented to the Town prior to contract issuance. The Successful Proposer agrees to provide replacement/renewal certificates at least 60 days prior to the

expiration of any policy. Should any of the above described policies be cancelled before the expiration date, written notice must be given to the Town 30 days prior to cancellation.

INSURANCE REQUIREMENTS FOR SUBCONTRACTORS

The Contractor shall ensure that all tiers of their subcontractors shall procure and maintain insurance in like form and amounts including the Additional Insured requirements, as set forth above. Copies of the certificates of insurance must be provided to the Town prior to the subcontractor entering the jobsite.

Third Party Independent Structural Review Proposal Form

DEANS MILL ELEMENTARY SCHOOL (S.P.N. 137-0047)

Firm:

Address:

Telephone:

Fax:

Contact Person:

Date:

a) Fee for Third Party Structural Review

_____, proposes to provide third party structural review services as described in the Request for Proposal for Independent Third Party Structural Review dated October 12, 2016, for the fixed lump sum fee of:

Fixed Fee for Third Party Structural Review $_____

_____
(Written Amount)

Hourly Rate for Additional Services (if required): $_____/hr

Signed: _____ Date:_____

(Person Authorized to Act on behalf of the Firm)

Third Party Independent Structural Review Proposal Form

WEST VINE STREET ELEMENTARY SCHOOL (S.P.N. 137-0047)

Firm:

Address:

Telephone:

Fax:

Contact Person:

Date:

b) Fee for Third Party Structural Review

_____, proposes to provide third party structural review services as described in the Request for Proposal for Independent Third Party Structural Review dated October 12, 2016, for the fixed lump sum fee of:

Fixed Fee for Third Party Structural Review $_____

_____
(Written Amount)

Hourly Rate for Additional Services (if required): $_____/hr

Signed: _____ Date:_____

(Person Authorized to Act on behalf of the Firm)

EXHIBIT C

STONINGTON PUBLIC SCHOOLS
STONINGTON, CONNECTICUT

REQUEST FOR PROPOSALS FOR
THIRD PARTY INDEPENDENT STRUCTURAL REVIEW – RFP: #2016-012

PROPOSER'S LEGAL STATUS DISCLOSURE

Please fully complete the applicable section below, attaching a separate sheet if you need additional space.

For purposes of this disclosure, "permanent place of business" means an office continuously maintained, occupied and used by the proposer's regular employees regularly in attendance to carry on the proposer's business in the proposer's own name. An office maintained, occupied and used by a proposer only for the duration of a contract will not be considered a permanent place of business. An office maintained, occupied and used by a person affiliated with a proposer will not be considered a permanent place of business of the proposer.

IF A SOLELY OWNED BUSINESS:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address) _____

Owner's Full Legal Name _____

Number of years engaged in business under sole proprietor or trade name _____

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

_____Yes _____No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

_____

IF A CORPORATION:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address) _____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Officers

_____	_____	_____
President	Secretary	Chief Financial Officer

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

_____Yes _____No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

_____

IF A LIMITED LIABILITY COMPANY:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address)_____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Manager(s) and Member(s)

_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

_____Yes _____No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

_____

IF A PARTNERSHIP:

Proposer's Full Legal Name _____

Street Address _____

Mailing Address (if different from Street Address) _____

Owner's Full Legal Name _____

Number of years engaged in business _____

Names of Current Partners

_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)
_____	_____
Name & Title (if any)	Residential Address (street only)

Does the proposer have a "permanent place of business" in Connecticut, as defined above?

_____Yes _____No

If yes, please state the full street address (not a post office box) of that "permanent place of business."

_____

_____
Proposer's Full Legal Name

_____
(print)
Name and Title of Proposer's Authorized Representative

_____
(signature)
Proposer's Representative, Duly Authorized

_____
Date

END OF LEGAL STATUS DISCLOSURE FORM

EXHIBIT D

STONINGTON PUBLIC SCHOOLS
STONINGTON, CONNECTICUT

REQUEST FOR PROPOSALS FOR
THIRD PARTY INDEPENDENT STRUCTURAL REVIEW – RFP: #2016-012

PROPOSER'S NON COLLUSION AFFIDAVIT FORM

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

(1) the proposal is genuine; it is not a collusive or sham proposal;

(2) the proposer developed the proposal independently and submitted it without collusion with, and without any agreement, understanding, communication or planned common course of action with, any other person or entity designed to limit independent competition;

(3) the proposer, its employees and agents have not communicated the contents of the proposal to any person not an employee or agent of the proposer and will not communicate the proposal to any such person prior to the official opening of the proposal; and

(4) no elected or appointed official or other officer or employee of the Town of Stonington is directly or indirectly interested in the proposer's proposal, or in the supplies, materials, equipment, work or labor to which it relates, or in any of the profits thereof.

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

_____ _____
Legal Name of Proposer (signature)
Proposer's Representative, Duly Authorized

_____
Name of Proposer's Authorized Representative

_____
Title of Proposer's Authorized Representative

_____
Date

Subscribed and sworn to before me this_____day of_____, 201 .

_____
Notary Public
My Commission Expires:

END OF NON COLLUSION AFFIDAVIT FORM

EXHIBIT E

STONINGTON PUBLIC SCHOOLS
STONINGTON, CONNECTICUT

REQUEST FOR PROPOSALS FOR
THIRD PARTY INDEPENDENT STRUCTURAL REVIEW – RFP: #2016-012

PROPOSER'S STATEMENT OF REFERENCES FORM

Provide at least three (3) references:

BUSINESS NAME _____

ADDRESS _____

CITY, STATE _____

TELEPHONE: _____

INDIVIDUAL CONTACT NAME AND POSITION _____

_____

BUSINESS NAME _____

ADDRESS _____

CITY, STATE _____

TELEPHONE: _____

INDIVIDUAL CONTACT NAME AND POSITION _____

_____

BUSINESS NAME _____

ADDRESS _____

CITY, STATE _____

TELEPHONE: _____

INDIVIDUAL CONTACT NAME AND POSITION _____

_____

END OF STATEMENT OF REFERENCES FORM

4. Arbitration/Litigation

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

_____Yes
_____No

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

5. Criminal Proceedings

Has the proposer or any of its principals (current or former, regardless of place of employment) ever been the subject of any criminal proceedings?

_____Yes
_____No

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

6. Ethics and Offenses in Public Projects or Contracts

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

_____Yes
_____No

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

7. Federal Debarment List

Is the proposer on the Federal Government's Debarment List?

_____Yes
_____No

END OF REQUIRED DISCLOSURES FORM

EXHIBIT F

REQUIRED DISCLOSURES

1. Exceptions to/Clarifications of/Modifications of the RFP

_____This proposal does not take exception to or seek to clarify or modify any requirement of the RFP, including but not only any of the Contract Terms set forth in the Standard Instructions to Proposers. **The proposer agrees to each and every requirement, term, provision and condition of this RFP**.

OR

_____ This proposal takes exception(s) to and/or seeks to clarify or modify certain of the RFP requirements, including but not only the following Contract Terms set forth in the Standard Instructions to Proposers. **Attached is a sheet fully describing each such exception.**

2. State Debarment List

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

_____Yes
_____No

3. Occupational Safety and Health Law Violations

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

_____Yes
_____No

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

Stonington K-12 Modernization Project
Addition to Deans Mill School
35 Deans Mill Road
Stonington, Connecticut

Report on Geotechnical Engineering Investigation

August 25, 2016

Prepared By:
GNCB Consulting Engineers, P.C.
Old Saybrook, Connecticut

Prepared For:
Town of Stonington
Stonington, Connecticut

GNCB
Consulting Engineers, P.C.

Structural Engineering
Geotechnical Engineering
Historic Preservation
Construction Support

August 25, 2016

Town of Stonington
152 Elm Street
Stonington, Connecticut 06378

Principals
Kenneth Gibble, P.E.
James F. Norden, P.E.
Charles C. Brown, P.E.

Geotechnical Associate
David L. Freed, P.E.

Structural Associate
Richard A. Centola, P.E.

Attention: Mr. James Sullivan, Director of Finance

Re: Report on Geotechnical Engineering Investigation
Stonington K-12 Modernization Project
Addition to Deans Mill School
35 Deans Mill Road, Stonington, Connecticut

Dear Mr. Sullivan:

We are transmitting to you two (2) hard copies of our geotechnical engineering report that summarizes the results of test borings and foundation design recommendations for the Addition to Deans Mill School in Stonington, Connecticut. An electronic copy of the report is also being transmitted to your project representative, Mr. Charles Warrington of Colliers International and to your architect, Mr. Anwar Hossain of Drummey Rosane Anderson, Inc. Our work was undertaken in accordance with your authorized contract agreement dated April 15, 2016.

In summary, the results of 16 test borings (refer to Drawing 2 for locations) indicate that subsurface conditions within the building addition typically consists of a thin surface topsoil, man-placed fill and subsoil, underlain by a thick deposit of glacial till that typically consists of a gray silty medium to fine SAND with gravel and silt. Groundwater, at the building addition, is typically over 15 ft. below the new ground floor slab and does not appear to be a site factor. We recommend that the proposed building addition be supported on conventional spread footing foundations with a slab-on-grade concrete ground floor bearing on the naturally-deposited glacial till or on compacted structural fill placed on the

130 Elm Street
P.O. Box 802
Old Saybrook, CT 06475
Tel 860.388.1224
Fax 860.388.4613
lastname@gncbengineers.com
gncbengineers.com

GNCB
Consulting Engineers, P.C.

suitable bearing materials after removing the surface topsoil and/or fill. The subsoil may remain in place below the building foundations, provided it is removed to a depth at least 18 in. below the slab and/or footings.

We appreciate the opportunity to work with you on this aspect of the project. If you have any questions, or need additional information, please call.

Sincerely yours,

David L. Freed, PE
Geotechnical Associate

GNCB
Consulting Engineers, P.C.

Table of Contents

I. PURPOSE AND SCOPE:

The purpose of this study was to investigate soil, rock and groundwater conditions at the site, and to develop geotechnical engineering recommendations for construction of a building addition and associated site work to Deans Mill School in Stonington, Connecticut. Comments on geotechnical engineering aspects of site development and construction are also provided.

To achieve these objectives, GNCB Consulting Engineers, P.C. (GNCB) completed the following scope of work:

- Developed and monitored a program of 16 test borings (B-1 to B-16) and two core holes (C-1 and C-2) to investigate the existing pavement cross section.

- Conducted engineering analyses for final design regarding building foundations, including soil bearing capacity, settlement, seismic requirements, and other aspects of project site design, such as retaining walls and pavement design.

- Prepared an engineering report that summarizes the work completed.

During our investigation, GNCB worked in association with the following design team members:

Owner's Rep:	Colliers International, Stratford, Connecticut
Architect:	Drummey Rosane Anderson, Inc. South Windsor, Connecticut
Structural Engineer:	Szewaczak Associates, Avon, Connecticut
Civil Engineer:	Milone & MacBroom, Cheshire, Connecticut

II. SITE LOCATION AND SURFACE CONDITIONS:

The approximately 14-acre elementary school complex, is located on the south side of Deans Mill Road, approximately 900 ft. west from its intersection with Flanders Road, in Stonington, Connecticut, as approximately shown on Drawing 1, "Project Locus." The existing school, located along Deans Mill Road, is comprised of two rectangular-shaped buildings; a west two-story structure built in 1967 and an east one-story structure built in 1973; an enclosed passageway connects the buildings. Children's paved and dirt playground areas exist south of the existing west building. An open grass area with a circular track exists east of the playground areas, while dense wooded areas exist to the west of the school buildings.

Ground surface within the area south of the existing school buildings (i.e. area of the building addition), slopes downward from about El. 90 at the northwest corner to El. 80 at the southeast corner. Ground surface continues to drop towards the east to about El. 70 and rises (within the wooded area to the west) to about El. 120. (Note: Elevations are in feet and refer to NAVD 88 Datum). We understand that a majority of the off-site utilities (i.e. electric, gas, communications) enter the site from the street.

The existing site topography, as well as locations of site features/utilities, is shown on a March 11, 2016 "Boring Location Plan", Drawing No. B-1, prepared by and included with the RFP for geotechnical services. This map has been used as a base plan for the attached Drawing 2, "Test Boring Plan."

III. PROPOSED CONSTRUCTION:

The significant new building addition and site construction is shown on Schematic Design Drawings (dated March 11, 2016) that we received at the time we submitted a proposal for work and on a preliminary Site Grading Plan (dated April 1, 2016) prepared by Milone & MacBroom. The new construction includes the following:

- Of the 2 existing school buildings, the east structure and passageway will be demolished.
- A new 2-story rectangular building addition, to include classrooms, gym, and cafeteria, that abuts the south side of the existing west building.
- A paved bus drop area west of the combined new school buildings.
- A large rectangular shaped paved parking area east of the combined new school building complex.
- A new water detention area at the extreme east end of the property.

The building addition will have a total footprint of about 25,500 sq. ft. within a rectangular area of about 255 ft. (north-south) by 120 ft. (east-west). The ground floor level for the building addition will match existing building floor at El. 89.2. At the southeast corner of the building addition, this finish floor grade is as much as 9 ft. above existing site grade. The addition will be of masonry wall construction with perimeter and interior column support. We understand that the addition will have clear spans up to about 65 ft., however column spacing will typically be about 25 to 30 ft. We have received a schematic foundation layout plan from the structural engineer; we understand from this plan that the new building dead plus live column loads will be in the range of 200 kips, or less and 3 to 5 kips per lin. ft. along the building perimeter walls.

The large east parking area will require a raise in grade of about 10 to 12 ft. A water retention area, along the east property line, will be largely a cut in grade. As shown on the preliminary site grading, the approximately 26 ft. grade change from the school building to the water retention area will be accomplished by sloped open grades. The west bus drop area will require a cut in grade up to about 15 ft.

Details of the proposed construction, as reported herein, is shown on the attached Drawing 2, “Test Boring Plan.” The areas of new pavement have been shown, as well as proposed finish grading.

IV. SUBSURFACE INVESTIGATIONS:

A. Test Borings

We are not aware of any previous test borings completed within the areas of new construction. However, we have received the results of several test pits recently excavated by Milone & MacBroom for their civil studies; the test pits are located on the attached Drawing 2.

For current building and site design, GNCB concurred with the recommended program of 14 test borings (B-1 to B-14), prepared by others; GNCB added 2 additional borings (B-15 and B-16) at the proposed building addition. These explorations were drilled during the period April 18 and 19, 2016 at the approximate locations shown on Drawing 2. GNCB monitored the field work and prior to the work located explorations in the field by taping from existing site features shown on the base plan. However, the project civil engineer located the as-drilled test borings and determined ground surface elevations by instrument survey after the work was completed. The attached Table I summarizes the soil conditions encountered at each test boring; detailed soil descriptions are contained in the following report section. Logs of the test borings, prepared by the contractor and reviewed by GNCB, are included as Appendix A.

General Borings, Inc. of Prospect, Connecticut, under contract to GNCB, drilled the test borings using either a standard Model B-53 truck rig or a special drill rig mounted on a rubber-tired backhoe to advance 3-1/4 inside diameter hollow stem augers (HSAs). Near continuous soil samples (ASTM D 1586) were obtained within the upper 7 ft. The test borings, which ranged in depth from 7.5 to 20.9 ft., all terminated within naturally-deposited glacial till, except for B-9 which terminated within existing fill. Many of the test borings terminated at refusal, which we believe were boulders within the deposit.

B. Pavement Cores and Grain Size Analysis Tests

In addition to the above noted test borings, the existing pavement and underlying material within about 4 ft. of grade was examined at two core locations, C-1 and C-2. Logs of the soils encountered were also prepared by the contractor; GNCB prepared a graphical vertical plot of the test boring results as shown on the attached Drawing 3, "Summary of Pavement Cores." In addition, recovered test boring samples were submitted to a laboratory, Angus McDonald Gary Sharpe Associates, for gradation testing by ASTM D422. The results of four washed grain size analysis tests are included as Appendix B.

V. SUBSURFACE AND GROUNDWATER CONDITIONS:

A. Subsurface Conditions

The subsurface explorations indicated at least three near surface subsurface soil strata (organic soil/asphalt, man-placed fill and subsoil) underlain by a significant depth of glacial till. The subsurface strata encountered in the subsurface explorations are described below, progressing downward from ground surface:

Asphalt, Topsoil, and Forest Mat: The site is blanketed by a thin surface organic soil, either topsoil (open area) or a forest mat (wooded areas) or asphalt pavement. The organic soils, which typically consist of a dark brown loamy fine SAND, with various root matter, is typically 0.3 to 0.5 ft. thick but is as much as 1 ft. in wooded areas. The asphalt is typically 3 to 4 in. thick.

Man-Placed Fill: At a few random locations, a man-placed fill directly underlies the surface materials. The fill, which we suspect is due to previous site grading, is generally a brown to tan medium dense medium to fine SAND, little silt and gravel. The fill where encountered is typically

1.5 to 2.5 ft. thick, but was as much as 5 ft. to at least 7.5 ft. (at B-14 and B-9 respectively) within the east grass area of the site. B-9 terminated within the fill.

Subsoil: The forest mat within wooded areas and the topsoil/pavement and fill at open areas was underlain by subsoil that was typically 1 to 3 ft. thick. The subsoil generally consists of a yellow brown fine sandy SILT to silty fine SAND. At some areas, however, the subsoil does not exist, such as within the north end of the building addition; we suspect that previous site grading removed this material.

The combined thickness of surface organic soils/asphalt materials, man-placed fill, and subsoil is typically from 1.5 to 3.5 ft. in thickness.

Glacial Till: The dominant soil type at the site is a thick deposit of glacial till, which is typically a heterogeneous mixture of sand, gravel and silt. The till at this site typically consist of a brown to tan coarse to fine SAND, little gravel, trace to little silt grading to a sandy GRAVEL, little silt. The till is typically over 10 ft. thick, but was as much as 18.4 ft. thick at B-13. Except for B-9 which terminated in the man-placed fill, all the test borings terminated within the glacial till. The elevation top of the glacial till (and for the subsoil described above) are tabulated for each test boring on Table I.

Bedrock: The test borings did not encounter bedrock. Based on observed outcroppings and mapping completed by others, bedrock at the site is believed to be a sound gray hornblende-biotite GNEISS. Metamorphic layering is typically dipping moderately to the north.

B. Groundwater Conditions

A number of the test borings encountered groundwater; the observed water levels are summarized on Table I. These water levels, however,

were made at the completion of the test borings and sufficient time may not have elapsed for the water to stabilize to its static level. Within the building addition, water was observed within the test borings between El. 73 and El. 78. In any event, water levels vary with precipitation, season, and other factors. As a result, water levels encountered during and after construction may differ from those observed in the test borings.

VI. FOUNDATION AND SITE DESIGN CRITERIA:

A. Building Foundations and Ground Floor Slab

In our opinion, surface topsoil, asphalt, and man-placed fill are not suitable to support the building frame or ground floor slab. The glacial till deposit is a suitable bearing material. In view of the anticipated 2 to 8 ft. raise in grade to finish floor grade, and depth of the subsoil below the building footings and/or slab, the subsoil is a suitable bearing material, provided it is covered with a minimum 18 in. thickness of compacted structural fill. We recommend that within the building addition, and to the proper lateral limits, that the unsuitable materials (topsoil, asphalt, man-placed fill, and subsoil within 18 in. of the bottom of footing and/or slab) be removed, and be replaced with compacted (off-site) structural fill. Accordingly, we recommend that the building walls and columns be supported on reinforced concrete spread footings bearing on the naturally-deposited glacial till deposit or on compacted structural fill placed on the suitable bearing soils.

Drawing 2 shows contours of the top of suitable bearing material (glacial till and/or subsoil), as interpolated from the test borings. These contours gradually slope down from west to east ranging from El. 86 to El. 82. Accordingly, we anticipate that nearly all of the foundation footings will be bearing within compacted structural fill.

Based on current design information, we recommend the following criteria for foundation design:

1. Design in accordance with the current State of Connecticut Building Code.
2. For frost protection, locate bottoms of footings at least 3.5 ft. below exterior ground surface exposed to freezing.
3. Proportion footings for a net allowable soil bearing pressure equal to 1.7 times the least footing dimension as measured in feet, up to a maximum of 5 kips per sq. ft. (ksf). The minimum footing width shall be 18 in.
4. The design allowable soil bearing pressure may be increased by 1/3 for transient loads.
5. Where compacted structural fill is used to support building footings and slabs, carry the foundation preparation and new fill to lateral limits extending a distance beyond the edge of the footing equal to the depth of fill below footing plus two feet, as shown on Drawing 4, “Limits of Compacted Structural Fill Below Footings.”
6. We expect that total footing settlement will range from ½ to ¾ in. Footing settlement is expected to occur as the load is applied. We do not expect that differential settlement between footings will exceed ½ in., for footings typically spaced about 30 ft. apart.
7. Remove all topsoil, asphalt, man-placed fill, and subsoil within 18 in. of the bottom of footing and/or slab foundations, from the building limits, and to the lateral limits required for placement of compacted structural fill. Prior to placing any structural fill within the building, recompact the prepared subgrade with at least 6 passes of a vibratory roller that weighs at least 10 tons. Replace any soils that are visually unstable with compacted structural fill.

Provide a minimum 12 in. thickness of compacted structural fill below building ground floor slabs.

B. Foundation Drainage

Due to the over 10 ft. depth of the groundwater below the building slab, and lack of a basement area, we do not recommend a perimeter foundation or underslab drainage system at the building addition.

C. Lateral Earth Pressures

The building design does not include below grade foundation walls which require retaining of soil. We can provide design lateral earth pressure criteria if basement walls are needed.

D. Seismic Criteria

Based on the test boring information, we recommend a site soil classification of Class C for seismic design. The mapped MCE spectral response acceleration values for Stonington, Connecticut are S_1=0.057 for one second period and S_s = 0.208 or short period. The natural inorganic glacial till, subsoil, or compacted structural fill to be placed are all not susceptible to liquefaction.

E. Compacted Fills

a. Compacted Structural Fill

Fill for use as compacted structural fill within the building footprint, both below the footings and ground floor slab, should consist of sandy gravel or gravelly sand, free of organic material, snow, ice or other unsuitable materials, and should be well graded within the following limits:

Sieve Size	Percent Finer By Weight
4 in.	100
No. 4	20 - 80
No. 40	5 - 50
No. 200	0 – 10

Compacted structural fill should be placed in horizontal layers having a maximum loose lift thickness of 10 in. (open areas) or 6 in. (confined areas). Each layer should be compacted to a dry density at least 95 percent of the maximum dry density as determined in accordance with ASTM Test Designation D1557.

The existing on-site soils are not suitable for use as compacted structural fill. Appendix C includes recommended technical provisions of specifications for compacted structural fill to be placed within building limits.

b. Compacted Common Fill

Beyond the limits of compacted structural fill placed for structures, compacted common fill may be used for site grading within paved and landscape areas. The requirements for compacted structural fill shall apply for common fill, with the following exceptions:

- The maximum stone size shall be 8 in.
- The range of percent passing the No. 200 sieve shall be 0 to 25 percent.
- The fill may be placed in maximum loose lifts of 12 in., when compacted by heavy equipment.
- Fill should be systematically compacted to a dry density that is at least 93 percent of the maximum dry density as determined in accordance with ASTM D1557.

- With regard to subgrade preparation for common fill areas, the surface topsoil and organic soil should be removed prior to placing common fill, however the existing man-placed fill and/or subsoil may be left in place. The subgrade should be recompacted per the requirements for compacted structural fill.
- We anticipated a majority of the on-site non-organic soils to be excavated will be suitable for use as common fill, however their successful placement and compaction will be difficult due to their high silt content and susceptibility to remain saturated.

F. Site Perimeter Slopes and Retaining Walls

We anticipate that site design to accommodate and meet the higher grades to the west of the building addition, and the lower "built up" grades east of the building addition, can be satisfied with open slope grading. There is almost a 25 ft. grade change east of the building addition.

We recommend that soil cut slopes to the west of the building addition be no steeper than 2 hor: 1 ver. Furthermore, the slopes within the existing man-placed fill and new built up slopes east of the building addition be no steeper than 2.5 hor: 1 ver. All these slopes may be covered with a loam and seed. We do not anticipate that toe drains will be needed at the base of slopes.

We are not aware of any new retaining walls. If needed, we suggest the following wall types be considered:

- Conventional reinforced concrete.
- Segmented modular blocks (such as Versa-Lok) with horizontal reinforced geogrids.
- Dry laid stone walls.

Walls should be designed for static cantilever soil loads. In addition, the backside of the walls should be lined with a pervious free draining material; the gradation for compacted structural fill contained herein is appropriate except the maximum percent finer by weight should not exceed 8 percent. We can provide specific design criteria if needed.

G. Paved Areas

As indicated previously, new paved parking areas for vehicle and heavy bus traffic are planned both west and east of the new building addition.

At the Buss Drop-Off and new paved parking area west of the building addition, new paved areas will require a cut in grade. We anticipate that subgrade areas will consist of the dense glacial till. New common fill will be needed within the new paved parking areas east of the building addition. In our opinion, the existing till and new fill are suitable for support of pavement design section. We suggest that the prepared subgrades be proof rolled by at least 4 passes of a fully loaded dump truck. Any visually soft areas should be removed and replaced with compacted structural fill. Subgrades should be sloped with a minimum1/2 percent slope to provide drainage.

We recommend the following pavement design section for vehicle and heavy truck traffic areas:

	Recommended Thickness (in.)	
	Vehicle Areas	Heavy Traffic
Bituminous Concrete (2 lifts)	3.0	4.5
Processed Stone (CTDOT Form 816/Sec M.05.01)	6.0	8.0
GravelBase (CTDOT Form 816/Sec M.02.06 Grading A)	10.0	12.0

Provide an additional 8 in. of Gravel Base within the east parking area

where new fill will be placed.

VII. CONSTRUCTION CONSIDERATIONS:

A. General

This report section provides comments related to foundation construction, earthwork, and other geotechnical aspects of the project. It will aid those responsible for preparation of contract plans and specifications and those involved with construction monitoring. The contractor must evaluate potential construction problems on the basis of their own knowledge and experience in the area and on the basis of similar projects in other localities, taking into account their own proposed construction equipment and procedures.

B. Excavation

Minimal excavation will be required within the new building addition, to remove unsuitable bearing materials. The largest anticipated depth of excavation exists at the west cut area within the bus drop area, where a 15 ft. cut in grade is anticipated. Based on the test borings, it appears that the majority of excavated soils will consist of topsoil, and existing man-placed fill within the building addition, and the glacial till within the west cut area. We expect that normal construction equipment will be adequate for soil removal. Excavation geometry should conform to OSHA excavation regulations contained in 29 CFR Part 1926 dated October 31, 1989. Temporary slopes of 1.5 hor: 1 ver should be stable.

Excavation should not be made below a 2 hor:1 ver line drawn from the outside bottom of an existing footing that remains, such as along the south side of the building to remain. Excavation made below this line may require underpinning of the existing foundation that remains.

C. Dewatering

We do not anticipate that groundwater will be a site issue. In addition, we expect that the site will drain water easily. Any rainwater which accumulates within excavations should be removed by open sump pumping.

D. Preparation of Bearing Surfaces

Following footing excavation, we recommend that the soil bearing surfaces be recompacted with hand-guided vibratory equipment prior to forming and concreting. Due to the potential for the soil subgrades to become disturbed or damaged due to rainfall or workmen, we suggest that prepared footing bearing surfaces that are not concreted within 24 hours be protected with a lean concrete mud mat or thin 3 in. layer of fine crushed stone. The geotechnical engineer may waive the requirement for recompacting footing bearing surfaces in the event that groundwater levels may be in close proximity to the exposed surface.

E. Construction Monitoring

The recommendations contained in this report are based on the known and predictable behavior of properly engineered and constructed foundations and other facilities. During construction, it will be necessary that experienced personnel be engaged to observe the excavation of unsuitable materials, placement of compacted structural/common fill, and preparation of footing and slab bearing surfaces. As part of GNCB contracted work, we plan to visit the site several times during foundation excavation to observe prepared bearing surfaces.

VIII. LIMITATIONS OF RECOMMENDATIONS:

This report has been prepared for specific application to the Addition to Deans Mill School project in Stonington, Connecticut, in accordance with generally

accepted geotechnical engineering practice. No other warranty, express of implied, is made. In the event that different subsurface soil conditions are encountered during construction, the conclusions and recommendations contained in the report must be reviewed for continued applicability to the project, and verification be documented in writing.

The analyses and recommendations in this report are based in part upon data obtained from the referenced test borings. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the preliminary recommendations contained herein.

As part of our contracted scope of work, GNCB plans to review the structural foundation drawings and site drawings and specifications to confirm that our geotechnical engineering recommendations have been followed.

GNCB
Consulting Engineers, P.C.

Tables

Table I – Summary of Test Borings

GNCB
Consulting Engineers, P.C.

TABLE I

SUMMARY OF TEST BORINGS

STONINGTON K-12 MODERNIZATION PROJECT
35 DEANS MILL ROAD SCHOOL
STONINGTON, CONNECTICUT

TEST BORING NO.	TOTAL DEPTH (FT.)	GROUND SURFACE ELEV. (FT.)	ELEV. WATER (FT.)	THICKNESS STRATA (FT.)					ELEVATION TOP (FT.)		
				FOREST MAT (FM) TOPSOIL (T) ASPHALT(A)	MAN-PLACED FILL	SUBSOIL	GLACIAL TILL	ROCK	SUBSOIL	GLACIAL TILL	ROCK
B-1(R)	13.0	84.4	74.0	0.3(T)	3.7	-	9.0+	-	NE	80.4	-
B-2 (R)	18.5	84.0	76.0	0.3(A)	2.4	-	15.8+	-	NE	81.3	-
B-3	16.3	83.7	74.2	0.3(A)	1.7	1.0	13.3+	-	81.7	80.7	-
B-4(R)	15.1	82.9	72.9	-	1.5	2.0	11.6+	-	81.4	79.4	-
B-5(R)	15.0	82.8	72.8	0.7(T)	-	2.8	11.5+	-	82.1	79.3	-
B-6(R)	18.0	85.5	73.0	0.8(T)	-	3.2	14.0+	-	84.7	81.5	-
B-7(R)	15.0	84.6	74.6	0.4(A)	-	2.1	12.5+	-	84.2	82.1	-
B-8	15.8	87.5	78.0	0.6(T)	-	1.9	13.3+	-	86.9	85.0	-
B-9(R)	7.5	71.0	DRY	-	7.5+	-	-	-	-	Below 63.5	-
B-10(R)	10.4	92.4	DRY	0.7(FM)	-	2.3	7.4+	-	91.7	89.4	-
B-11(R)	12.0	99.2	DRY	1.0(FM)	-	1.5	9.5+	-	98.2	96.7	-
B-12	20.0	105.4	NOT DETERMINED	0.8(FM)	-	1.7	17.5+	-	104.6	102.9	-
B-13	20.9	100.1	DRY	0.6(FM)	-	1.9	18.4+	-	99.5	97.6	-
B-14(R)	10.0	76.7	DRY	-	5.0	-	5.0+	-	-	71.7	-
B-15	8.3	87.2	DRY	0.5(T)		2.0	5.8+	-	86.7	84.7	-
B-16	6.8	85.3	DRY	0.4(A)	1.6	-	4.8+	-	-	83.3	-
C-1	3.5	91.2	DRY	0.4(A)	0.8	-	2.3+	-	-	90.0	-
C-2	5.5	73.9	DRY	0.25(A)	1.2	-	4.0+	-	-	72.4	-

(R) – Test boring refusal
(C) – Cored bedrock

NOTES:
1. Refer to Drawing 2 for locations of test borings.
2. Elevations are in feet and refer to NAVD 1988 Datum.

GNCB
Consulting Engineers, P.C.

Drawings

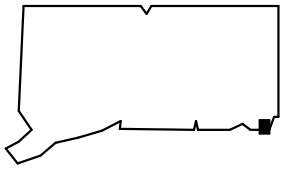
1- Project Locus
2- Test Boring Plan
3- Summary of Pavement Cores
4- Limits of Compacted Structural Fill Below Footings

N

W E

S

SITE COORDINATES: 41° 21' 41"N 71° 55' 28"W



U.S.G.S QUADRANGLE: MYSTIC, CT

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DEANS MILL SCHOOL
35 DEANS MILL ROAD, STONINGTON, CT
PROJECT LOCUS

1" = 2,000 FT.

MAY 2016

LEGEND

B-1	LOCATION AND GROUND SURFACE ELEVATION OF TEST BORINGS DRILLED BY GENERAL BORINGS, INC. OF PROSPECT, CT DURING THE PERIOD APRIL 18-20, 2016.
TP-1	LOCATION AND GROUND SURFACE ELEVATION OF TEST PITS EXCAVATED UNDER THE DIRECTION OF MILONE & MACBROOM, CHESHIRE, CT
85.2	EXISTING GROUND SURFACE ELEVATIONS SHOWN ON BASE PLAN
84	EXISTING SPOT GRADE ELEVATION
84	PROPOSED FINISHED GRADE
84 / 86	INTERPOLATED CONTOUR ELEVATION TOP OF SUITABLE BEARING SOIL IN BUILDING ADDITION. SUITABLE BEARING SOIL CONSISTS OF SUBSOIL PROVIDED IT CAN BE RECOMPACTED IN PLACE, EXCEPT AT B-1, B-2 AND B-16 SUITABLE BEARING SOIL CONSISTS OF GLACIAL TILL.

NOTES

1. BASE PLAN IS AN ELECTRONIC TRANSFER OF "PROPERTY TOPOGRAPHIC SURVEY, DEANS MILL ELEMENTARY SCHOOL, STONINGTON, CT" SHEET 1 OF 1, DATED MARCH 1 2016 (BY MALONE & MACBROOM. LATEST UPDATE APRIL 26, 2016)
2. ELEVATIONS ARE IN FEET AND REFER TO NAVD 1988 DATUM.
3. MILONE AND MACBROOM LOCATED AS DRILLED LOCATIONS OF EXPLORATIONS AND DETERMINED GROUND SURFACE ELEVATIONS.

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DEANS MILL SCHOOL
35 DEANS MILL ROAD, STONINGTON, CT
TEST BORING PLAN

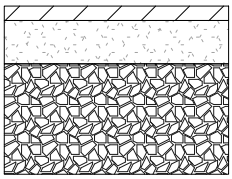
SCALE: 1" = 50'-0" MAY 2016

DRAWING 2

SUMMARY OF PAVEMENT CORES

CORE 1

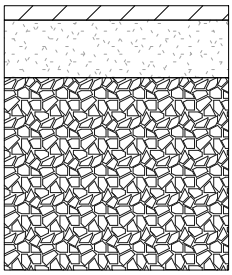
DEPTH (FT.) FROM	TO	DEPOSIT	DESCRIPTION
0 -	0.3	ASPHALT	
0.3 -	1.2	FILL	BROWN COARSE TO FINE SAND, LITTLE GRAVEL AND SILT
1.2 -	3.5	GLACIAL TILL	TAN SANDY GRAVEL, TRACE SILT



BOE AT 3.5 FT.

CORE 2

DEPTH (FT.) FROM	TO	DEPOSIT	DESCRIPTION
0 -	0.3	ASPHALT	
0.3 -	1.5	FILL	BROWN MEDIUM TO FINE SANDY GRAVEL, TRACE SILT
1.5 -	5.5	GLACIAL TILL	DARK GRAY SANDY GRAVEL, TRACE SILT



BOE AT 5.5 FT.

NOTES:

1. REFER TO DRAWING 2 FOR LOCATION OF PAVEMENT CORES.
2. REFER TO APPENDIX B FOR RESULTS OF LABORATORY SOIL TEST.
3. MAJOR SOIL CONSTITUENT IS UNDERLINED.

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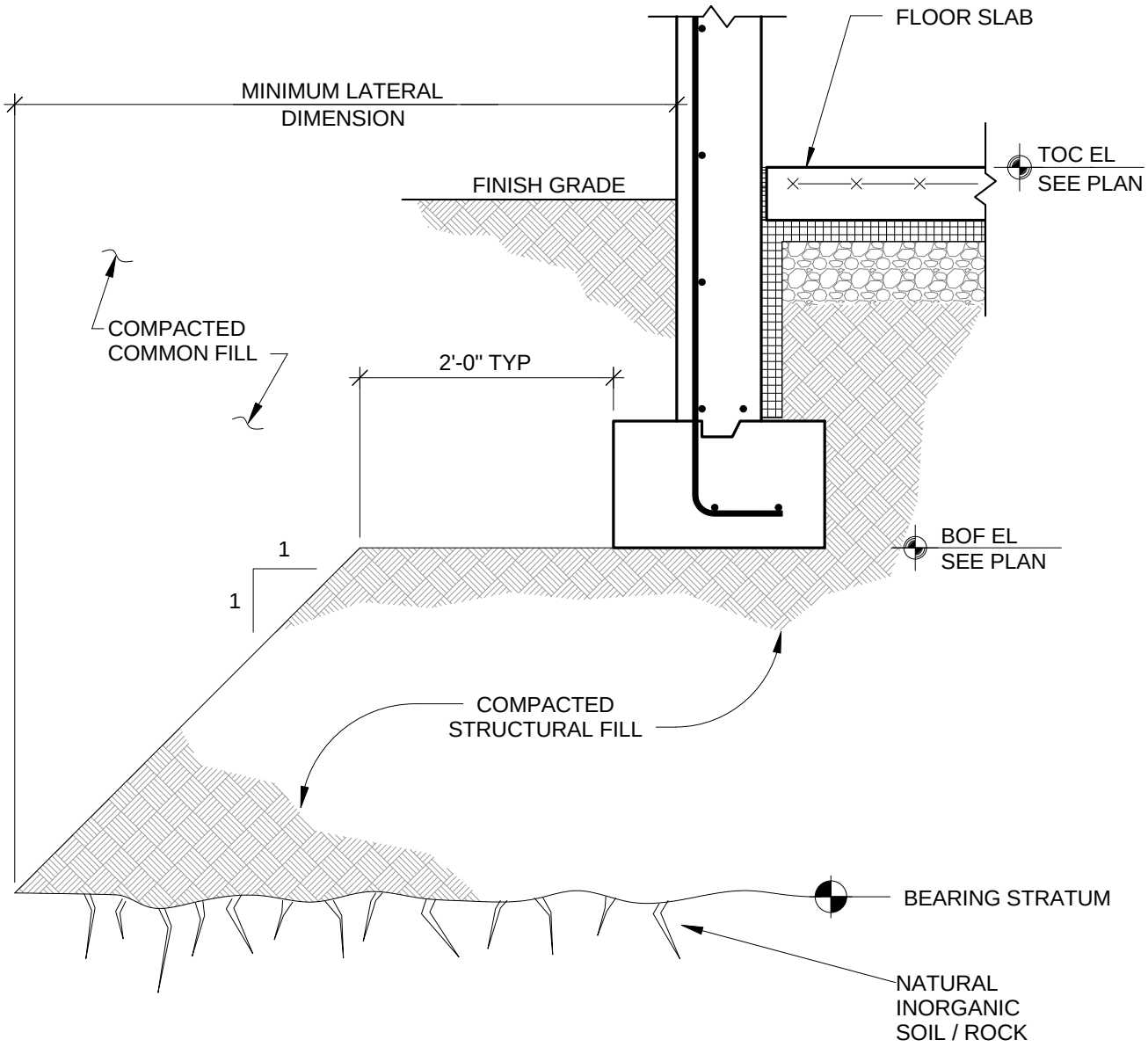
DEANS MILL SCHOOL
35 DEANS MILL ROAD, STONINGTON, CT

SUMMARY OF PAVEMENT CORES

SCALE: 1/4" = 1'-0" MAY 2016



TYPICAL EXTERIOR WALL

1 LIMITS OF COMPACTED STRUCTURAL FILL BELOW FOOTINGS

3/4" = 1'-0"

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DEANS MILL SCHOOL
35 DEANS MILL ROAD, STONINGTON, CT

LIMITS OF COMPACTED STRUCTURAL FILL BELOW FOOTINGS

SCALE: 3/4" = 1'-0" MAY 2016

GNCB
Consulting Engineers, P.C.

Appendix A

Test Boring Logs (B-1 to B-16, C-1 and C-2)

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Dean Mills School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 84.4

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-1
Date Started: 4/19/16		H Auger		HA	S . S.		Line & Station
Date Finished: 4/19/16	Size I. D.			3-1/4"	1-3/8"		Offset L R
Groundwater Observations	Hammer				140 LBS.	Bit	N Coordinate
AT 10.0 AFTER 0.0 HRS	Fall				30"		E. Coordinate
AT AFTER HRS							

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	3" Asphalt
		1.0-2.7	1	20	10	SS	4	7	12	60/2		1) Medium-Brown fine SAND and SILT,
											FILL	fine-medium GRAVEL.
											4.0'	Boulder at 3.0'-3.5'
5												
		5.0-6.4	2	18	14	SS	18	38	38			3) Very dense-Light brown fine-medium
												SAND, some fine-medium gravel,
											TILL	trace silt.
10												
		10.0-10.9	3	11	6	SS	18	50/5				4) Very dense-Brown fine-medium
												SAND, little gravel, trace silt.
											13.0'	Auger refused at 13.0', possible
											EOB	boulder.
15												END OF BORING 13.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 13.5 Feet in Rock 0 No. of Samples 3 **Hole No.** B-1

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Dean Mills School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 84

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar
Date Started: 4/18/16		H Auger		HA	S . S.	
Date Finished: 4/18/16	Size I. D.			3-1/4"	1-3/8"	
Groundwater Observations	Hammer				140 LBS.	Bit
AT 8.0 AFTER 0.0 HRS	Fall				30"	
AT AFTER HRS						

Hole No. B-2

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	3" Asphalt
		1.0-2.7	1	20	14	SS	6	7	13	60/2	2.7'	1) Medium-Dark brown fine-medium SAND and SILT, same fine-medium gravel. (FILL)
5		5.0-6.5	2	18	14	SS	22	37	56			2) Very dense-Brown light brown fine-coarse SAND and fine-medium gravel.
10		10.0-12.0	3	24	10	SS	14	30	21	28	TILL	3) Very dense-Brown fine-coarse SAND, and fine-medium GRAVEL.
15		15.0-17.0	4	24	18	SS	10	34	27	28		4) Very dense-Brown fine-coarse SAND, little silt, little fine-medium gravel.
											18.5'	
20											EOB	Auger refused at 18.5'
												END OF BORING 18.5'
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 18.5 Feet in Rock 0 No. of Samples 4 **Hole No.** B-2

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Dean Mills School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 83.7

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-3
Date Started: 4/18/16		H Auger		HA	S . S.		Line & Station
Date Finished: 4/18/16	Size I. D.			3-1/4"	1-3/8"		Offset L R
Groundwater Observations	Hammer				140 LBS.	Bit	N Coordinate
AT 10.5 AFTER 0.0 HRS	Fall				30"		E. Coordinate
AT 9.5 AFTER 0.50 HRS							

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	4" Asphalt
		1.0-3.0	1	24	14	SS	14	17	7	8	2.0'	1) Top 10"-Medium-Brown silty fine-medium SAND. (FILL)
											3.0'	
		3.0-4.5	2	18	14	SS	32	29	46			Yellow-brown sandy SILT, some fine-medium gravel. (SUBSOIL)
5												
		5.0-5.8	3	11	6	SS	14	50/5				2) Very dense-Brown fine-medium SAND, some silt, some fine-medium gravel.
												3) Very dense-COBBLES.
10											TILL	
		10.0-11.5	4	18	11	SS	10	23	50			4) Very dense-Brown fine-medium SAND and fine GRAVEL.
15												
		15.0-16.4	5	17	14	SS	33	38	50/5		16.4'	5) Very dense-Brown fine SAND and SILT, trace fine gravel.
											EOB	END OF BORING 16.4'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 16.4 Feet in Rock 0 No. of Samples 5 **Hole No.** B-3

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: John Wyant

INSPECTOR: Garry Jacobson

Surface Elevation: 82.9

Date Started: 4/18/16

Date Finished: 4/18/16

Groundwater Observations

AT 10.0 AFTER 0.0 HRS

AT AFTER HRS

PROJECT NAME: Stonington K-12

LOCATION: Dean Mills School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. B-4

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	18	SS	12	21	19	17	1.5'	1) Dense-Dark brown loamy SILT (FILL)
											SUBSOIL	
		2.0-4.0	2	24	20	SS	12	12	13	13	3.5'	2) Medium-Light brown fine-medium sandy SILT
5												
		5.0-7.0	3	24	14	SS	13	24	39	37		3) Very dense-Brown fine-medium SAND and GRAVEL, trace silt.
											TILL	
10												
		10.0-12.0	4	24	12	SS	18	24	28	16		4) Very dense-Brown fine-medium SAND and SILT, some fine-medium gravel.
15		14.0-15.1	5	13	10	SS	28	41	50/1		15.1'	5) Very dense-Same as S-4
											EOB	Split spoon refusal
												END OF BORING 15.1'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 15.1 Feet in Rock 0 No. of Samples 5 **Hole No.** B-4

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Dean Mills School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 82.8

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar
Date Started: 4/18/16		H Auger		HA	S . S.	
Date Finished: 4/18/16	Size I. D.			3-1/4"	1-3/8"	
Groundwater Observations	Hammer				140 LBS.	Bit
AT 10.0 AFTER 0.0 HRS	Fall				30"	
AT AFTER HRS						

Hole No. B-5

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	12	SS	6	10	13	10	.7'	8" Topsoil
											2.5'	1) Medium-Light brown fine-medium
		2.0-4.0	2	24	16	SS	6	14	19	20		SAND and SILT, some fine-medium
												gravel. (SUBSOIL)
5												2) Dense-Orange-brown fine-coarse
		5.0-6.1	3	13	3	SS	17	54	20/1			SAND and SILT, some fine-medium
												gravel.
											TILL	3) Very dense-Same as S-2
10												
		10.0-12.0	4	24	12	SS	24	30	32	41		4) Very dense-Brown fine-coarse
												SAND and fine-medium gravel.
15												
		15.0-16.0	5	12		SS	24	50	10/0"		16.0'	5) Very dense-Brown fine-coarse SAND
											EOB	and fine-medium GRAVEL, some silt.
												Split spoon refusal
												END OF BORING 16.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 16 Feet in Rock 0 No. of Samples 5 **Hole No.** B-5

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT: GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER: John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Dean Mills School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 85.5

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar
Date Started: 4/19/16		H Auger		HA	S . S.	
Date Finished: 4/19/16	Size I. D.			3-1/4"	1-3/8"	
Groundwater Observations	Hammer				140 LBS.	Bit
AT 12.5 AFTER 0.0 HRS	Fall				30"	
AT AFTER HRS						

Hole No. B-6

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	12	SS	5	19	7	7	.8'	7" Topsoil
												1) Medium-Orange-brown fine SAND
		2.0-4.0	2	24	15	SS	7	8	8	8	SUBSOIL	and SILT, some fine-medium gravel.
											4.0'	2) Medium-Orange-brown fine SAND
5												and SILT, little fine-medium gravel.
		5.0-7.0	3	24	12	SS	11	11	10	28		3) Medium-Orange-brown fine-coarse
												SAND and GRAVEL, some silt layers.
											TILL	
10												
		10.0-11.0	4	12	3	SS	28	58				4) Dense-COBBLES, trace fine-coarse
												sand.
15												
		15.0-16.5	5	18	10	SS	18	33	50			5) Very dense-Brown fine-medium
												SAND, and SILT, weathered cobbles.
											18.0'	Grinding from 17.0'-18.0'
											EOB	Auger refused at 18.0'
20												END OF BORING 18.0'
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 18 Feet in Rock 0 No. of Samples 5 **Hole No.** B-6

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT: GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER: John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Dean Mills School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 84.6

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	
Date Started: 4/19/16		H Auger		HA	S . S.		**Hole No.** B-7
Date Finished: 4/19/16							Line & Station
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"		Offset L R
AT 10.0 AFTER 0.0 HRS	Hammer				140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall				30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.4'	5" Asphalt
		1.0-3.0	1	24	10	SS	4	7	11	55	2.5'	1) Medium-Brown fine-medium SAND and GRAVEL, some silt. (SUBSOIL)
5		5.0-7.0	2	24	14	SS	12	30	38	42	TILL	2) Very dense-Light brown fine-medium SAND and fine-medium GRAVEL.
10		10.0-12.0	3	24	17	SS	12	38	44	50		3) Very dense-Brown fine-medium SAND and SILT, same fine-medium gravel. Grinding 14.0'-15.0'
15											15.0'	Auger refusal at 15.0'
											EOB	END OF BORING 15.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 15 Feet in Rock 0 No. of Samples 3 **Hole No.** B-7

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: John Wyant

INSPECTOR: Garry Jacobson

Surface Elevation: 87.5

Date Started: 4/20/16

Date Finished: 4/20/16

Groundwater Observations

AT 9.5 AFTER 0.0 HRS

AT AFTER HRS

PROJECT NAME: Stonington K-12

LOCATION: Deans Mill School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. B-8

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	17	SS	3	5	5	8	.6'	Dark brown loamy fine SAND (TOPSOIL)
											2.5'	
		2.0-3.5	2	18	10	SS	12	39	41			1) Medium-Yellow-brown fine sandy SILT, (SUBSOIL)
5												2) Top 4"-Same as S-1
		5.0-6.5	3	18	10	SS	15	26	47			2) Bottom 6"-Brown fine-medium SAND, and GRAVEL, trace silt and cobbles.
											TILL	
10												3) Very dense-Gray fine-coarse SAND, and fine-coarse GRAVEL little coarse gravel.
		10.0-11.5	4	18	12	SS	9	23	42			4) Very dense-Gray medium-coarse SAND, and coarse GRAVEL, trace silt.
15											15.8'	
		15.0-15.8	5	11	10	SS	24	50/5"			EOB	5) Very dense-Same as s-4
												END OF BORING 15.8'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 15.8 Feet in Rock 0 No. of Samples 5 **Hole No.** B-8

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: Robert Poynton

INSPECTOR: Garry Jacobson

Surface Elevation: 71

Date Started: 4/18/16

Date Finished: 4/18/16

Groundwater Observations

AT Dry AFTER 0.0 HRS

AT AFTER HRS

PROJECT NAME: Stonington K-12

LOCATION: Deans Mill School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. B-9

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	10	SS	3	9	9	12	FILL	1) Medium-Brown fine-coarse SAND, and medium-fine GRAVEL, little silt.
		2.0-2.4	2	5	4	SS	50/5				4.0'	2) Very dense-Brown fine-coarse SAND and fine-coarse GRAVEL, (cobble in tip)
5												Auger refused at 4.0'
10												Offset 5.0' Refusal at 5.0' on boulders in fill
15												Offset 5.0' Refusal at 7.5' on boulders in fill
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 16.5 Feet in Rock 0 No. of Samples 3 **Hole No.** B-9

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
Robert Poynton

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Deans Mill School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 92.4

GBI JOB NO. 92-16

Date Started: 4/18/16

Date Finished: 4/18/16

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. B-10

Line & Station

Offset L R

N Coordinate

E. Coordinate

Groundwater Observations

AT AFTER HRS

AT AFTER HRS

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	8	SS	3	4	3	4	.7'	1) Loose-Dark brown loamy fine SAND,
											SUBSOIL	(FOREST MAT)
		2.0-4.0	2	24	8	SS	5	6	7	4	3.0'	1) Bottom 2" Yellow-brown fine sandy SILT.
5												2) Top 4" Same as S-1
		5.0-7.0	3	24	12	SS	41	27	31	37	TILL	2) Bottom 4" Mottled tan to yellow-brown medium-fine SAND, little gravel.
		7.0-7.4	4	5	3	SS	50/5					3) Very dense-Tan medium-fine SAND, little silt and gravel.
10											10.4'	4) Very dense-Same as S-3
		10.0-10.4	5	5	5	SS	50/5				EOB	5) Very dense-Dark brown micatius medium-fine SAND, little silt.
												Split spoon refused
15												END OF BORING 10.4'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 10.4 Feet in Rock 0 No. of Samples 5 **Hole No.** B-10

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
Robert Poynton

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Deans Mill School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 99.2

GBI JOB NO. 92-16

Date Started: 4/18/16

Date Finished: 4/18/16

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. B-11

Line & Station

Offset L R

N Coordinate

E. Coordinate

Groundwater Observations

AT None AFTER 0.0 HRS

AT AFTER HRS

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	12	SS	2	2	2	3	.8"	1) Very loose-FOREST MAT,
											SUBSOIL	Dark brown loamy fine SAND.
		2.0-4.0	2	24	6	SS	8	12	19	17	2.5'	1) Bottom 10" Yellow-brown fine sandy
												SILT, trace gravel.
5												2) Medium-Top 2" Same as S-1
		5.0-6.8	3	23	20	SS	20	22	35	50/5"		2) Bottom 4" Yellow-brown silty
											TILL	coarse-fine SAND, little gravel.
												3) Very dense-Yellow-brown to tan
												medium-fine SAND, little silt, and
10												gravel.
		10.0-10.3	4	3	0	SS						4) No recovery
											12.0'	Hollow auger refused 12.0'
											EOB	END OF BORING 12.0'
15												Note: Hard augering below 7.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 12 Feet in Rock 0 No. of Samples 4 **Hole No.** B-11

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
Robert Poynton

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Deans Mill School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 105.4

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	Hole No. B-12
Date Started: 4/18/16		H Auger		HA	S . S.		Line & Station
Date Finished: 4/18/16	Size I. D.			3-1/4"	1-3/8"		Offset L R
Groundwater Observations	Hammer				140 LBS.	Bit	N Coordinate
AT None AFTER 0.0 HRS	Fall				30"		E. Coordinate
AT AFTER HRS							

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	4	SS	1	2	2	2	.8'	1) Very loose-Dark brown loamy fine SAND (FOREST MAT)
											SUBSOIL	
		2.0-4.0	2	24	10	SS	4	7	30		2.5'	1) Bottom 2" Yellow-brown fine sandy SILT.
5												2) Dense-Top 4" Same as S-1
		5.0-5.9	3	11	6	SS	33	50/5				2) Bottom 6" Tan medium-fine SAND, little gravel, and silt.
												Note: Augered hard 4.0'-9.'5
												Augered very hard 9.5'-10.0'
10												Hollow auger refused at 10.0'
		10.0-14.0	1	48	20	C						Cored Boulder from 10.0'-14.0'
											TILL	(granitic gneiss)
15		14.0-15.8	4	21	1	SS	10	13	31	50/3		4) Dense-Tan medium-fine SAND, little gravel and silt.
												Note: Roller bit easily to 20.0'
20											20.0'	
											EOB	END OF BORING 20.0'
												Note: No water level determination due to extensive use of water entered into borehole to core boulder and roller bit to 20.0'
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 20 Feet in Rock 0 No. of Samples 4 **Hole No.** B-12

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: Robert Poynton

INSPECTOR: Garry Jacobson

Surface Elevation: 100.1

Date Started: 4/19/16

Date Finished: 4/19/16

Groundwater Observations

AT Dry AFTER 0.0 HRS

AT AFTER HRS

PROJECT NAME: Stonington K-12

LOCATION: Deans Mill School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. B-13

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	12	SS	2	2	2	4	.6'	6" FOREST MAT
											SUBSOIL	1) Very loose-Yellow-brown silty fine
		2.0-3.4	2	17	4	SS	5	10	50/5		2.5'	SAND, (SUBSOIL)
5												2) Very dense-Brown fine-medium SAND and fine-medium GRAVEL, trace silt.
		50-5.9	3	11	6	SS	28	505				3) Very dense-Light gray fine-medium SAND and medium-coarse GRAVEL.
10											TILL	
		10.0-10.4	4	5	4	SS	50/5					4) Very dense-Same as S-3
15												
		15.0-15.4	5	4	2	SS	50/4					5) Pieces COBBLE
20											20.8'	
		20.0-20.9	6	11	8	SS	28	50/5			EOB	6) Very dense-Gray fine-medium SAND and fine-medium GRAVEL, trace silt.
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 20.9 Feet in Rock 0 No. of Samples 6 **Hole No.** B-13

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: Robert Poynton

INSPECTOR: Garry Jacobson

Surface Elevation: 76.7

Date Started: 4/20/16

Date Finished: 4/20/16

Groundwater Observations

AT Dry AFTER 0.0 HRS

AT AFTER HRS

PROJECT NAME: Stonington K-12

LOCATION: Deans Mill School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. B-14

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	14	SS	3	7	9	9	FILL	1) Medium-Brown fine-coarse SAND, some medium-coarse gravel.
		2.0-3.4	2	17	14	SS	47	39	50/5			2) Very dense-Brown fine-medium SAND, and fine-medium GRAVEL,
5											5.0'	trace organics.
		5.0-6.5	3	18	14	SS	12	46	50		TILL	3) Very dense-Brown coarse SAND and coarse GRAVEL, trace silt.
10											10.0'	Refusal at 10.0' on augers
											EOB	END OF BORING 10.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 10 Feet in Rock 0 No. of Samples 3 **Hole No.** B-14

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
Robert Poynton

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Deans Mill School, Stonington, CT

DESIGN ENGINEER

Surface Elevation:

GBI JOB NO. 92-16

Date Started: 4/20/16	TYPE	S Auger		Casing	Sampler	Core Bar
Date Finished: 4/20/16		H Auger		HA	S . S.	
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"	
AT Dry AFTER 0.0 HRS	Hammer				140 LBS.	Bit
AT AFTER HRS	Fall				30"	

Hole No. B-15

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.5'	TOPSOIL*
											2.5'	SUBSOIL*
5											TILL	
		5.0-7.0	1	24	2	SS	13	12	17	21		1) Medium-Brown fine-medium SAND, trace gravel.
		7.0-8.3	2	18	8	SS	20	32	50/4"		8.3'	2) Very dense-Brown fine-medium
10											EOB	SAND, and fine-medium gravel, trace silt.
												END OF BORING 8.3'
15												*Inferred descriptions from auger spoil
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 8.3 Feet in Rock 0 No. of Samples 2 **Hole No.** B-15

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: Dean Mills School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 85.3

GBI JOB NO. 92-16

Date Started: 4/19/16	TYPE	S Auger		Casing	Sampler	Core Bar
Date Finished: 4/19/16		H Auger		HA	S . S.	
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"	
AT Dry AFTER 0.0 HRS	Hammer				140 LBS.	Bit
AT AFTER HRS	Fall				30"	

Hole No. B-16

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.4'	3" ASPHALT
											1.6'	FILL*
											TILL	
5												
		5.0-6.9	1	24	18	SS	25	43	38	50/4	6.8' EOB	1) Very dense-Brown fine-medium SAND and fine-medum GRAVEL, trace silt.
												END OF BORING 6.8'
10												
												*Inferred description from auger spoil
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 6.8 Feet in Rock 0 No. of Samples 1 **Hole No.** B-16

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: John Wyant

INSPECTOR: Garry Jacobson

Surface Elevation: 91.2

Date Started: 4/19/16

Date Finished: 4/19/16

Groundwater Observations

AT Dry AFTER 0.0 HRS

AT AFTER HRS

SOIL ENGINEER

PROJECT NAME: Stonington K-12

LOCATION: Dean Mills School, Stonington, CT

DESIGN ENGINEER

GBI JOB NO. 92-16

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. C-1

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	18	12	SS	21	27	50		.4'	Asphalt
											1.3'	1) Very dense-Brown fine-coarse
		2.0-3.5	2	18	5	SS	58	49	50		3.5'	SAND AND SILT, little fine-medium
											EOB	gravel. (FILL)
5												2) Very dense-Tan sandy GRAVEL,
												trace silt.
												END OF BORING 3.5'
10												
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 3.5 Feet in Rock 0 No. of Samples 2 **Hole No.** C-1

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: John Wyant

INSPECTOR: Garry Jacobson

Surface Elevation: 73.9

Date Started: 4/19/16

Date Finished: 4/19/16

Groundwater Observations

AT Dry AFTER 0.0 HRS

AT AFTER HRS

PROJECT NAME: Stonington K-12

LOCATION: Dean Mills School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. C-2

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		.5-2.0	1	18	10	SS	13	15	12		.3'	4" Asphalt
											1.5' FILL	1) Medium-Brown fine-medium sandy GRAVEL, trace silt.
		2.0-4.0	2	24	14	SS	8	6	11	17		
											TILL	2) Medium-Dark brown sandy GRAVEL,
5		4.0-5.5	3	18	2	SS	11	10	36		5.5'	trace silt.
												3) Dense-Same as S-2
												END OF BORING 5.5'
10												
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 5.5 Feet in Rock 0 No. of Samples 3 **Hole No.** C-2

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

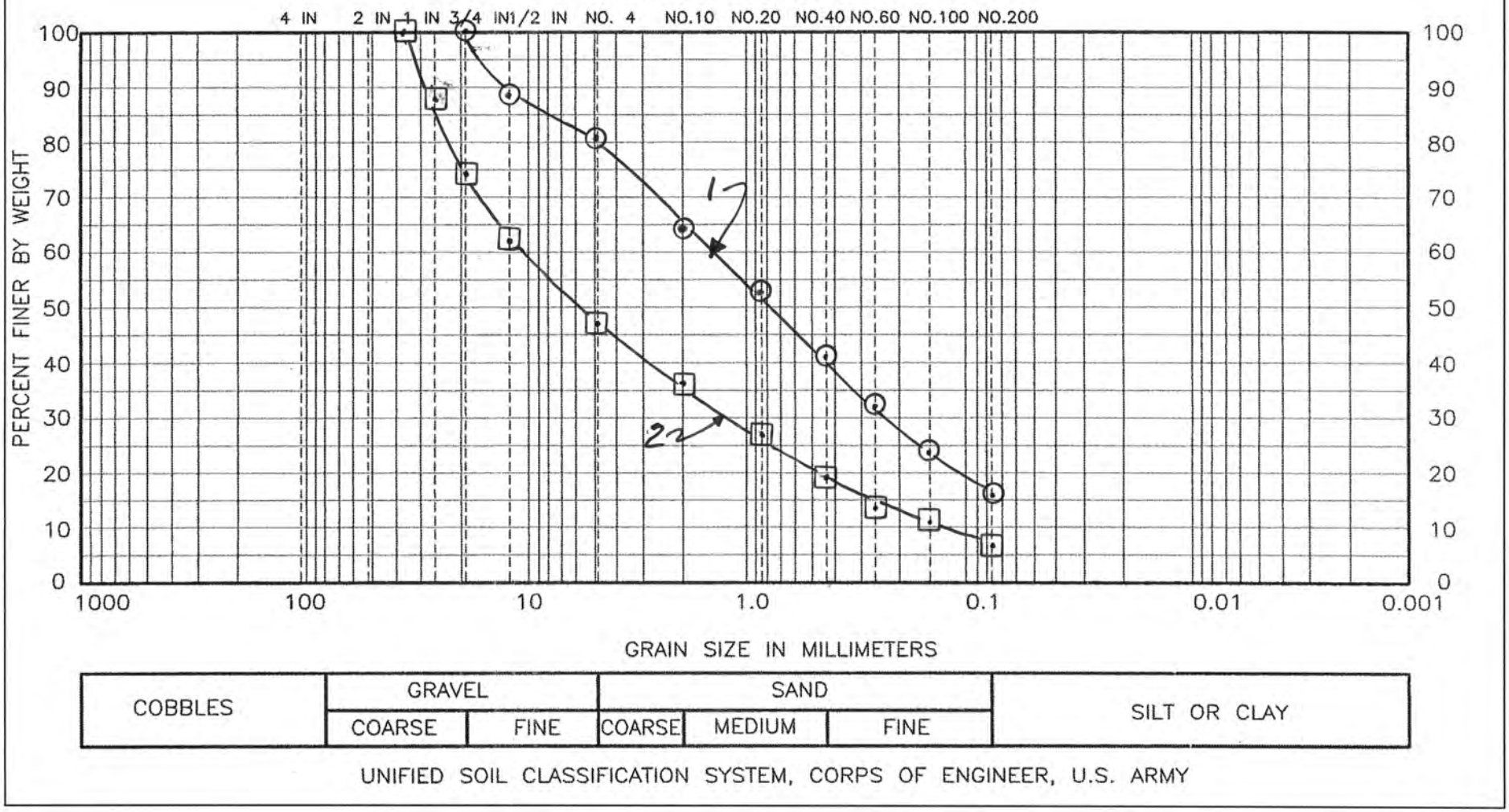
GNCB
Consulting Engineers, P.C.

Appendix B

Grain Size Distribution Plots

GNCB
Consulting Engineers, P.C.

GRAIN SIZE DISTRIBUTION



UNIFIED SOIL CLASSIFICATION SYSTEM, CORPS OF ENGINEER, U.S. ARMY

TEST NO.	CORE NO.	DEPTH (FT.)	WATER CONTENT (%)	DESCRIPTION
1	C1	0.3 – 1.2	8.8	Brown coarse to fine SAND Little gravel and silt
2	C1	1.2 – 3.5	7.1	Tan sandy GRAVEL, trace silt

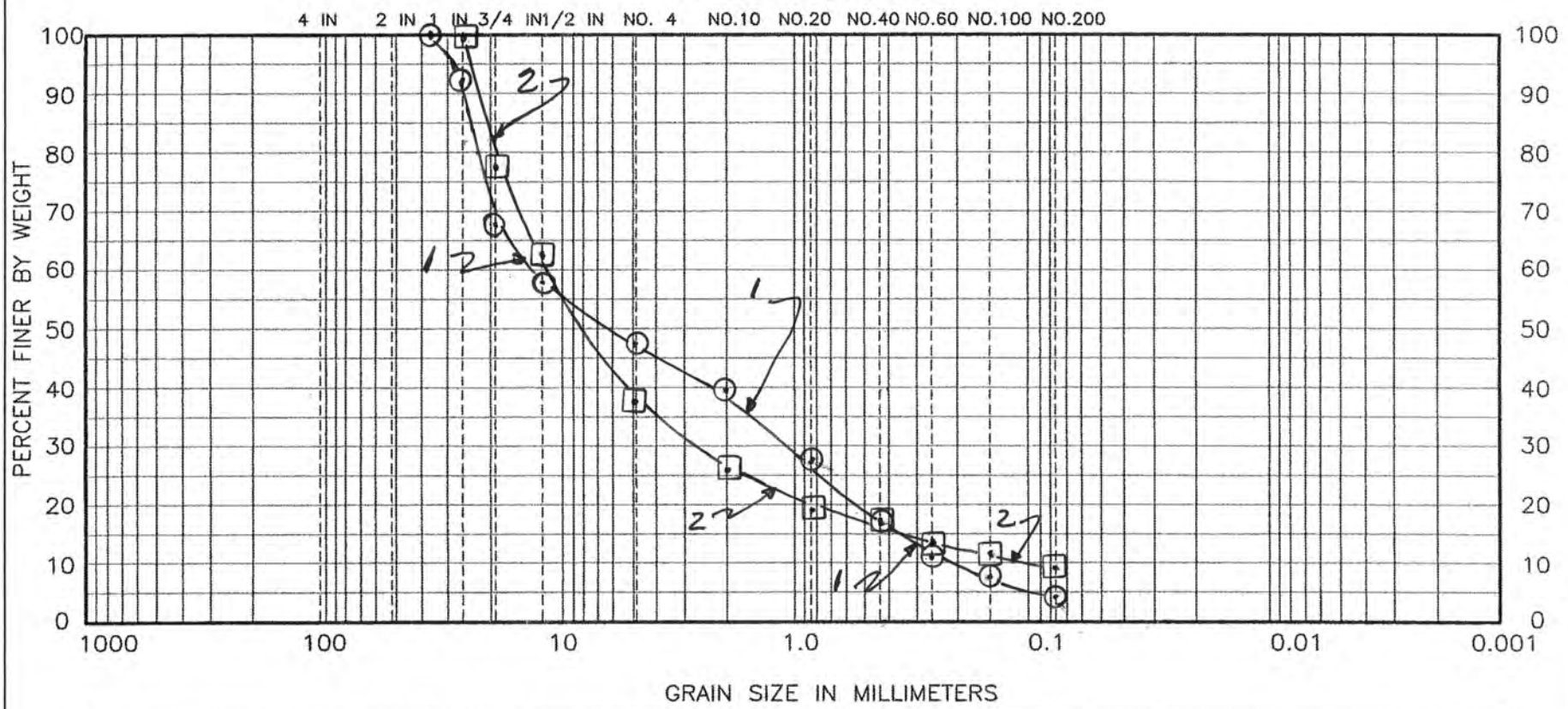
PROJECT NO. 16051.09 DATE: May 16

Deans Mill School

FORM G-101 (MAY 2014)

GNCB
Consulting Engineers, P.C.

GRAIN SIZE DISTRIBUTION



UNIFIED SOIL CLASSIFICATION SYSTEM, CORPS OF ENGINEER, U.S. ARMY

TEST NO.	CORE NO.	DEPTH (FT.)	WATER CONTENT (%)	DESCRIPTION
1	C2	0.3 – 1.5	4.9	Brown medium to fine sandy GRAVEL, trace silt
2	C2	1.5 – 5.5	19.8	Dark gray sandy GRAVEL, trace silt

PROJECT NO. 16051.09 DATE: May 16

Deans Mill School

FORM G-101 (MAY 2014)

GNCB
Consulting Engineers, P.C.

Appendix C

Technical Provisions of Specifications for Compacted Structural Fill

TECHNICAL PROVISIONS OF SPECIFICATIONS
FOR COMPACTED STRUCTURAL FILL

PART 1 – GENERAL:

1.01 DESCRIPTION OF WORK

The work covered by this specification consists of furnishing all plant, labor, equipment and materials and performing all operations in connection with excavation, preparation of subgrade, and providing, placing and compacting Structural Fill within the building.

1.02 QUALITY ASSURANCE

Monitoring of earthwork operations will be provided by the Owner. Suitable test methods for the Owner's testing laboratory to determine the in-place dry density of the compacted lifts include: ASTM D6938-10 (Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods, ASTM D1556-07 (Standard Test Method for Density and Unit Weight of Soil In Place by the Sand Cone Method), or other methods approved by the Engineer.

The Contractor shall not place a layer of fill until the Owner has observed the underlying materials.

PART 2 – PRODUCTS:

2.01 STRUCTURAL FILL

Structural fill shall be suitable gravel, sandy gravel, or gravelly sand, free of organic material, loam, trash, snow, ice, frozen soil and other objectionable material and shall be well-graded within the following limits:

Sieve Size	Percent Finer by Weight
4 inches	100
No. 4	20 – 80
No. 40	5 – 50
No. 200	0 – 10

Excavated material is not suitable for use as Structural Fill. The inorganic excavated materials may be used as common fill outside the building limits or may be disposed of in accordance with arrangements previously made with the Owner. Organic soil and surplus excavated soil shall be legally disposed of.

All material is subject to approval by the Owner's representative.

PART 3 – EXECUTION:

3.01 SUBGRADE PREPARATION

Remove all topsoil, fill, and subsoil within 18 in. of new building slab and footings and other unsuitable materials from the area of the building and to lateral limits extended beyond the footings a distance equal to the depth of fill required below the footing plus two feet. Upon completion of the excavation, the soil subgrade shall be compacted by at least six coverages with the treads of a crawler type tractor weighing at least 30,000 pounds, with the rear wheels of a fully loaded ten-wheel dump truck, or by a suitable 10-ton vibratory roller as approved by the Owner. Where, in the opinion of the Owner, compaction of the subgrade is not desirable, the above compaction requirements will be waived.

3.02 PLACEMENT OF COMPACTED SRUCTURAL FILL

Structural fill shall be placed in layers not to exceed ten inches in thickness as measured before compaction. Each layer shall be compacted by a minimum of four coverages with the equipment described below to a dry density at least 95 percent of maximum dry density as determined by ASTM Test D1557. Incidental compaction due to traffic by construction equipment will not be credited toward the required minimum four coverages.

Compaction equipment in open areas shall consist of vibratory rollers, fully loaded ten-wheel dump trucks, or other compaction equipment approved by the Owner. Compaction equipment in confined areas (in trenches and adjacent to walls, piers and footings) shall consist of hand-guided vibratory equipment or mechanical tampers as approved by the Owner. Layer thickness prior to compaction, shall not exceed nine inches or 6 inches when using hand guided vibratory compactors..

All fill material shall be placed and compacted "in-the-dry". The Contractor shall dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed state of the existing soil subgrade.

The Contractor shall not place a layer of compacted structural fill on snow, ice or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be required as directed by the Owner.
In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.

Compacted fill shall not be placed when temperatures are below freezing.

Stonington K-12 Modernization Project
Addition to West Vine School
17 West Vine Street
Stonington, Connecticut

Report on Geotechnical Engineering Investigation

August 25, 2016

Prepared By:
GNCB Consulting Engineers, P.C.
Old Saybrook, Connecticut

Prepared For:
Town of Stonington
Stonington, Connecticut

GNCB
Consulting Engineers, P.C.

Structural Engineering
Geotechnical Engineering
Historic Preservation
Construction Support

August 25, 2016

Town of Stonington
152 Elm Street
Stonington, Connecticut 06378

Principals
Kenneth Gibble, P.E.
James F. Norden, P.E.
Charles C. Brown, P.E.

Geotechnical Associate
David L. Freed, P.E.

Structural Associate
Richard A. Centola, P.E.

Attention: Mr. James Sullivan, Director of Finance

Re: Report on Geotechnical Engineering Investigation
Stonington K-12 Modernization Project
Addition to West Vine School
17 West Vine Street, Stonington, Connecticut

Dear Mr. Sullivan:

We are transmitting to you two (2) hard copies of our geotechnical engineering report that summarizes the results of test borings and foundation design recommendations for the Addition to West Vine School in Stonington, Connecticut. An electronic copy of the report is also being transmitted to your project representative, Mr. Charles Warrington of Colliers International and to your architect, Mr. Anwar Hossain of Drummey Rosane Anderson, Inc. Our work was undertaken in accordance with your authorized contract agreement dated April 15, 2016.

In summary, the results of 15 test borings (refer to Drawing 2 for locations) indicate that subsurface conditions within the building addition typically consists of a thin surface topsoil, man-placed fill and subsoil, underlain by a thick deposit of glaciofluvial sand that typically consists of a gray silty medium to fine SAND with gravel and silt. Groundwater, at the building addition, is about 9 ft. below the new ground floor slab and does not appear to be a site factor. We recommend that the proposed building addition be supported on conventional spread footing foundations with a slab-on-grade concrete ground floor bearing on the naturally-deposited glaciofluvial sand or on compacted structural fill placed on the suitable

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gncbengineers.com

GNCB
Consulting Engineers, P.C.

bearing materials after removing the surface topsoil, man-placed fill, and subsoil.

We appreciate the opportunity to work with you on this aspect of the project. If you have any questions, or need additional information, please call.

Sincerely yours,

David L. Freed, PE
Geotechnical Associate

GNCB
Consulting Engineers, P.C.

Table of Contents

I. PURPOSE AND SCOPE:

The purpose of this study was to investigate soil, rock and groundwater conditions at the site, and to develop geotechnical engineering recommendations for construction of a building addition and associated site work to West Vine School in Stonington, Connecticut. Comments on geotechnical engineering aspects of site development and construction are also provided.

To achieve these objectives, GNCB Consulting Engineers, P.C. (GNCB) completed the following scope of work:

- Developed and monitored a program of 15 test borings (B-1 to B-15) and two core holes (C-1 and C-2) to investigate the existing pavement cross section.

- Conducted engineering analyses for final design regarding building foundations, including soil bearing capacity, settlement, seismic requirements, and other aspects of project site design, such as retaining walls and pavement design.

- Prepared an engineering report that summarizes the work completed.

During our investigation, GNCB worked in association with the following design team members:

Owner's Rep:	Colliers International, Stratford, Connecticut
Architect:	Drummey Rosane Anderson, Inc. South Windsor, Connecticut
Structural Engineer:	Szewaczak Associates, Avon, Connecticut
Civil Engineer:	Milone & MacBroom, Cheshire, Connecticut

II. SITE LOCATION AND SURFACE CONDITIONS:

The approximately 10-acre elementary school complex, is located on the north side of West Vine Street, approximately 800 ft. east from its intersection with Route 2, in the Pawcatuck area of Stonington, Connecticut, as approximately shown on Drawing 1, "Project Locus." The existing school, which is skewed to the northwest from West Vine Street, is comprised of a two-story rectangular-shaped building built in 1967. Children's paved and dirt playground areas exist northwest of the existing building. Open grass and paved parking areas exist between the school building and West Vine Street, while dense wooded areas exist north of the school building.

Ground surface within the area paved playground area located northwest of the existing school building (i.e. area of the building addition), slopes gradually upward towards the southwest from about El. 88 (adjacent to the existing building) to about El. 92. Ground surface continues to drop towards the south, towards West Vine Street, to about El. 71 and rises (within the wooded area to the north) to about El. 120 where a large outcrop of bedrock has been mapped by others. (Note: Elevations are in feet and refer to NAVD 88 Datum). We understand that a majority of the off-site utilities (i.e. electric, gas, communications) enter the site from the street.

The existing site topography, as well as locations of site features/utilities, is shown on a March 11, 2016 "Boring Location Plan", Drawing No. B-1, prepared by and included with the RFP for geotechnical services. This map has been used as a base plan for the attached Drawing 2, "Test Boring Plan."

III. PROPOSED CONSTRUCTION:

The significant new building addition and site construction is shown on Schematic Design Drawings (dated March 11, 2016) that we received at the time we submitted a proposal for work and on a preliminary Site Grading Plan (dated

April 1, 2016) prepared by Milone & MacBroom. The new construction includes the following:

- A new 2-story rectangular building addition, to include classrooms, gym, and cafeteria, that abuts the northwest side of the existing building.
- A paved bus drop area north of the combined new school building.
- Paved parking and circular access ways between the combined school building and West Vine Street.

The building addition will have a total footprint of about 19,000 sq. ft. within a Y-shaped area. The ground floor level for the building addition will match existing building floor at El. 89.6. This finish floor grade ranges from a few feet below to a few feet above existing site grade. The addition will be of masonry wall construction with perimeter and interior column support. We understand that the addition will have clear spans up to about 65 ft., however column spacing will typically be about 25 to 30 ft. We have received a schematic foundation layout plan from the structural engineer; we understand from this plan that the new building dead plus live column loads will be in the range of 150 kips or less, and 3 to 5 kips per lin. ft. along the building perimeter walls.

The south paved parking and access ways, as well as the north bus drop area, will have a finish grade at the approximate existing grade.

Details of the proposed construction, as reported herein, is shown on the attached Drawing 2, “Test Boring Plan.” The areas of new pavement have been shown, as well as proposed finish grading.

IV. SUBSURFACE INVESTIGATIONS:

A. Test Borings

We are not aware of any previous test borings completed within the areas of new construction. However, we have received the results of several

test pits recently excavated by Milone & MacBroom for their civil studies; the test pits are located on the attached Drawing 2.

For current building and site design, GNCB concurred with the recommended program of 14 test borings (B-1 to B-14), prepared by others; GNCB added an additional boring (B-15) at the proposed building addition. These explorations were drilled during the period April 20 to 22, 2016 at the approximate locations shown on Drawing 2. GNCB monitored the field work and prior to the work located explorations in the field by taping from existing site features shown on the base plan. However, the project civil engineer located the as-drilled test borings and determined ground surface elevations by instrument survey after the work was completed. The attached Table I summarizes the soil conditions encountered at each test boring; detailed soil descriptions are contained in the following report section. Logs of the test borings, prepared by the contractor and reviewed by GNCB, are included as Appendix A.

General Borings, Inc. of Prospect, Connecticut, under contract to GNCB, drilled the test borings using either a standard Model B-53 truck rig, a tracked bombardier rig, or a special drill rig mounted on a rubber-tired backhoe to advance 3-1/4 inside diameter hollow stem augers (HSAs). Near continuous soil samples (ASTM D 1586) were obtained within the upper 7 ft. The test borings, which ranged in depth from 10.0 to 18.5 ft., all terminated within naturally-deposited granular soils. A number of the test borings encountered refusal within the granular soils; of these borings, bedrock core samples were obtained at B-6, B-10, B-11, B-14, and B-15 to confirm that refusal represented the bedrock surface.

B. Pavement Cores and Grain Size Analysis Tests

In addition to the above noted test borings, the existing pavement and underlying material within about 4 ft. of grade was examined at two core locations, C-1 and C-2. Logs of the soils encountered were also prepared

by the contractor; GNCB prepared a graphical vertical plot of the test boring results as shown on the attached Drawing 3, "Summary of Pavement Cores." In addition, recovered test boring samples were submitted to a laboratory, Angus McDonald Gary Sharpe Associates, for gradation testing by ASTM D422. The results of five washed grain size analysis tests are included as Appendix B.

V. SUBSURFACE AND GROUNDWATER CONDITIONS:

A. Subsurface Conditions

The subsurface explorations indicated at least three near surface subsurface soil strata (organic soil/asphalt, man-placed fill and subsoil) underlain by glaciofluvial sands. The subsurface strata encountered in the subsurface explorations are described below, progressing downward from ground surface:

Asphalt, Topsoil, and Forest Mat: The site is blanketed by a thin surface organic soil, either topsoil (open area) or a forest mat (wooded areas) or asphalt pavement. The organic soils, which typically consist of a dark brown loamy fine SAND, with various root matter, is typically 0.3 to 0.8 ft. thick but is as much as 1 ft. in wooded areas. The asphalt is typically 3 to 4 in. thick.

Man-Placed Fill: At a few random locations, a man-placed fill directly underlies the surface materials. The fill, which we suspect is due to previous site grading, is generally a brown to tan medium dense coarse to fine SAND, little silt and gravel. The fill, where encountered, is typically 1.2 to 2.7 ft. thick.

Subsoil: The forest mat within wooded areas and the topsoil/pavement and fill at open areas was underlain by subsoil that was typically 1 to 3 ft.

thick. The subsoil generally consists of a yellow brown fine sandy SILT to silty fine SAND. Subsoil existed at most test boring locations, but may be absent in localized areas due to previous site grading.

The combined thickness of surface organic soils/asphalt materials, man-placed fill, and subsoil is typically from 1.5 to 5.0 ft. in thickness.

Glaciofluvial Sands: The dominant soil type at the site is a deposit of glaciofluvial sand. This deposit typically consists of a brown to tan coarse to fine SAND, little gravel, trace to little silt grading to a sandy GRAVEL, little silt. The glaciofluvial deposit is typically about 10 to 15 ft. thick. The elevation top of the glaciofluvial sand (and the subsoil described above) is tabulated for each test boring on Table I.

Bedrock: As stated, bedrock outcropping exist within the wooded area of the site and bedrock was cored at five test borings. Except as noted below at B-11, the bedrock cores and outcroppings show a hard coarse grained pink GRANITE. In general, his rock type appears relatively fresh, however at B-9, a weathered zone was encountered, which could be augered and sampled with the split spoon. At B-11, bedrock consists of a softer, relatively weathered dark gray thinly foliated GNEISS. GNCB observed similar low lying outcrops immediately south of B-11. Regional bedrock mapping confirms an east-west trending contact between these rock types passing through the south end of the site. Where encountered at test borings, Table I summarizes the elevation top of rock.

B. Groundwater Conditions

A number of the test borings encountered groundwater; the observed water levels are summarized on Table I. These water levels, however, were made at the completion of the test borings and sufficient time may not have elapsed for the water to stabilize to its static level. Within the

building addition, water was observed within the test borings between El. 79 and El. 80. In any event, water levels vary with precipitation, season, and other factors. As a result, water levels encountered during and after construction may differ from those observed in the test borings.

VI. FOUNDATION AND SITE DESIGN CRITERIA:

A. Building Foundations and Ground Floor Slab

In our opinion, surface topsoil, asphalt, man-placed fill, and subsoil are not suitable to support the building frame or ground floor slab. The glaciofluvial is a suitable bearing material. While the subsoil was considered a suitable bearing material at the Deans Mill School, its close proximity to the proposed building finish slab grade and footings at the West Vine School makes it not suitable for this project. We recommend that within the building addition, and to the proper lateral limits, that the unsuitable materials (topsoil, asphalt, man-placed fill, and subsoil) be removed, and be replaced with compacted (off-site) structural fill. Accordingly, we recommend that the building walls and columns be supported on reinforced concrete spread footings bearing on the naturally-deposited glaciofluvial sand or on compacted structural fill placed on the suitable bearing soils.

Drawing 2 shows contours of the top of suitable bearing material (glaciofluvial sand), as interpolated from the test borings. These contours gradually slope down from northwest to southeast ranging from El. 88 to El. 84. We anticipate that nearly all of the foundation footings will be bearing within the glaciofluvial sand or compacted structural fill.

Based on current design information, we recommend the following criteria for foundation design:

1. Design in accordance with the current State of Connecticut Building Code.
2. For frost protection, locate bottoms of footings at least 3.5 ft. below exterior ground surface exposed to freezing.
3. Proportion footings for a net allowable soil bearing pressure equal to 1.7 times the least footing dimension as measured in feet, up to a maximum of 5 kips per sq. ft. (ksf). The minimum footing width shall be 18 in.
4. The design allowable soil bearing pressure may be increased by 1/3 for transient loads.
5. Where compacted structural fill is used to support building footings and slabs, carry the foundation preparation and new fill to lateral limits extending a distance beyond the edge of the footing equal to the depth of fill below footing plus two feet, as shown on Drawing 4, "Limits of Compacted Structural Fill Below Footings."
6. We expect that total footing settlement will range from ½ to ¾ in. Footing settlement is expected to occur as the load is applied. We do not expect that differential settlement between footings will exceed ½ in., for footings typically spaced about 30 ft. apart.
7. Remove all topsoil, asphalt, man-placed fill, and subsoil within 18 in. of the bottom of footing and/or slab foundations, from the building limits, and to the lateral limits required for placement of compacted structural fill. Prior to placing any structural fill within the building, recompact the prepared subgrade with at least 6 passes of a vibratory roller that weighs at least 10 tons. Replace any soils that are visually unstable with compacted structural fill.

   Provide a minimum 12 in. thickness of compacted structural fill below building ground floor slabs.

B. Foundation Drainage

Due to the approximate 9 ft. depth of the groundwater below the building slab, and lack of a basement area, we do not recommend a perimeter foundation or underslab drainage system at the building addition.

C. Lateral Earth Pressures

The building design does not include below grade foundation walls which require retaining of soil. We can provide design lateral earth pressure criteria if basement walls are needed.

D. Seismic Criteria

Based on the test boring information, we recommend a site soil classification of Class C for seismic design. The mapped MCE spectral response acceleration values for Stonington, Connecticut are S_1=0.057 for one second period and S_s = 0.208 or short period. The natural inorganic glacial till, subsoil, or compacted structural fill to be placed are all not susceptible to liquefaction.

E. Compacted Fills

a. Compacted Structural Fill

Fill for use as compacted structural fill within the building footprint, both below the footings and ground floor slab, should consist of sandy gravel or gravelly sand, free of organic material, snow, ice or other unsuitable materials, and should be well graded within the following limits:

Sieve Size	Percent Finer By Weight
4 in.	100
No. 4	20 - 80
No. 40	5 - 50
No. 200	0 – 10

Compacted structural fill should be placed in horizontal layers having a maximum loose lift thickness of 10 in. (open areas) or 6 in. (confined areas). Each layer should be compacted to a dry density at least 95 percent of the maximum dry density as determined in accordance with ASTM Test Designation D1557.

The existing on-site soils are not suitable for use as compacted structural fill. Appendix C includes recommended technical provisions of specifications for compacted structural fill to be placed within building limits.

b. Compacted Common Fill

Beyond the limits of compacted structural fill placed for structures, compacted common fill may be used for site grading within paved and landscape areas. The requirements for compacted structural fill shall apply for common fill, with the following exceptions:

- The maximum stone size shall be 8 in.
- The range of percent passing the No. 200 sieve shall be 0 to 25 percent.
- The fill may be placed in maximum loose lifts of 12 in., when compacted by heavy equipment.
- Fill should be systematically compacted to a dry density that is at least 93 percent of the maximum dry density as determined in accordance with ASTM D1557.
- With regard to subgrade preparation for common fill areas, the surface topsoil and organic soil should be removed prior to placing common fill, however the existing man-placed fill and/or subsoil may be left in place. The subgrade should be recompacted per the requirements for compacted structural fill.
- We anticipated a majority of the on-site non-organic soils to be

excavated will be suitable for use as common fill, however their successful placement and compaction will be difficult due to their high silt content and susceptibility to remain saturated.

F. Site Perimeter Slopes and Retaining Walls

We anticipate that site design to accommodate and meet the higher grades to the north of the building addition and slightly lower grades south of the building addition, can be satisfied with open slope grading.

We recommend that soil cut slopes north of the building addition within the natural granular soil, be no steeper than 2 hor: 1 ver. Furthermore, the slopes within the existing man-placed fill and new built up slopes south of the building addition be no steeper than 3 hor: 1 ver. All these slopes may be covered with a loam and seed. We do not anticipate that toe drains will be needed at the base of slopes.

We are not aware of any new retaining walls. If needed, we suggest the following wall types be considered:

- Conventional reinforced concrete.
- Segmented modular blocks (such as Versa-Lok) with horizontal reinforced geogrids.
- Dry laid stone walls.

Walls should be designed for static cantilever soil loads. In addition, the backside of the walls should be lined with a pervious free draining material; the gradation for compacted structural fill contained herein is appropriate except the maximum percent finer by weight should not exceed 8 percent. We can provide specific design criteria if needed.

G. Paved Areas

As indicated previously, new paved parking areas for vehicle and heavy bus traffic are planned both north and south of the new building addition.

At the Buss Drop-Off and new paved parking area north of the building addition, new paved areas will require a cut in grade. The existing topsoil and forest mat materials should be removed from new paved areas. We anticipate that subgrade areas will consist of the dense glaciofluvial sand. New common fill may be needed within the new paved parking areas south of the building addition. In our opinion, the existing glaciofluvial sand and new fill are suitable for support of pavement design section. We suggest that the prepared subgrades be proof rolled by at least 4 passes of a fully loaded dump truck. Any visually soft areas should be removed and replaced with compacted structural fill. Subgrades should be sloped with a minimum1/2 percent slope to provide drainage.

We recommend the following pavement design section for vehicle and heavy truck traffic areas:

	Recommended Thickness (in.)	
	Vehicle Areas	Heavy Traffic
Bituminous Concrete (2 lifts)	3.0	4.5
Processed Stone (CTDOT Form 816/Sec M.05.01)	6.0	8.0
GravelBase (CTDOT Form 816/Sec M.02.06 Grading A)	10.0	12.0

Provide an additional 8 in. of Gravel Base within the south parking area where new fill will be placed and or in any areas where bedrock is at subgrade level.

VII. CONSTRUCTION CONSIDERATIONS:

A. General

This report section provides comments related to foundation construction, earthwork, and other geotechnical aspects of the project. It will aid those responsible for preparation of contract plans and specifications and those involved with construction monitoring. The contractor must evaluate potential construction problems on the basis of their own knowledge and experience in the area and on the basis of similar projects in other localities, taking into account their own proposed construction equipment and procedures.

B. Excavation

Minimal excavation will be required within the new building addition, to remove unsuitable bearing materials. The largest anticipated depth of excavation exists at the north cut area within the bus drop area. Based on the test borings, it appears that the majority of excavated soils will consist of topsoil/forest mat, the existing man-placed fill and subsoil within the building addition, and the glaciofluvial sand within the north cut area. We expect that normal construction equipment will be adequate for soil removal. Excavation geometry should conform to OSHA excavation regulations contained in 29 CFR Part 1926 dated October 31, 1989. Temporary slopes of 1.5 hor: 1 ver should be stable.

Excavation should not be made below a 2 hor:1 ver line drawn from the outside bottom of an existing footing that remains, such as along the northwest side of the building to remain. Excavation made below this line may require underpinning of the existing foundation that remains.

C. Dewatering

We do not anticipate that groundwater will be a site issue. In addition, we expect that the site will drain water easily. Any rainwater which accumulates within excavations should be removed by open sump pumping.

D. Preparation of Bearing Surfaces

Following footing excavation, we recommend that the soil bearing surfaces be recompacted with hand-guided vibratory equipment prior to forming and concreting. Due to the potential for the soil subgrades to become disturbed or damaged due to rainfall or workmen, we suggest that prepared footing bearing surfaces that are not concreted within 24 hours be protected with a lean concrete mud mat or thin 3 in. layer of fine crushed stone. The geotechnical engineer may waive the requirement for recompacting footing bearing surfaces in the event that groundwater levels may be in close proximity to the exposed surface.

E. Construction Monitoring

The recommendations contained in this report are based on the known and predictable behavior of properly engineered and constructed foundations and other facilities. During construction, it will be necessary that experienced personnel be engaged to observe the excavation of unsuitable materials, placement of compacted structural/common fill, and preparation of footing and slab bearing surfaces. As part of GNCB contracted work, we plan to visit the site several times during foundation excavation to observe prepared bearing surfaces.

VIII. LIMITATIONS OF RECOMMENDATIONS:

This report has been prepared for specific application to the Addition to West Vine School project in Stonington, Connecticut, in accordance with generally accepted geotechnical engineering practice. No other warranty, express of implied, is made. In the event that different subsurface soil conditions are encountered during construction, the conclusions and recommendations contained in the report must be reviewed for continued applicability to the project, and verification be documented in writing.

The analyses and recommendations in this report are based in part upon data obtained from the referenced test borings. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the preliminary recommendations contained herein.

As part of our contracted scope of work, GNCB plans to review the structural foundation drawings and site drawings and specifications to confirm that our geotechnical engineering recommendations have been followed.

GNCB
Consulting Engineers, P.C.

Tables

Table I – Summary of Test Borings

GNCB
Consulting Engineers, P.C.

TABLE I

SUMMARY OF TEST BORINGS

STONINGTON K-12 MODERNIZATION PROJECT
17 WEST VINE STREET SCHOOL
PAWCATUCK, CONNECTICUT

TEST BORING NO.	TOTAL DEPTH (FT.)	GROUND SURFACE ELEV. (FT.)	ELEV. WATER (FT.)	THICKNESS STRATA (FT.)					ELEVATION TOP (FT.)		
				FOREST MAT (FM) TOPSOIL (T) ASPHALT(A)	MAN-PLACED FILL	SUBSOIL	GLACIO-FLUVIAL	ROCK	SUBSOIL	GLACIO-FLUVIAL	ROCK
B-1(R)	13.0	88.2	80.2	0.3(A)	-	2.2	10.5+	-	87.9	85.7	BELOW 75.2
B-2 (R)	18.5	88.2	79.2	0.3(A)	1.7	2.5	14.0+	-	86.2	83.7	BELOW 69.7
B-3(R)	14.0	89.1	79.6	0.3(A)	1.7	2.0	10.0+	-	87.1	85.1	BELOW 75.1
B-4(R)	14.0	89.5	79.5	0.3(A)	-	2.2	11.5+	-	89.2	87.0	BELOW 75.5
B-5(R)	11.5	90.3	80.3	0.3(A)	2.7	1.5	7.0+	-	87.3	85.8	BELOW 78.8
B-6(C)	12.0	90.9	NOT DETERMINED	1.0(T)	-	2.0	3.0	6.0+	89.9	87.9	84.9[(1)]
B-7(R)	10.2	90.5	80.5	0.8(T)	-	2.2	7.2+	-	89.7	87.5	BELOW 80.3
B-8(R)	11.2	96.4	DRY	1.0(FM)	-	3.0	7.2+	-	95.4	92.4	BELOW 85.2
B-9	15.2	89.3	85.3	0.8(FM)	-	1.7	10.0	2.7+	88.5	86.8	76.8[(1)]
B-10(C)	10.0	99.8	DRY	1.0(FM)	-	4.0	-	5.0+	98.8	-	94.8
B-11(C)	10.0	90.2	DRY	0.3(FM)	-	-	5.7	4.0+	-	89.9	84.2
B-12	13.0	87.8	77.8	0.5(T)	-	1.5	11.0+	-	87.3	85.8	BELOW 74.8
B-13(R)	10.0	91.7	DRY	0.8(T)	-	1.7	7.5+	-	90.9	89.2	BELOW 81.7
B-14(C)	12.0	96.9	DRY	0.8(FM)	-	0.7	3.5	7.0+	96.1	95.4	91.9[(1)]
B-15(C)	11.0	92.7	DRY	1.0(T)	-	2.0	6.0	2.0+	91.7	89.7	83.7
C-1	5.0	86.6	DRY	0.3(A)	1.7	1.5	1.5+	-	84.6	83.1	-
C-2	4.0	86.4	DRY	0.3(A)	1.2	-	2.5+	-	-	84.9	-

(R) – Test boring refusal
(C) – Cored bedrock

[(1)] top 1 to 2 ft. of rock is weathered

NOTES:

1. Refer to Drawing 2 for locations of test borings.
2. Elevations are in feet and refer to NAVD 1988 Datum.

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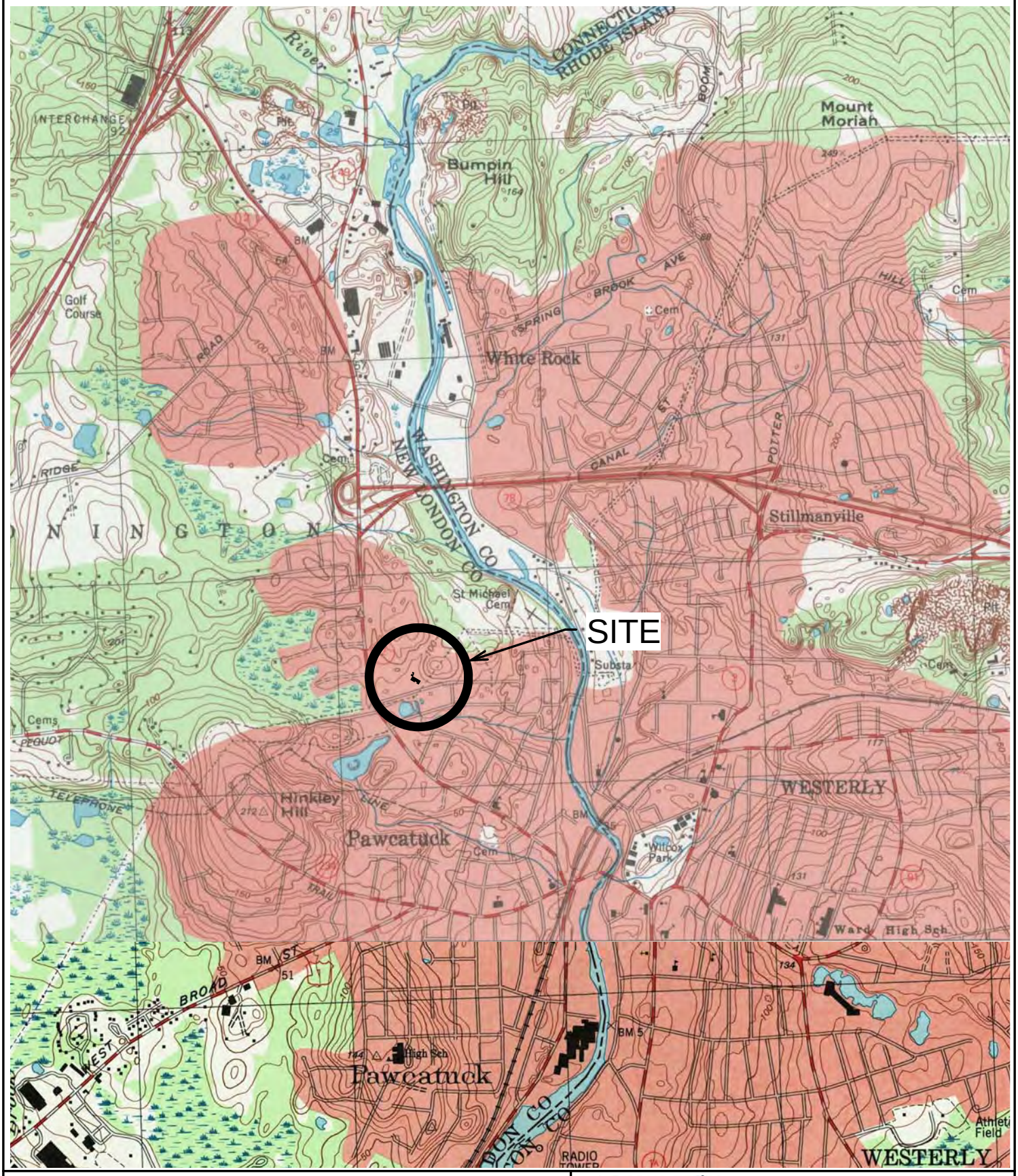
Consulting Engineers, P.C.

Drawings

1- Project Locus
2- Test Boring Plan
3- Summary of Pavement Cores
4- Limits of Compacted Structural Fill Below Footings

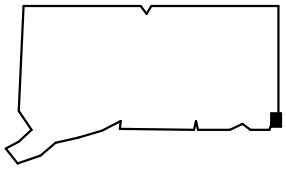


N

W E

S

SITE COORDINATES: 41° 23' 10"N 71° 50' 31"W



U.S.G.S QUADRANGLE: WATCH HILL, RI

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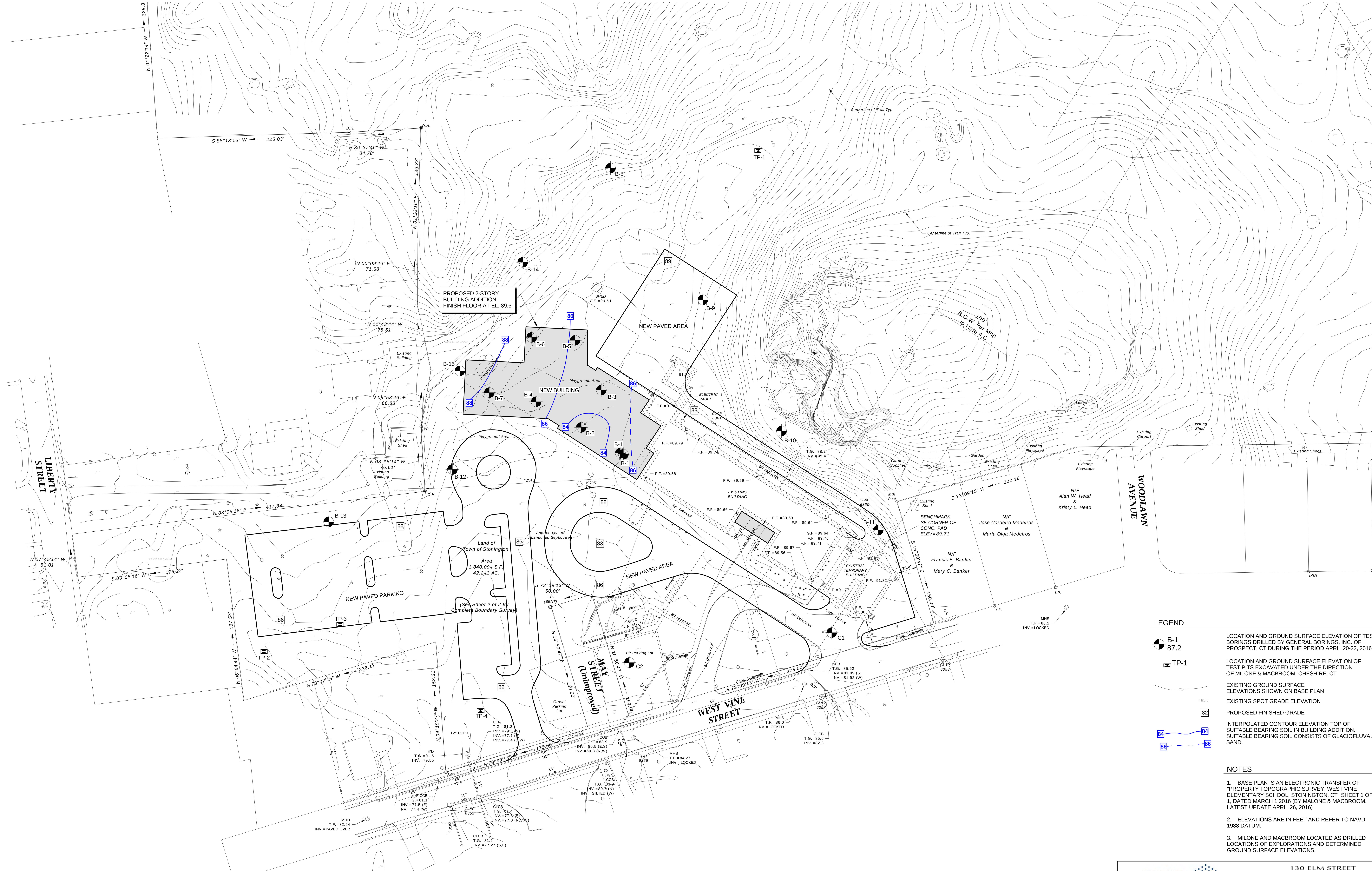
WEST VINE SCHOOL

17 WEST VINE STREET, STONINGTON, CT

PROJECT LOCUS

1" = 2,000 FT.

MAY 2016



LEGEND

B-1 87.2	LOCATION AND GROUND SURFACE ELEVATION OF TEST BORINGS DRILLED BY GENERAL BORINGS, INC. OF PROSPECT, CT DURING THE PERIOD APRIL 20-22, 2016.
TP-1	LOCATION AND GROUND SURFACE ELEVATION OF TEST PITS EXCAVATED UNDER THE DIRECTION OF MILONE & MACBROOM, CHESHIRE, CT
	EXISTING GROUND SURFACE ELEVATIONS SHOWN ON BASE PLAN
	EXISTING SPOT GRADE ELEVATION
82	PROPOSED FINISHED GRADE
84 — 84 / 86 - - 86	INTERPOLATED CONTOUR ELEVATION TOP OF SUITABLE BEARING SOIL IN BUILDING ADDITION. SUITABLE BEARING SOIL CONSISTS OF GLACIOFLUVAL SAND.

NOTES

1. BASE PLAN IS AN ELECTRONIC TRANSFER OF "PROPERTY TOPOGRAPHIC SURVEY, WEST VINE ELEMENTARY SCHOOL, STONINGTON, CT" SHEET 1 OF 1, DATED MARCH 1 2016 (BY MALONE & MACBROOM. LATEST UPDATE APRIL 26, 2016)

2. ELEVATIONS ARE IN FEET AND REFER TO NAVD 1988 DATUM.

3. MILONE AND MACBROOM LOCATED AS DRILLED LOCATIONS OF EXPLORATIONS AND DETERMINED GROUND SURFACE ELEVATIONS.

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0 50' 100' 150'
GRAPHIC SCALE: 1" = 50'

PROJECT NORTH

WEST VINE SCHOOL
17 WEST VINE STREET, STONINGTON, CT

TEST BORING PLAN

SCALE: 1" = 50'-0"

MAY 2016

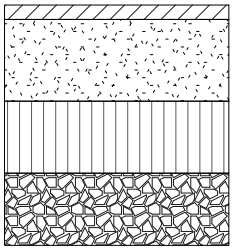
DRAWING 2

C:\Users\GNCB02B\Documents\Local Revit\16051.09 Stonington K WEST VINE\16051.09 S15 West Vine - Local.rvt

SUMMARY OF PAVEMENT CORES

CORE 1

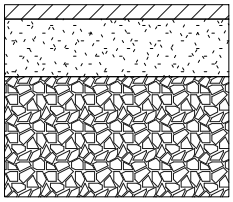
DEPTH (FT.) FROM	TO	DEPOSIT	DESCRIPTION
0 -	0.3	ASPHALT	
0.3 -	2.0	FILL	BROWN GRAVELLY MEDIUM TO FINE SAND, TRACE SILT
2.0 -	3.5	SUB SOIL	YELLOW-BROWN GRAVELLY COARSE TO FINE SAND, LITTLE SILT
3.5 -	5.0	GLACIAL FLUVIAL	GRAY-BROWN SANDY GRAVEL, TRACE SILT



BOE AT 5.0 FT.

CORE 2

DEPTH (FT.) FROM	TO	DEPOSIT	DESCRIPTION
0 -	0.3	ASPHALT	
0.3 -	1.5	FILL	BROWN GRAVELLY COARSE TO FINE SAND, LITTLE SILT
1.5 -	4.0	GLACIAL FLUVIAL	GRAY-BROWN SANDY GRAVEL, LITTLE SILT



BOE AT 4.0 FT.

NOTES:

1. REFER TO DRAWING 2 FOR LOCATION OF PAVEMENT CORES.
2. REFER TO APPENDIX B FOR RESULTS OF LABORATORY SOIL TEST.
3. MAJOR SOIL CONSTITUENT IS UNDERLINED.

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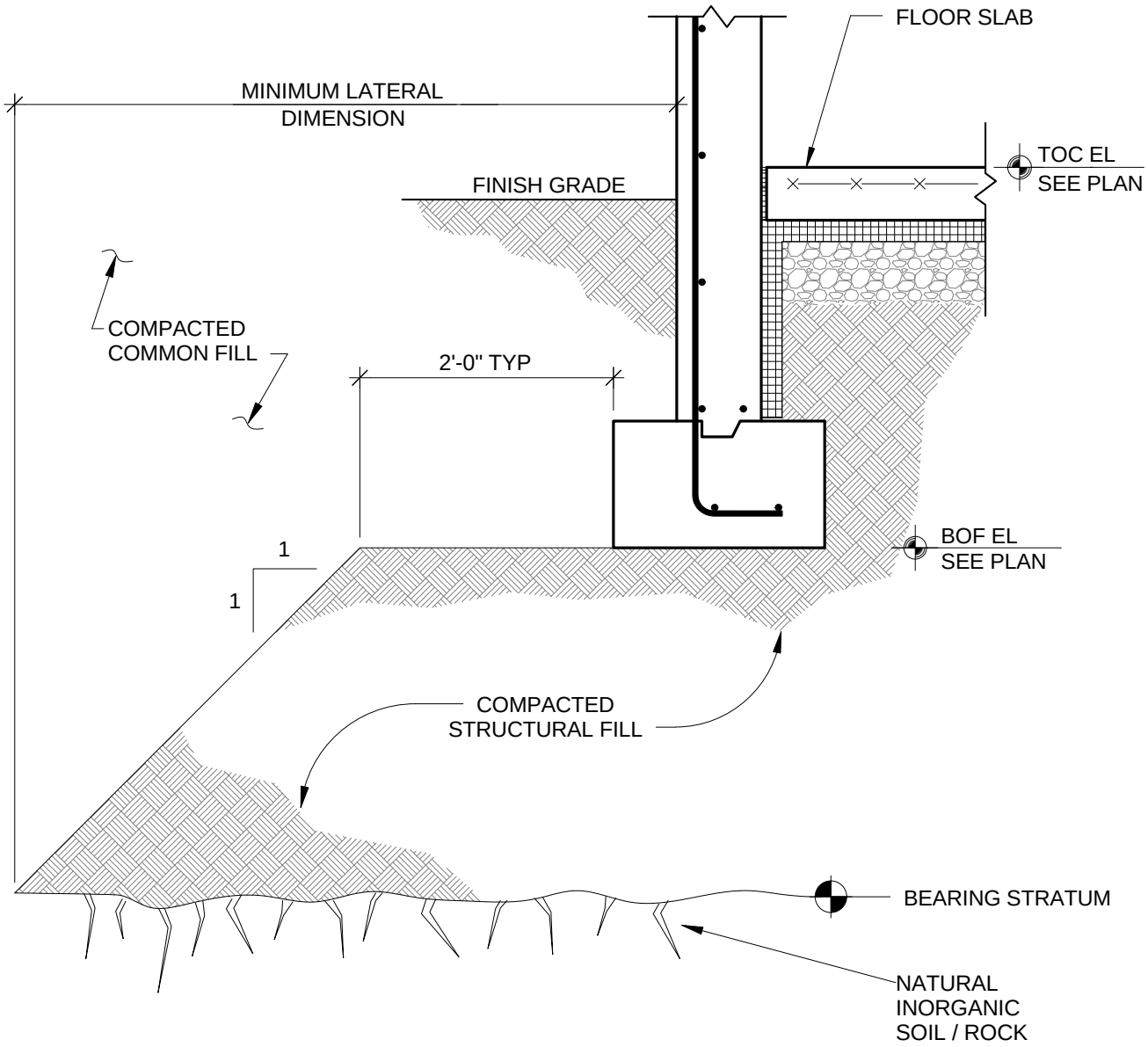
WEST VINE SCHOOL
17 WEST VINE STREET, STONINGTON, CT

SUMMARY OF PAVEMENT CORES

SCALE: 1/4" = 1'-0" MAY 2016



TYPICAL EXTERIOR WALL

1 LIMITS OF COMPACTED STRUCTURAL FILL BELOW FOOTINGS

3/4" = 1'-0"

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WEST VINE SCHOOL
17 WEST VINE STREET, STONINGTON, CT

LIMITS OF COMPACTED STRUCTURAL FILL BELOW FOOTINGS

SCALE: 3/4" = 1'-0" MAY 2016

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Appendix A

Test Boring Logs (B-1 to B-15, C-1 and C-2)

SHEET 1 OF 1

CLIENT: GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER: John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 88.2

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	
Date Started: 4/22/16		H Auger		HA	S . S.		**Hole No.** B-1
Date Finished: 4/22/16							Line & Station
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"		Offset L R
AT 8.0 AFTER 0.0 HRS	Hammer				140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall				30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	3" Asphalt
		1.0-3.0	1	24	12	S	4	6	3	3		1) Loose-Orange-brown fine SAND and SILT.
		3.0-5.0	2	20	18	SS	15	24	38	20/2"		2) Very dense-Brown fine-coarse
5		5.0-5.0	3	0	0	SS	30/0"				GLACIO FLUVIAL	SAND and fine-medium GRAVEL,. trace silt. Boulders 4.0'-6.0'; moved to B-1A and augered to 10.0'
10		10.0-12.0	4	24	20	SS	4	12	21	56		4) Dense-Olive-brown fine-medium SAND and GRAVEL, trace some silt.
15											13.0' EOB	Augered through numerous boulders from 11.0' to 13.0' HSA Refusal at 13.0'
												END OF BORING 13.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 13 Feet in Rock 0 No. of Samples 4 **Hole No.** B-1

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT: GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER: John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 88.2

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	Hole No. B-2
Date Started: 4/21/16		H Auger		HA	S . S.		Line & Station
Date Finished: 4/21/16	Size I. D.			3-1/4"	1-3/8"		Offset L R
Groundwater Observations	Hammer				140 LBS.	Bit	N Coordinate
AT 9.0 AFTER 0.0 HRS	Fall				30"		E. Coordinate
AT AFTER HRS							

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	4" Asphalt
		1.0-3.0	1	24	12	SS	4	11	10	4	2.0' FILL	1) Medium- Dark brown fine-medium
											SUBSOIL	SAND and GRAVEL, some trace silt.
		3.0-5.0	2	24	18	SS	3	2	4	15	4.5'	2) Top 15" Loose-Brown-orange fine
5												SAND and SILT.
		5.0-5.7	3	8	8	SS	13	50/2				3) Very dense-Brown fine-coarse
												SAND and GRAVEL.
10											GLACIO	
		10.0-12.0	4	24	10	SS	21	15	22	24	FLUVIAL	4) Dense-Brown fine-medium SAND
												and GRAVEL in tip.
15												
		15.0-17.0	5	24	12	SS	11	4	9	12		5) Medium-Gray fine-coarse SAND
												and fine-medium GRAVEL.
											18.5'	Auger refused at 18.5'
											EOB	END OF BORING 18.5'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 18.5 Feet in Rock 0 No. of Samples 5 **Hole No.** B-2

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
Robert Poynton

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 89.1

GBI JOB NO. 92-16

Date Started: 4/19/16	TYPE	S Auger	Casing	Sampler	Core Bar
Date Finished: 4/19/16		H Auger	HA	S . S.	
Groundwater Observations	Size I. D.		3-1/4"	1-3/8"	
AT 9.5' AFTER 0.0 HRS	Hammer			140 LBS.	Bit
AT AFTER HRS	Fall			30"	

Hole No. B-3

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	4" Asphalt
		1.0-3.0	1	24	16	SS	13	15	9	7	2.0'	1) Medium-Dark gray fine-medium SAND, and fine-medium GRAVEL,
											SUBSOIL	
		3.0-5.0	2	24	16	SS	5	5	18	25	4.0'	trace silt. (FILL)
5												2) Top 8" Yellow-brown silty fine SAND.
		5.0-5.9	3	10	10	SS	16	50/4				
											GLACIO	2) Bottom 8"-Brown fine-medium SAND,
											FLUVIAL	and fine-medium GRAVEL, trace silt.
												3) Very dense-Brown fine-coarse
10												SAND, and coarse gravel, some gray
		10.0-12.0	4	24	18	SS	8	9	10	13		fine sand.
												4) Medium-Gray fine-coarse SAND and
												fine-medium GRAVEL, some silt.
											14.0'	Auger refused at 14.0'
15											EOB	END OF BORING 14.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 14 Feet in Rock 0 No. of Samples 4 **Hole No.** B-3

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
Robert Poynton

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 89.5

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-4
Date Started: 4/19/16		H Auger		HA	S . S.		Line & Station
Date Finished: 4/19/16	Size I. D.			3-1/4"	1-3/8"		Offset L R
Groundwater Observations	Hammer				140 LBS.	Bit	N Coordinate
AT 10.0 AFTER 0.0 HRS	Fall				30"		E. Coordinate
AT AFTER HRS							

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	4" ASPHALT
		1.0-3.0	1	24	14	SS	3	5	6	7	SUBSOIL 2.5'	1) Top 10" -Medium-Yellow-brown fine-sandy SILT.
		3.0-4.5	2	18	6	SS	22	15	20		GLACIO FLUVIAL	1) Bottom 4" Brown fine-coarse SAND and fine-medium GRAVEL.
5												
		5.0-54	3	5	0	SS	50/5					2) Dense-Brown fine-medium SAND and fine-medium GRAVEL.
												3) No recovery
10												
		10.0-11.4	4	16	12	SS	17	19	50/4			4) Very dense-Light gray silty fine SAND and fine GRAVEL, some silt.
											14.0'	Auger refused at 14.0'
15											EOB	END OF BORING 14.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 14 Feet in Rock 0 No. of Samples 4 **Hole No.** B-4

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT: GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER: John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 90.3

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	
Date Started: 4/21/16		H Auger		HA	S . S.		**Hole No.** B-5
Date Finished: 4/21/16							Line & Station
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"		Offset L R
AT 10.0 AFTER 0.0 HRS	Hammer				140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall				30"		E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	4" Asphalt
		1.0-3.0	1	24	6	SS	6	10	9	8	FILL	1) Medium-Brown fine-medium SAND,
											3.0'	some fine-medium gravel, some silt.
		3.0-5.0	2	24	18	SS	8	5	5	18	4.0'	2) Medium-Light brown fine SAND and
5												SILT, trace fine gravel. (SUBSOIL)
		5.0-7.0	3	24	18	SS	16	20	19	21		3) Dense-Brown fine-coarse SAND
												and fine-medium GRAVEL.
											GLACIO	
											FLUVIAL	
10												
		10.0-10.7	4	8	8	SS	13	50/2			11.5'	4) Very dense-Same as S-3
											EOB	Auger refused at 11.5'
												END OF BORING 11.5'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 11.5 Feet in Rock 0 No. of Samples 4 **Hole No.** B-5

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT: GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER: John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 90.9

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-6
Date Started: 4/21/16		H Auger		HA	S . S.	NQ	Line & Station
Date Finished: 4/21/16	Size I. D.			3-1/4"	1-3/8"	2-1/8"	Offset L R
Groundwater Observations	Hammer				140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall				30"	Diamond	E. Coordinate
AT AFTER HRS							

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	20	SS	2	3	7	10	1.0'	12" Topsoil
											SUBSOIL	1) Medium-Orange-brown fine sandy
		2.0-4.0	2	24	24	SS	6	9	9	11	3.0'	SILT.
											GLACIO	2) Medium-Light brown fine-medium
5		4.0-5.0	3	12	12	SS	18	50			FLUVIAL	SAND and fine-medium GRAVEL,
											6.0	trace silt.
								MIN/FT			WR 7.0'	3) Very dense-Gray medium-coarse
										2		SAND and coarse GRAVEL, some
										2	ROCK	fine gravel, trace silt.
10										3		
										3		Run#1-Cored Granite Rock 7.0'-12.0'
		7.0-12.0	1	60	58	C				3	12.0'	Recovered 58" QUARTZ; RQD 44"
											EOB	END OF BORING 12.0'
15												Note: Augered from 6.0' to 7.0' in weathered rock.
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 7 Feet in Rock 5 No. of Samples 3 **Hole No.** B-6

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
Robert Poynton

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 90.5

GBI JOB NO. 92-16

Date Started: 4/19/16	TYPE	S Auger		Casing	Sampler	Core Bar
Date Finished: 4/19/16		H Auger		HA	S . S.	
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"	
AT 10.0 AFTER 0.0 HRS	Hammer				140 LBS.	Bit
AT AFTER HRS	Fall				30"	

Hole No. B-7

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	18	SS	3	6	7	13	.8'	8" Topsoil
											SUBSOIL	1) Medium-Light brown fine SAND and
		2.0-4.0	2	24	16	SS	11	13	22	33	3.0'	SILT, little fine gravel.
5												2) Dense-Light brown fine-coarse SAND and fine-medium GRAVEL.
		5.0-6.5	3	18	14	SS	20	27	32		GLACIO FLUVIAL	3) Very dense-Gray-brown medium-coarse SAND and coarse GRAVEL, trace brown fine sand.
10											10.2'	
		10.0-10.2	4	2	2	SS	50/2				EOB	4) Very dense-Gray-brown fine-medium SAND and fine-medium GRAVEL. Auger refused at 10.2'
15												END OF BORING 10.2'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 10.2 Feet in Rock 0 No. of Samples 4 **Hole No.** B-7

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
James Casson

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 96.4

GBI JOB NO. 92-16

Date Started: 4/21/16	TYPE	S Auger	Casing	Sampler	Core Bar	**Hole No.** B-8
Date Finished: 4/21/16		H Auger	HA	S . S.	NQ	Line & Station
Groundwater Observations	Size I. D.		3-1/4"	1-3/8"	2-1/8"	Offset L R
AT Dry AFTER 0.0 HRS	Hammer			140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall			30"	Diamond	E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	8	SS	2	1	1	1	1.0'	1) Very loose-Dark brown FOREST
											SUBSOIL	MAT AND ROOTS
		2.0-4.0	2	24	22	SS	2	2	3	4		2) Loose-Light brown fine-medium
											4.0'	SAND, little silt to silty fine sand.
5											GLACIO	
		5.0-7.0	3	24	16	SS	3	8	13	13	FLUVIAL	3) Medium--Light brown fine sandy
												SILT, trace roots, fine gravel.
											8.5'	Hollow auger refused at 8.5'
										2.5		Run#1-Cored Boulder 8.5'-10.05'
10		8.5-10.5	1	24	20	C				3		Recovered 20"
		10.5-11.3	4	9	2	SS	39	50/3			11.3'	4) Very dense-Fractured BOULDER
											EOB	and weathered ROCK.
												END OF BORING 11.3'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 11.3 Feet in Rock 0 No. of Samples 4 **Hole No.** B-8

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
James Casson

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 89.3

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-9
Date Started: 4/21/16		H Auger		HA	S . S.		Line & Station
Date Finished: 4/21/16	Size I. D.			3-1/4"	1-3/8"		Offset L R
Groundwater Observations	Hammer				140 LBS.	Bit	N Coordinate
AT 5.0 AFTER 0.0 HRS	Fall				30"		E. Coordinate
AT AFTER HRS							

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	20	SS	2	3	3	3	.8'	10" FOREST MAT
											2.5'	1) Loose-Yellow-brown silty fine
		2.0-4.0	2	24	20	SS	3	5	7	6		SAND. (SUBSOIL)
												2) Medium-Same as above, bottom 2"
5											GLACIO	fine sand, little silt.
		5.0-7.0	3	24	19	SS	7	9	11	10	FLUVIAL	3) Medium-Top 6" Brown fine-medium
												SAND, little silt, coarse sand.
												Bottom 8" Brown coarse-fine SAND,
												trace fine gravel.
10												
		10.0-10.3	4	15	14	SS	5	7	50/3			4) Very dense-Brown silty fine SAND.
											12.5'	Bottom 2" Silty coarse-fine SAND,
											ROCK	little gravel.
												Hard drilling from 11.0'
15											15.2'	
		15.0-15.2	5	2	2	SS	50/2				EOB	5) Very dense-Weathered ROCK.
												END OF BORING 15.2'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 15.2 Feet in Rock 0 No. of Samples 5 **Hole No.** B-9

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
James Casson

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 99.8

GBI JOB NO. 92-16

Date Started: 4/21/16	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-10
Date Finished: 4/21/16		H Auger		HA	S . S.	NQ	Line & Station
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"	2-1/8"	Offset L R
AT 3.0 AFTER 0.0 HRS	Hammer				140 LBS.	Bit	N Coordinate
Core Water AFTER HRS	Fall				30"	Diamond	E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	10	SS	3	2	1	3	1.0'	12" FOREST MAT
		2.0-4.0	2	24	16	SS	2	1	1	2	SUBSOIL	1) Very soft-Light brown sandy SILT, trace roots.
5		5.0-5.0	3	0	0	SS	50/0"	MIN/FT			5.0'	2) Very soft-Light brown fine sandy SILT, trace roots.
										2.5		3) No recovery
										2.5		
										2	ROCK	Run#1-Cored pink Granite Rock
										3		5.0'-10.0' Recovered 60" GRANITE.
10		5.0-10.0	1	60	60	C				2.5	10.0'	RQD=53"
											EOB	END OF BORING 10.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 5 Feet in Rock 5 No. of Samples 3 **Hole No.** B-10

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 90.2

GBI JOB NO. 92-16

Date Started: 4/22/16	TYPE	S Auger		Casing	Sampler	Core Bar
Date Finished: 4/22/16		H Auger		HA	S . S.	nq
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"	2-1/8"
AT Dry AFTER 0.0 HRS	Hammer				140 LBS.	Bit
AT AFTER HRS	Fall				30"	Diamond

Hole No. B-11

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	12	SS	2	4	5	7	.3'	4" FOREST MAT
		2.0-3.4	2	17	14	SS	9	13	50/5		GLACIO FLUVIAL	1) Loose-Brown fine SAND and SILT. 2) Very dense-Light brown fine SAND, trace silt,
5									MIN/FT		6.0'	
										2	ROCK	Run#1-Cored GNEISS Rock 6.0'-10.0'
										2		Recovered 42"
										2		RQD=0"
10		6.0-10.0	1	48	42	C				2	10.0'	
											EOB	END OF BORING 10.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 6 Feet in Rock 4 No. of Samples 2 **Hole No.** B-11

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: John Wyant

INSPECTOR: Garry Jacobson

Surface Elevation: 87.8

Date Started: 4/22/16

Date Finished: 4/22/16

Groundwater Observations

AT 16.0 AFTER 0.0 HRS

AT 10.0 AFTER 0.5 HRS

PROJECT NAME: Stonington K-12

LOCATION: West Vine School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. B-12

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	18	SS	4	4	4	10	.5'	6" Topsoil
											2.0'	1) Loose-Brown fine SAND and SILT. (SUBSOIL)
		2.0-4.0	2	24	14	SS	16	19	10	9		
5											GLACIO	2) Dense-Brown fine-coarse SAND and fine-medium GRAVEL.
		5.0-7.0	3	24	10	SS	11	17	13	15	FLUVIAL	3) Medium-Brown fine-medium SAND and GRAVEL.
10		10.0-10.0	4	0	0	SS	50/0"					4) No recovery
		11.0-13.0	5	24	14	SS	8	10	4	10		5) Medium-Brown fine-medium SAND and GRAVEL, trace silt.
											13.0'	
15											EOB	END OF BORING 13.0'
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 13 Feet in Rock 0 No. of Samples 5 **Hole No.** B-12

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT: GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER: John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 91.7

GBI JOB NO. 92-16

Date Started: 4/21/16	TYPE	S Auger		Casing	Sampler	Core Bar
Date Finished: 4/21/16		H Auger		HA	S . S.	
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"	
AT Dry AFTER 0.0 HRS	Hammer				140 LBS.	Bit
AT AFTER HRS	Fall				30"	

Hole No. B-13

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	18	SS	2	3	2	3	.7'	8" Topsoil
											2.5'	1) Loose-Light brown fine-medium SAND, some silt. (SUBSOIL)
		2.0-4.0	2	24	18	SS	4	5	4	4		
5											GLACIO	2) Loose-Light brown fine SAND, some silt.
		5.0-7.0	3	24	14	SS	14	27	37	42	FLUVIAL	3) Very dense-Brown fine SAND and SILT.
												Bottom-Brown fine-coarse SAND and fine-medium GRAVEL.
10											10.0'	Augered hard starting at 9.8 ft.
		10.0-10.0	4	0	0	SS	50/0				EOB	Split spoon refused at 10.0'
												4) COBBLE.
												END OF BORING 10.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 10 Feet in Rock 0 No. of Samples 3 **Hole No.** B-13

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.
P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
Robert Poynton

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 96.9

GBI JOB NO. 92-16

Date Started: 4/19/16	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-14
Date Finished: 4/19/16		H Auger		HA	S . S.	NQ	Line & Station
Groundwater Observations	Size I. D.			3-1/4"	1-3/8"	2-1/8"	Offset L R
AT Dry AFTER 0.0 HRS	Hammer				140 LBS.	Bit	N Coordinate
AT AFTER HRS	Fall				30"	Diamond	E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-.7	1	8	14	SS	3	5	13	20/2	.8'	9" FOREST MAT
											1.5'	SUBSOIL
											GLACIO	Augered through numerous cobbles
											FLUVIAL	and boulders from 1.0' to 5.0'
5											5.0'	Unable to sample at 5.0'
											WR	Possible weathered rock at 5.0'
								MIN/FT			7.0'	Refusal at 7.0
										4		
										4		Run#1-Cored Rock 7.0'-12.0'
10										5	ROCK	
										5		
		7.0-12.0	1	60		C				6	12.0'	
											EOB	END OF BORING 12.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 7 Feet in Rock 5 No. of Samples 1 **Hole No.** B-14

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

CLIENT:
GNCB Consulting Engineers, P.C.

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

FOREMAN/DRILLER:
John Wyant

SOIL ENGINEER

PROJECT NAME: Stonington K-12

INSPECTOR: Garry Jacobson

LOCATION: West Vine School, Stonington, CT

DESIGN ENGINEER

Surface Elevation: 92.7

GBI JOB NO. 92-16

	TYPE	S Auger		Casing	Sampler	Core Bar	**Hole No.** B-15
Date Started: 4/21/16		H Auger		HA	S . S.		Line & Station
Date Finished: 4/21/16	Size I. D.			3-1/4"	1-3/8"		Offset L R
Groundwater Observations	Hammer				140 LBS.	Bit	N Coordinate
AT Dry AFTER 0.0 HRS	Fall				30"		E. Coordinate
AT AFTER HRS							

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		0-2.0	1	24	14	SS	2	6	4	4	1.0'	12" Topsoil
											SUBSOIL	1) Medium-Orange-brown fine-medium
		2.0-4.0	2	24	20	SS	4	5	6	7	3.0'	SAND and SILT, ROOTS.
											GLACIO	2) Medium-Light brown fine-medium
5												SAND, trace silt.
		5.0-6.3	3	20	14	SS	8	10	24	30/2	FLUVIAL	3) Dense-Brown fine-coarse SAND
												and GRAVEL.
								MIN/FT			9.0'	
10		9.0-11.0	1	24	19	C				4	ROCK	Cored pink GRANITE from 9.0'-11.0'
										4	11.0'	plugged, Recovered 19" RQD 0"
											EOB	END OF BORING 11.0'
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 11 Feet in Rock 0 No. of Samples 3 **Hole No.** B-15

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: John Wyant

INSPECTOR: Garry Jacobson

Surface Elevation: 86.6

Date Started: 4/22/16

Date Finished: 4/22/16

Groundwater Observations

AT Dry AFTER 0.0 HRS

AT AFTER HRS

PROJECT NAME: Stonington K-12

LOCATION: West Vine School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. C-1

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	4" Asphalt
		1.0-3.0	1	24	10	SS	17	12	4	6	2.0'	1) Medium-Brown gravelly medium-fine SAND, trace silt. (FILL)
											3.5'	
		3.0-5.0	2	24	18	SS	8	17	27	35		1) Bottom 4" Yellow-brown gravelly
5											5.0'	SAND, little silt. (SUBSOIL)
											EOB	2) Dense-Brown gravelly fine-coarse SAND.
												END OF BORING 5.0'
10												
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 5 Feet in Rock 0 No. of Samples 2 **Hole No.** C-1

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

SHEET 1 OF 1

General Borings, Inc.

P. O. BOX 7135 PROSPECT, CT 06712

CLIENT: GNCB Consulting Engineers, P.C.

FOREMAN/DRILLER: John Wyant

INSPECTOR: Garry Jacobson

Surface Elevation: 86.4

Date Started: 4/22/16

Date Finished: 4/22/16

Groundwater Observations

AT Dry AFTER 0.0 HRS

AT AFTER HRS

PROJECT NAME: Stonington K-12

LOCATION: West Vine School, Stonington, CT

GBI JOB NO. 92-16

SOIL ENGINEER

DESIGN ENGINEER

TYPE	S Auger		Casing	Sampler	Core Bar
	H Auger		HA	S . S.	
Size I. D.			3-1/4"	1-3/8"	
Hammer				140 LBS.	Bit
Fall				30"	

Hole No. C-2

Line & Station

Offset L R

N Coordinate

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE DEPTH IN FEET FROM - TO	NO.	PEN. IN	REC. IN	TYPE	BLOWS PER 6 INCHES ON SAMPLER 0-6	6-12	12 18	18 24	STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
											.3'	4" Asphalt
		1.0-3.0	1	24		SS	13	25	26	28	1.5'	1) Dense-Brown fine SAND and GRAVEL, some silt. (FILL)
		3.0-4.0	2	12		SS	12	30	20/0"		4.0'	2) Very dense-Gray-brwon sandy
5											EOB	GRAVEL, little silt.
												END OF BORING 4.0'
10												
15												
20												
25												
30												
35												
40												

From Ground Surface to Feet Used in. Casing Then in. Casing For Feet

Feet in Earth 4 Feet in Rock 0 No. of Samples 2 **Hole No.** C-2

SAMPLE TYPE CODING: SS = DRIVEN C = CORE A = AUGER U = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

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Appendix B

Grain Size Distribution Plots

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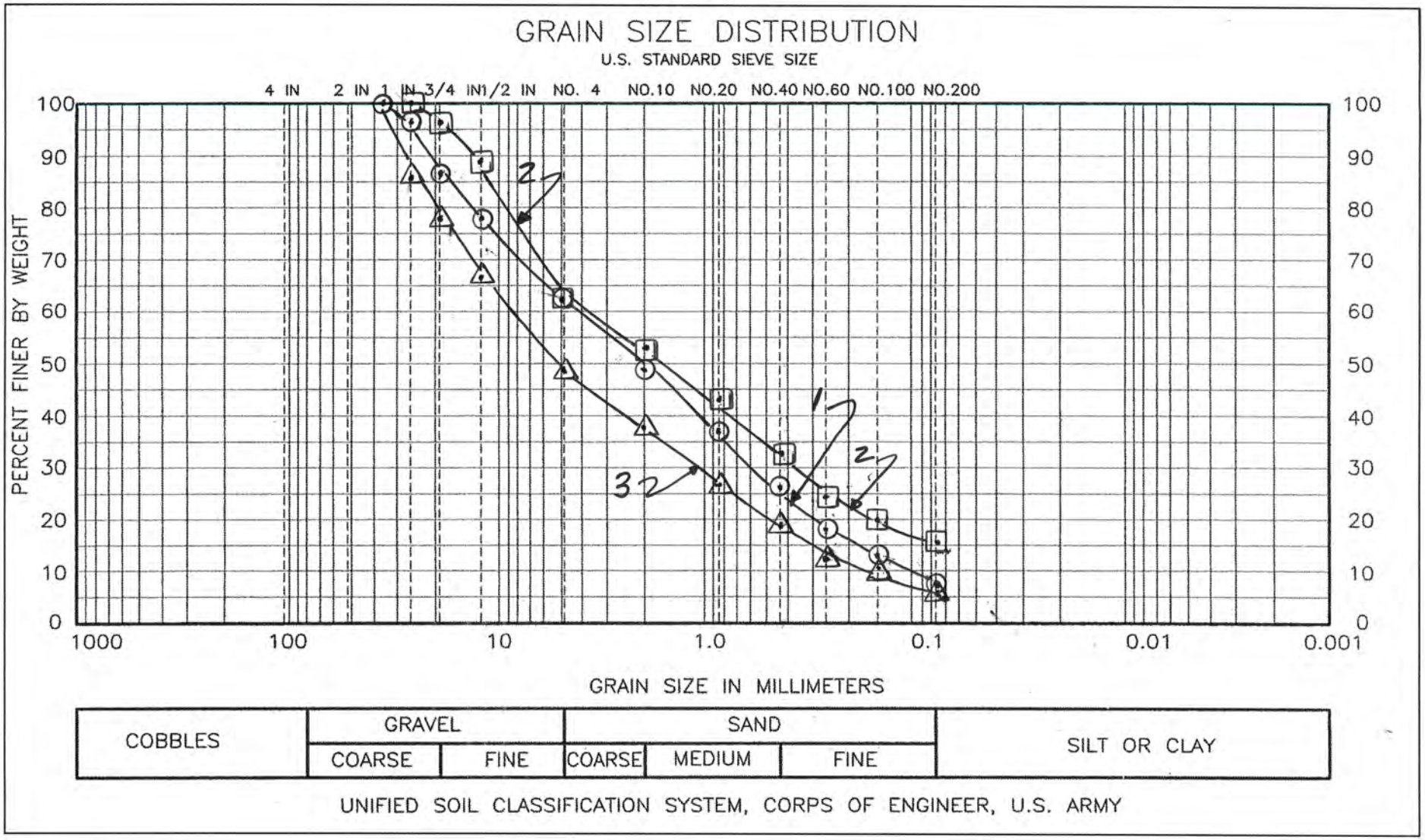
GRAIN SIZE DISTRIBUTION



TEST NO.	CORE NO.	DEPTH (FT.)	WATER CONTENT (%)	DESCRIPTION
1	C1	0.3 – 2.0	3.6	Brown gravelly medium to fine SAND, trace silt.
2	C1	2.0 – 3.5	17.1	Yellow brown gravelly coarse to fine SAND, little silt.
3	C1	3.5 – 5.0	4.3	Gray brown sandy GRAVEL, trace silt.

PROJECT NO. 16051.09 DATE: May 16

West Vine School

FORM G-101 (MAY 2014)

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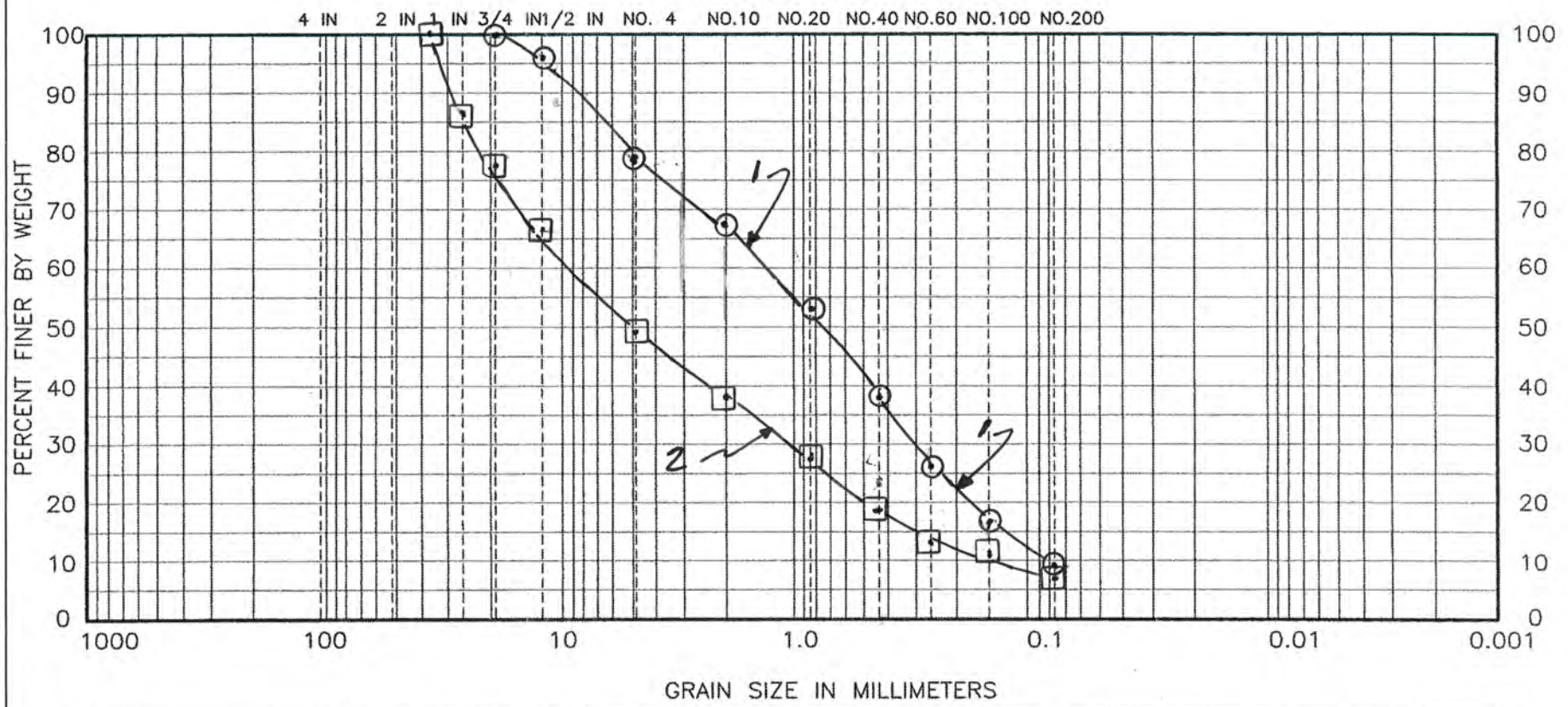
GRAIN SIZE DISTRIBUTION



UNIFIED SOIL CLASSIFICATION SYSTEM, CORPS OF ENGINEER, U.S. ARMY

TEST NO.	CORE NO.	DEPTH (FT.)	WATER CONTENT (%)	DESCRIPTION
1	C2	0.3 – 1.5	8.1	Brown gravelly coarse to fine SAND, little silt.
2	C2	1.5 – 4.0	2.8	Gray-brown sandy GRAVEL, little silt.

PROJECT NO. 16051.09 DATE: May 16

West Vine School

FORM G-101 (MAY 2014)

GNCB
Consulting Engineers, P.C.

Appendix C

Technical Provisions of Specifications for Compacted Structural Fill

TECHNICAL PROVISIONS OF SPECIFICATIONS
FOR COMPACTED STRUCTURAL FILL

PART 1 – GENERAL:

1.01 DESCRIPTION OF WORK

The work covered by this specification consists of furnishing all plant, labor, equipment and materials and performing all operations in connection with excavation, preparation of subgrade, and providing, placing and compacting Structural Fill within the building.

1.02 QUALITY ASSURANCE

Monitoring of earthwork operations will be provided by the Owner. Suitable test methods for the Owner's testing laboratory to determine the in-place dry density of the compacted lifts include: ASTM D6938-10 (Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods, ASTM D1556-07 (Standard Test Method for Density and Unit Weight of Soil In Place by the Sand Cone Method), or other methods approved by the Engineer.

The Contractor shall not place a layer of fill until the Owner has observed the underlying materials.

PART 2 – PRODUCTS:

2.01 STRUCTURAL FILL

Structural fill shall be suitable gravel, sandy gravel, or gravelly sand, free of organic material, loam, trash, snow, ice, frozen soil and other objectionable material and shall be well-graded within the following limits:

Sieve Size	Percent Finer by Weight
4 inches	100
No. 4	20 – 80
No. 40	5 – 50
No. 200	0 – 10

Excavated material is not suitable for use as Structural Fill. The inorganic excavated materials may be used as common fill outside the building limits or may be disposed of in accordance with arrangements previously made with the Owner. Organic soil and surplus excavated soil shall be legally disposed of.

All material is subject to approval by the Owner's representative.

PART 3 – EXECUTION:

3.01 SUBGRADE PREPARATION

Remove all topsoil, man-placed fill, subsoil and other unsuitable materials from the area of the building and to lateral limits extended beyond the footings a distance equal to the depth of fill required below the footing plus two feet. Upon completion of the excavation, the soil subgrade shall be compacted by at least six coverages with the treads of a crawler type tractor weighing at least 30,000 pounds, with the rear wheels of a fully loaded ten-wheel dump truck, or by a suitable 10-ton vibratory roller as approved by the Owner. Where, in the opinion of the Owner, compaction of the subgrade is not desirable, the above compaction requirements will be waived.

3.02 PLACEMENT OF COMPACTED SRUCTURAL FILL

Structural fill shall be placed in layers not to exceed ten inches in thickness as measured before compaction. Each layer shall be compacted by a minimum of four coverages with the equipment described below to a dry density at least 95 percent of maximum dry density as determined by ASTM Test D1557. Incidental compaction due to traffic by construction equipment will not be credited toward the required minimum four coverages.

Compaction equipment in open areas shall consist of vibratory rollers, fully loaded ten-wheel dump trucks, or other compaction equipment approved by the Owner. Compaction equipment in confined areas (in trenches and adjacent to walls, piers and footings) shall consist of hand-guided vibratory equipment or mechanical tampers as approved by the Owner. Layer thickness prior to compaction, shall not exceed nine inches or 6 inches when using hand guided vibratory compactors..

All fill material shall be placed and compacted "in-the-dry". The Contractor shall dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed state of the existing soil subgrade.

The Contractor shall not place a layer of compacted structural fill on snow, ice or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be required as directed by the Owner.
In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.

Compacted fill shall not be placed when temperatures are below freezing.

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Structural Engineering
Geotechnical Engineering
Historic Preservation
Construction Support

September 28, 2016

Town of Stonington
c/o Colliers International
135 New Road
Madison, Connecticut 06443

Attn: Mr. Charles Warrington (email: charles.warrington@colliers.com)

Re: Additional Test Pits, Laboratory Soil Testing, and Analysis of On-site Soils for Re-use as Structural Fill or Common Fill
Proposed Deans Mill School
35 Deans Mill Road, Stonington, Connecticut

Principals
Kenneth Gibble, P.E.
James F. Norden, P.E.
Charles C. Brown, P.E.

Geotechnical Associate
David L. Freed, P.E.

Structural Associate
Richard A. Centola, P.E.

Dear Mr. Warrington:

This letter summarizes the results of additional test pits, laboratory soil testing, and analysis of the on-site soils for reuse as compacted fill associated with the addition to Deans Mill School in Stonington, Connecticut. GNCB recently completed a geotechnical investigation of the school addition, our field work and recommendations are discussed in a May 11, 2016 engineering report (with latest revision dated August 25, 2016). These additional geotechnical engineering services include the collection and soil testing (i.e. water content, grain size/hydrometer analysis and proctor density tests) of the soils expected to be excavated from the site, in order to provide information to bidding contractors to assess reuse of the soils in fill areas. Our work was completed in accordance with our July 19, 2016 proposal, as verbally authorized.

In summary, GNCB observed the excavation of five test pits TP-A through TP-E (refer to the attached Drawing 1 for locations) and collected 16 large sized bag samples of the soils encountered. Ten samples were selected for grain size analysis/hydrometer analysis and five (5) modified proctor density tests. Based on the laboratory and field test pits, it is our opinion that the on-site glacial till soil is a suitable material for reuse as structural fill below buildings or as a common fill below paved and landscaped areas. Our comments follow:

FIELD AND LABORATORY SOIL TESTING

130 Elm Street
P.O. Box 802
Old Saybrook, CT 06475
Tel 860.388.1224
Fax 860.388.4613
lastname@gncbengineers.com
gncbengineers.com

Field Test Pits: GNCB planned and monitored the excavation of five test pits (TP-A through TP-E) for the purpose of collecting soils samples for laboratory soil testing. The test pits were located in areas anticipated to be excavated for the new building addition and site grading. Drawing 1 shows the approximate locations of the test pits. GNCB approximated the test pit locations in the field based on sighting and

taping from existing site features; GNCB also approximated the ground surface elevation at each test pit based on the contours shown on the Drawing 1 base plan. Mad River Construction of Westerly, Rhode Island, under contract to the Town of Stonington, excavated the test pits with a CAT 315B tracked backhoe equipped with a one cubic yard bucket. The test pit depths ranged from 12 to 13 ft.; all the test pits terminated within a naturally-deposited glacial till without encountering bedrock. GNCB collected 16 large bag samples of the soils encountered. In addition, GNCB saved a small representative jar sample of each bag sample for future reference and comparison to the laboratory results. Logs of each of the test pits are attached as Appendix A; Table I summarize the test pit results. The following is a summary of the test pit soils, progressing downward from ground surface:

Thickness (ft.)	General Description
0.5 to 0.8	Loamy fine SAND, trace roots (TOPSOIL/FOREST MAT)
1.5 – 3.5	Yellow-brown fine sandy SILT, little gravel (SUBSOIL)
Up to 11.0	Tan sandy coarse to fine GRAVEL, some to little silt, to a tan gravelly coarse to fine SAND, little silt; at one location (TP-C) a tan gravelly SILT, little sand (GLACIAL TILL)

The test pits did not encounter groundwater.

Laboratory Soil Testing: GNCB selected 10 representative soil samples encountered at the test pits for laboratory soil testing by a NAVLP certified lab, GeoTesting Express of Acton, Massachusetts. The laboratory results are summarized on Table II and graphic plots of the results are contained in Appendix B.

A total of ten (10) natural moisture content (ASTM D2216) and grain size distribution tests and/or hydrometer tests (ASTM D422) were completed on the collected samples. After reviewing the grain size analysis tests, five (5) of the 10 samples were selected for modified proctor density tests (ASTM D1557). Because of similar gradation analysis and insufficient bag sample material, the following samples were combined for the modified proctor testing:

- TP-A/S1, TP-B/S1, and TP-C/S3
- TP-A/S3 and TP-B/S3
- TP-D/S1 and TP-D/S2

DISCUSSION OF FIELD AND LABORATORY RESULTS

The test pit excavations revealed the following significant information regarding reuse of the on-site soils:

- The upper 0.5 to 0.8 ft. consists of an organic topsoil/forest mat.
- Below the topsoil, a 1.5 to 3.5 ft. thick layer of subsoil, composed primarily of a silt and fine sand, existed.

- The major soil unit at the site is a naturally-deposited glacial till that consists mainly of sand and gravel with little to trace amounts of silt; at one location (TP-C), the till contained a layer of gravelly SILT.
- The glacial till contains many cobbles and boulders (up to 24 in. in size), that comprised a volume up to about 15 percent of the total test pit volume.
- The glacial till was easily excavated, except it was somewhat dense with difficult digging at the bottom of TP-D.
- The test pits did not encounter groundwater or bedrock.
- The wooded area that was explored contains numerous surface boulders; one such boulder near TP-D was about 20 ft. by 12 ft. in dimension.

With regard to the laboratory soil testing, the following is significant:

- The natural moisture content of the glacial till is quite narrow, ranging from about 2 percent to 5.5 percent.
- The natural glacial till is a fairly consistent material composed of sand and gravel with little to some silt.
- The range of maximum dry density for the tested glacial till samples, in pounds per cubic foot (pcf), ranged from about 142 pcf for a sample with less than 10 percent material finer than No. 200 sieve (TP-A/S3) to about 131 pcf for a sample with 45 percent material finer than No. 200 sieve (TP-C/S2). The increased amount of material passing the No. 200 sieve (i.e. silt size material) would be expected to lower the maximum dry density.

CONCLUSIONS

In our opinion, the field and laboratory test results supports the conclusion that the main soil type, a naturally-deposited glacial till, is a suitable material for reuse as compacted fill. Furthermore, while the glacial till does not comply with the gradation criteria previously specified in our geotechnical engineering report, the glacial till may be used for this purpose. In addition, the glacial till is suitable for use on the project as a common fill for use below design section of paved parking areas or at landscape areas. We note that the natural moisture content of the glacial till is from 2 to 4 percentage points below its optimum value, as such, water may need to be added to the lifts as placed to achieve the required compaction.

With regard to the subsoil encountered directly below the surface topsoil/forest mat layer, this (subsoil) is not suitable for use as a structural fill below the building structures. However, the subsoil may be used as common fill within paved and landscape areas.

For all the soils encountered (subsoil and glacial till), earthwork contractors will need to adhere to common sense procedures for reusing these soils as compacted fill. Specifically, this includes:

- Separating the soils as they are excavated for reuse as structural fill or common fill.
- It is best practice to reuse and place soils as they are excavated into the fill areas, to eliminate stockpiling and re-handling of soil. Soil that remains in stockpiles can become wet and at some point may be too wet to be successfully used as a compacted fill.

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- If material has to be stockpiled, the top of the pile should be graded to shed water and covered with plastic to prevent infiltration of rainwater.
- The glacial till and subsoil contain a sufficient percent of material passing the No. 200 sieve, such that its moisture content at the time of placement, if more than 2 percent above optimum, will make it difficult, if not impossible to properly compact.

Sincerely yours,

David L. Freed, PE
Geotechnical Associate

Table I – Summary of Test Pits
Table II – Summary of Laboratory Soil Tests
Drawing 1 – Test Pit Plan
Appendix A – Test Pit Logs
Appendix B – Graphic Plots of Laboratory Soil Test Results

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Tables

Table I – Summary of Test Pits
Table II – Summary of Laboratory Soil Tests

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TABLE I

SUMMARY OF TEST PITS

ADDITION TO DEANS MILL SCHOOL
STONINGTON, CONNECTICUT

TEST PIT NO.	DEPTH (FT.)	APPROX. ELEV. GROUND SURFACE (FT.)	THICKNESS SOIL (FT.)			ELEV. TOP GLACIAL TILL (FT.)
			TOPSOIL	SUBSOIL	GLACIAL TILL	
TP-A	12.0	102.0	0.5	3.5	8.5+	98.0
TP-B	13.0	102.0	0.5	1.5	11.0+	100.0
TP-C	12.0	102.0	0.8	2.0 (AVG.)	9.2^{+} (AVG.)	99.2 (AVG.)
TP-D	12.0	93.0	0.8	3.7	7.5^{+}	88.5
TP-E	12.0	90.0	0.8	2.7	8.5^{+}	86.5

Notes:

1. Refer to Drawing 1 for locations of test pits.
2. Elevations are in feet and refer to NAVD 1988 Datum.

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TABLE II

SUMMARY OF LABORATORY SOIL TESTS

ADDITION TO DEANS MILL SCHOOL
STONINGTON, CONNECTICUT

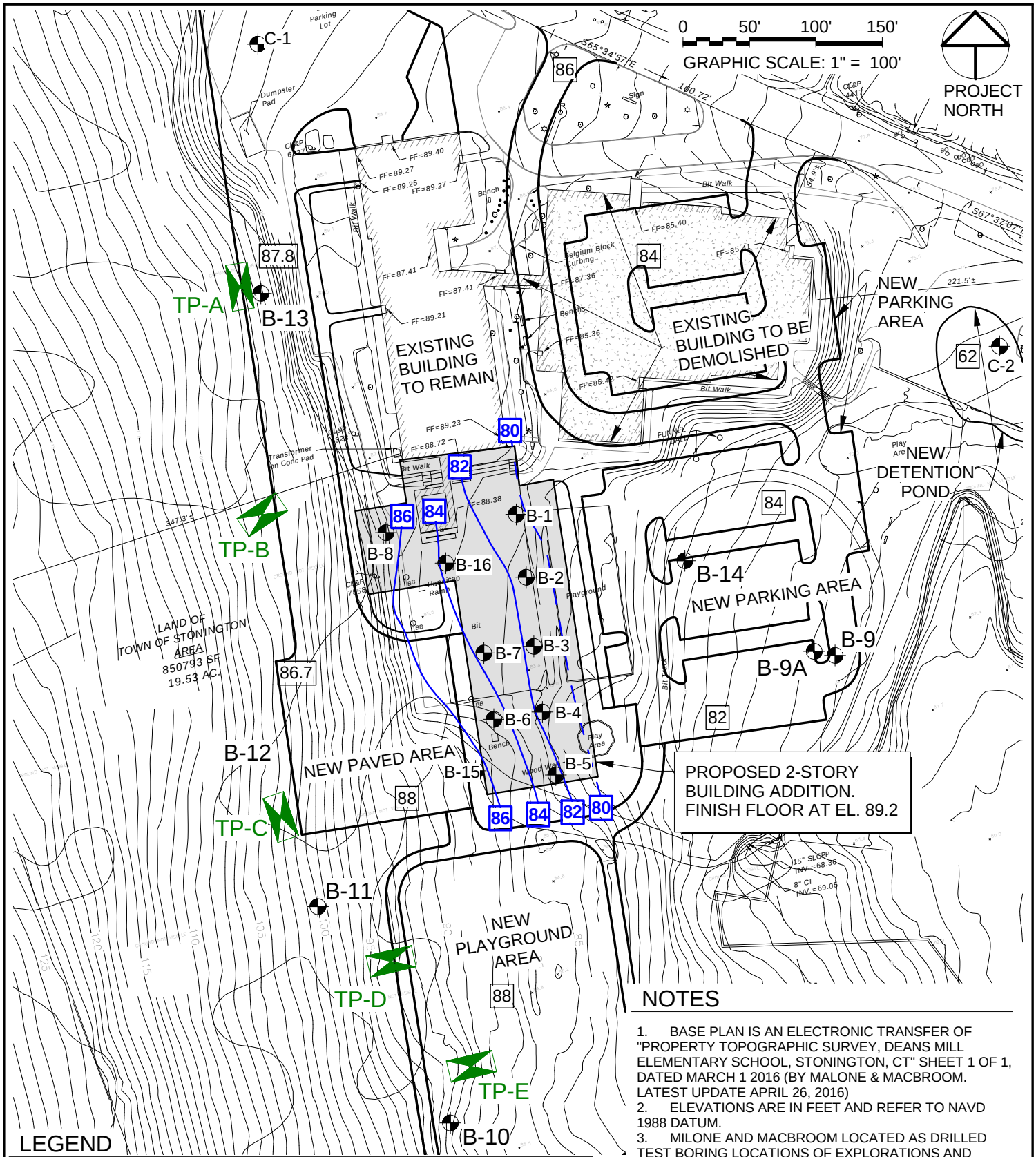
TEST PIT NO.	SAMPLE NO.	DEPTH (FT.)	ELEV. GROUND SURFACE (FT.)	NATURAL MOISTURE CONTENT (5)	GRAIN SIZE (mm)			PROCTOR DENSITY		DESCRIPTION
					D_{10}	D_{50}	D_{85}	OPTIMUM MOISTURE (%)	MAX DRY UNIT WEIGHT (PCF)	
TP-A	S1	4-6	102	4.1	-	0.9	17.8	138.0	5.1	Gravelly coarse to fine SAND, little silt
	S3	10-12	102	1.4	0.1	11.6	79.4	142.9	6.8	Sandy coarse to fine GRAVEL, trace silt
TP-B	S1	4-6	102	1.2	0.0	0.7	56.6	See TP-A/S1		Sandy coarse to fine GRAVEL, some silt
	S3	10-12	102	2.0	0.1	6.3	62.3	See TP-A/S3		Sandy coarse to fine GRAVEL, trace silt
TP-C	S2	5-7	102	5.1	0.0	0.1	22.7	131.1	7.1	Gravelly SILT, little sand
	S3	9-11	102	4.8	0.0	1.2	82.1	See TP-A/S1		Sandy coarse to fine GRAVEL, little silt
TP-D	S1	6-8	93	3.5	0.0	0.6	29.0	138.3	8.3	SAND and GRAVEL, some silt
	S2	8-10	93	5.3	-	4.3	75.8	See TP-D/S2		Sandy coarse to fine GRAVEL, little silt
TP-E	S1	4-6	90	2.4	0.0	1.0	41.6	132.9	6.6	Silty coarse to fine GRAVEL, some sand
	S2	8-10	90	2.5	-	4.4	61.3	-	-	Sandy coarse to fine GRAVEL, little silt

Notes:

1. Refer to Drawing 1 for locations of test pit.
2. Refer to Appendix B for Test Pit results.
3. Following samples combined for proctor density test:
   TP-A/S1; TP-B/S1 and TP-C/S3
   TP-A/S3; TP-B/S3
   TP-D/S1; TP-D/S2

Drawings

Drawing 1 – Test Pit Plan



LEGEND

B-1	LOCATION AND GROUND SURFACE ELEVATION OF TEST BORINGS DRILLED BY GENERAL BORINGS, INC. OF PROSPECT, CT DURING THE PERIOD APRIL 18-20, 2016.
TP-A	LOCATION AND GROUND SURFACE ELEVATION OF TEST PITS EXCAVATED BY MAD RIVER CONSTRUCTION ON SEPTEMBER 1, 2016
85.2	EXISTING GROUND SURFACE ELEVATIONS SHOWN ON BASE PLAN EXISTING SPOT GRADE ELEVATION
84	PROPOSED FINISHED GRADE
84 — 84	INTERPOLATED CONTOUR ELEVATION TOP OF SUITABLE BEARING SOIL IN BUILDING ADDITION. SUITABLE BEARING SOIL CONSISTS OF SUBSOIL PROVIDED IT CAN BE RECOMPACTED IN PLACE, EXCEPT AT B-1, B-2 AND B-16 SUITABLE BEARING SOIL CONSISTS OF GLACIAL TILL.
86 — 86	

NOTES

1. BASE PLAN IS AN ELECTRONIC TRANSFER OF "PROPERTY TOPOGRAPHIC SURVEY, DEANS MILL ELEMENTARY SCHOOL, STONINGTON, CT" SHEET 1 OF 1, DATED MARCH 1 2016 (BY MALONE & MACBROOM. LATEST UPDATE APRIL 26, 2016)
2. ELEVATIONS ARE IN FEET AND REFER TO NAVD 1988 DATUM.
3. MILONE AND MACBROOM LOCATED AS DRILLED TEST BORING LOCATIONS OF EXPLORATIONS AND DETERMINED GROUND SURFACE ELEVATIONS.

GNCB Consulting Engineers, P.C.
130 ELM STREET
POST OFFICE BOX 802
OLD SAYBROOK
CONNECTICUT 06475
PHONE: 860 388 1224
FAX: 860 388 4613
GNCBENGINEERS.COM

DEANS MILL SCHOOL
35 DEANS MILL ROAD, STONINGTON, CT

TEST PIT PLAN

SCALE: 1" = 100'-0" SEPTEMBER 2016

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Appendix A

Test Pit Logs

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TEST PIT REPORT

Project: Addition to Deans Mill School
Client: Town of Stonington, Stonington, CT
Contractor: Mad River Construction, Westerly, RI
Equipment: CAT 315B Tracked Backhoe with 1 cu. yd. Bucket

Project No. 16051.09
Test Pit No: TP-A
Elevation: 102 (Approx.)
Date: 01 Sept. 2016
Field Rep.: Garry Jacobsen

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	Description of Materials	Remarks
	0.5			Topsoil, Forest Mat	
- 2 -				Mottled yellow brown to tan fine sandy, SILT, little gravel with few boulders	
- 4 -	4.0			SUBSOIL	
		S1	4.0 to 6.0	Tan gravelly coarse to fine SAND, little silt, few cobbles and small boulders.	
- 6 -					
- 8 -		S2	8.0 to 10.0		
- 10 -		S3	10.0 to 12.0	Tan sandy coarse to fine GRAVEL, trace silt.	
- 12 -				GLACIAL TILL	
				Bottom of Test Pit at 12.0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.

NOT ENCOUNTERED X

* HRS. AFTER COMPL.

13 (L) x 4 (W) x 12 (D) = 624 Cu. Ft.

NOTE: Length (L) and Width (W) measurements made at ground surface; Volume reflects a reduced width with depth.

BOUNDERS

8" TO 18" DIAM: NO. 5 = Vol. 5 Cu. Ft.
OVER 18" DIAM: No. 3 = Vol. 28 Cu. Ft.

SUMMARY

DEPTH 12.0 ft.
JAR SAMPLES 0
BAG SAMPLES 3
GROUNDWATER NE

TEST PIT NO. TP-A

GNCB
Consulting Engineers, P.C.

TEST PIT REPORT

Project: Addition to Deans Mill School
Client: Town of Stonington, Stonington, CT
Contractor: Mad River Construction, Westerly, RI
Equipment: CAT 315B Tracked Backhoe with 1 cu. yd. Bucket

Project No. 16051.09
Test Pit No: TP-B
Elevation: 102 (Approx.)
Date: 01 Sept. 2016
Field Rep.: Garry Jacobsen

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	Description of Materials	Remarks
	0.5			Topsoil/Forest Mat	
- 2 -	2.0			Yellow brown fine sandy SILT, trace gravel. Few cobbles and small boulders. SUBSOIL	
- 4 -				Mottled red brown to tan sandy coarse to fine GRAVEL, some silt, few cobbles and small boulders.	
		S1	4.0 to 6.0		
- 6 -	6.0				
				Tan medium to fine SAND, little silt, and coarse to fine gravel with numerous cobbles, few small boulders grading to gray brown medium to fine SAND. Little gravel, trace silt below 10'.	
- 8 -		S2	7.0 to 9.0		
- 10 -					
		S3	10.0 to 12.0	Tan sandy coarse to fine GRAVEL, trace silt. GLACIAL TILL	
				Bottom of Test Pit at 13.0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.

NOT ENCOUNTERED X

* HRS. AFTER COMPL.

14 (L) x 4 (W) x 13 (D) = 728 Cu. Ft.

NOTE: Length (L) and Width (W) measurements made at ground surface; Volume reflects a reduced width with depth.

BOULDERS

8" TO 18" DIAM: NO. 10 = Vol. 10 Cu. Ft.
OVER 18" DIAM: No. 3 = Vol. 6 Cu. Ft.

SUMMARY

DEPTH 13.0 ft.
JAR SAMPLES 0
BAG SAMPLES 3
GROUNDWATER NE

TEST PIT NO. TP-B

GNCB
Consulting Engineers, P.C.

TEST PIT REPORT

Project: Addition to Deans Mill School
Client: Town of Stonington, Stonington, CT
Contractor: Mad River Construction, Westerly, RI
Equipment: CAT 315B Tracked Backhoe with 1 cu. yd. Bucket

Project No. 16051.09
Test Pit No: TP-C
Elevation: 102 (Approx.)
Date: 01 Sept. 2016
Field Rep.: Garry Jacobsen

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	Description of Materials	Remarks
	0.8			Topsoil/Forest Mat	
- 2 -	2.5-3.0 varies			Yellow brown fine sandy SILT, little coarse to fine gravel with cobbles and several small boulders. SUBSOIL	
- 4 -		S1	3.0 to 5.0	Tan fine SAND, little silt and coarse to fine gravel. Several small boulders, numerous cobbles, with layers or pockets of sandy SILT.	
- 6 -		S2	5.0 to 7.0	Tan gravelly SILT, little sand.	
- 8 -	8.0			GLACIAL TILL	
- 10 -		S3	9.0 to 11.0	Tan sandy coarse to fine GRAVEL, little silt cobbles and boulders plus gravel below 8'.	3 boulders not removed from test pit.
- 12 -				Bottom of Test Pit at 12. 0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.

NOT ENCOUNTERED X
* HRS. AFTER COMPL.

14 x 4 x 12 = 672 Cu. Ft.
(L) (W) (D)

NOTE: Length (L) and Width (W) measurements made at ground surface; Volume reflects a reduced width with depth.

BOULDERS
8" TO 18" DIAM: NO. 5 = Vol. 5 Cu. Ft.
OVER 18" DIAM: No. 1 = Vol. 3 Cu. Ft.

SUMMARY

DEPTH 12.0 ft.
JAR SAMPLES --
BAG SAMPLES 3
GROUNDWATER NE

TEST PIT NO. TP-C

GNCB
Consulting Engineers, P.C.

TEST PIT REPORT

Project: Addition to Deans Mill School
Client: Town of Stonington, Stonington, CT
Contractor: Mad River Construction, Westerly, RI
Equipment: CAT 315B Tracked Backhoe with 1 cu. yd. Bucket

Project No. 16051.09
Test Pit No: TP-D
Elevation: 93 (Approx.)
Date: 01 Sept. 2016
Field Rep.: Garry Jacobsen

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	Description of Materials	Remarks
	0.8			Topsoil/Forest Mat	Note: A large 20 ft. by 12 ft. surface boulder near test pit.
- 2 -				Yellow brown fine sandy SILT, little coarse to fine gravel with numerous boulders.	
- 4 -	4.5			SUBSOIL	
	5.5			Intermix and yellow brown to tan silty medium to fine SAND, little gravel with numerous cobbles.	
- 6 -		S1	6.0 to 8.0	Tan SAND and GRAVEL, some silt	
- 8 -		S2	8.0 to 10.0	Tan silty coarse to fine GRAVEL, with numerous cobbles and few small boulders.	
- 10 -		S3	10.0 to 12.0		
- 12 -				GLACIAL TILL	
				Bottom of Test Pit at 12. 0 ft.	

GROUNDWATER

DATE	TIME*	DEPTH/FT.

NOT ENCOUNTERED X

* HRS. AFTER COMPL.

14 (L) x 6 (W) x 12 (D) = 1008 Cu. Ft.

NOTE: Length (L) and Width (W) measurements made at ground surface; Volume reflects a reduced width with depth.

BOULDERS

8" TO 18" DIAM: NO. 15 = Vol. 15 Cu. Ft.
OVER 18" DIAM: No. 9 = Vol. 90 Cu. Ft.

SUMMARY

DEPTH 12.0 ft.
JAR SAMPLES --
BAG SAMPLES 3
GROUNDWATER NE

TEST PIT NO. TP-D

GNCB
Consulting Engineers, P.C.

TEST PIT REPORT

Project: Addition to Deans Mill School
Client: Town of Stonington, Stonington, CT
Contractor: Mad River Construction, Westerly, RI
Equipment: CAT 315B Tracked Backhoe with 1 cu. yd. Bucket

Project No. 16051.09
Test Pit No: TP-E
Elevation: 90 (Approx.)
Date: 01 Sept. 2016
Field Rep.: Garry Jacobsen

Scale in Feet	Strata Change	Sample Number	Sample Depth Range	Description of Materials	Remarks
	0.8			Topsoil/Forest Mat	
- 2 -	3.5			Yellow brown fine sandy SILT, little coarse to fine gravel, with numerous boulders SUBSOIL	
- 4 -					
		S1	4.0 to 6.0	Tan silty coarse to fine GRAVEL, some sand with few boulders up to 8". Very dense, difficult to excavate.	
- 6 -					
- 8 -					
		S2	8.0 to 10.0	Tan sandy coarse to fine GRAVEL, little silt.	
- 10 -					
- 12 -				GLACIAL TILL	Rock not encountered.
				Bottom of Test Pit at 12.0 ft.	

GROUNDWATER		
DATE	TIME*	DEPTH/FT.
NOT ENCOUNTERED	X	* HRS. AFTER COMPL.

14 (L) x 7 (W) x 12 (D) = 1176 Cu. Ft.

NOTE: Length (L) and Width (W) measurements made at ground surface; Volume reflects a reduced width with depth.

BOULDERS
8" TO 18" DIAM: NO. 20 = Vol. 96 Cu. Ft.
OVER 18" DIAM: No. 11 = Vol. 11 Cu. Ft.

SUMMARY

DEPTH 12.0 ft.
JAR SAMPLES 0
BAG SAMPLES 2
GROUNDWATER NE

TEST PIT NO. TP-E

GNCB
Consulting Engineers, P.C.

Appendix B

Graphic Plots of Laboratory Soil Test Results

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	---	Sample Type:	---	Tested By:	jbr
Sample ID:	---	Test Date:	09/14/16	Checked By:	emm
Depth :	---	Test Id:	389975		

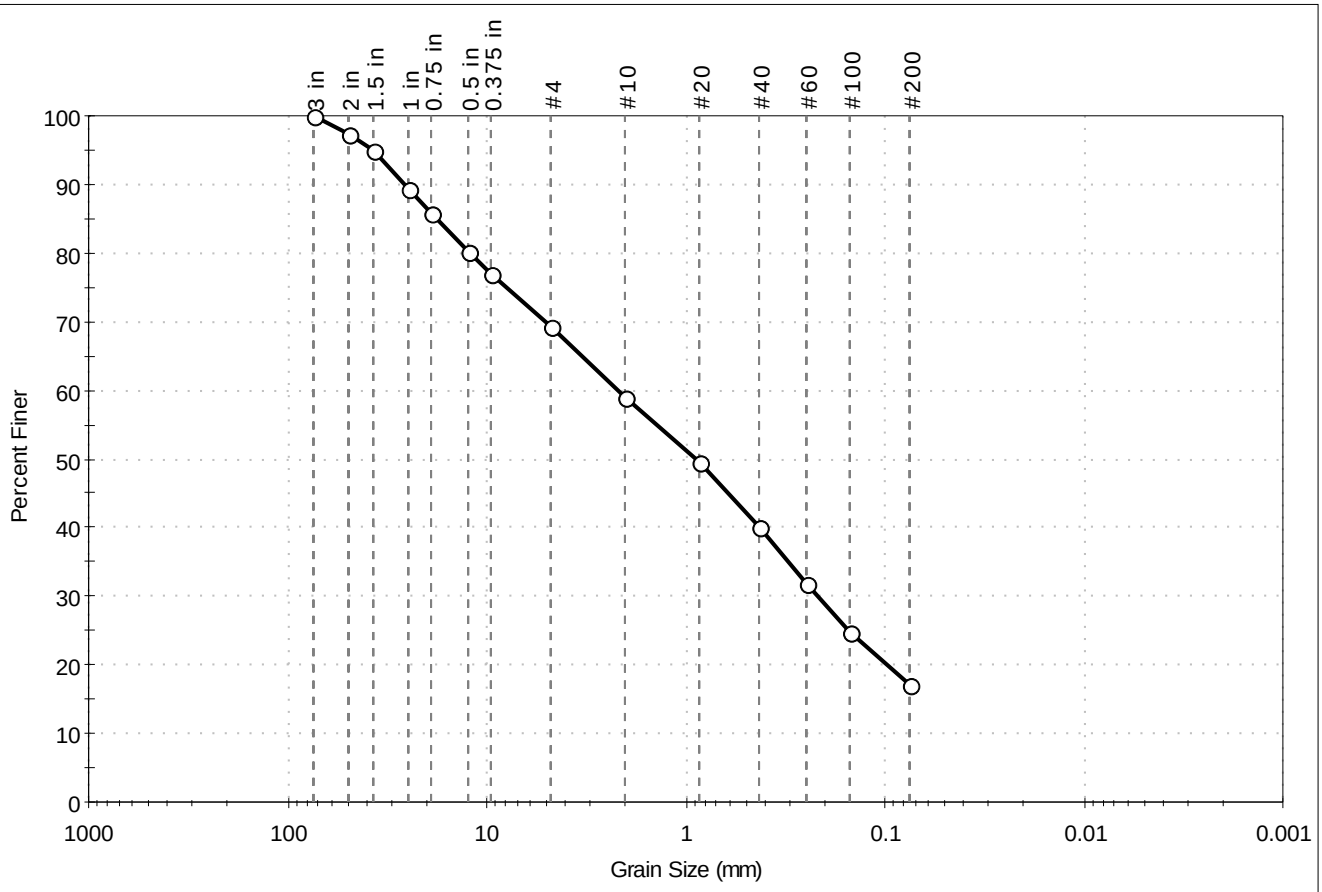
Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content, %
TP-A	S1	4-6 ft	Moist, pale brown silty sand with gravel	4.1
TP-A	S3	10-12 ft	Moist, brown gravel with silt, sand and cobble	1.4
TP-B	S1	4-6 ft	Moist, brown silty sand with gravel and cobble	1.2
TP-B	S3	10-12 ft	Moist, brown gravel with silt, sand and cobble	2.0
TP-C	S2	5-7 ft	Moist, brown silty sand with gravel and cobble	5.1
TP-C	S3	9-11 ft	Moist, pale brown silty sand with gravel and cobble	4.8
TP-D	S1	6-8 ft	Moist, pale brown silty sand with gravel	3.5
TP-D	S2	8-10 ft	Moist, brown silty gravel with sand and cobble	5.3
TP-E	S1	4-6 ft	Moist, pale brown silty sand with gravel and cobble	2.4
TP-E	S2	8-10 ft	Moist, brown silty gravel with sand and cobble	2.5

Notes: Temperature of Drying : 110° Celsius

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-A	Sample Type:	bag	Tested By:	jbr
Sample ID:	S1	Test Date:	09/14/16	Checked By:	emm
Depth :	4-6 ft	Test Id:	389976		
Test Comment:	---				
Visual Description:	Moist, pale brown silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



%Cobble	%Gravel	%Sand	%Silt & Clay Size
---	30.8	52.0	17.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3 in	75.00	100		
2 in	50.00	97		
1.5 in	37.50	95		
1 in	25.00	90		
0.75 in	19.00	86		
0.5 in	12.50	80		
0.375 in	9.50	77		
#4	4.75	69		
#10	2.00	59		
#20	0.85	49		
#40	0.42	40		
#60	0.25	32		
#100	0.15	25		
#200	0.075	17		

Coefficients

D_{85} = 17.7760 mm	D_{30} = 0.2167 mm
D_{60} = 2.1641 mm	D_{15} = N/A
D_{50} = 0.8945 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

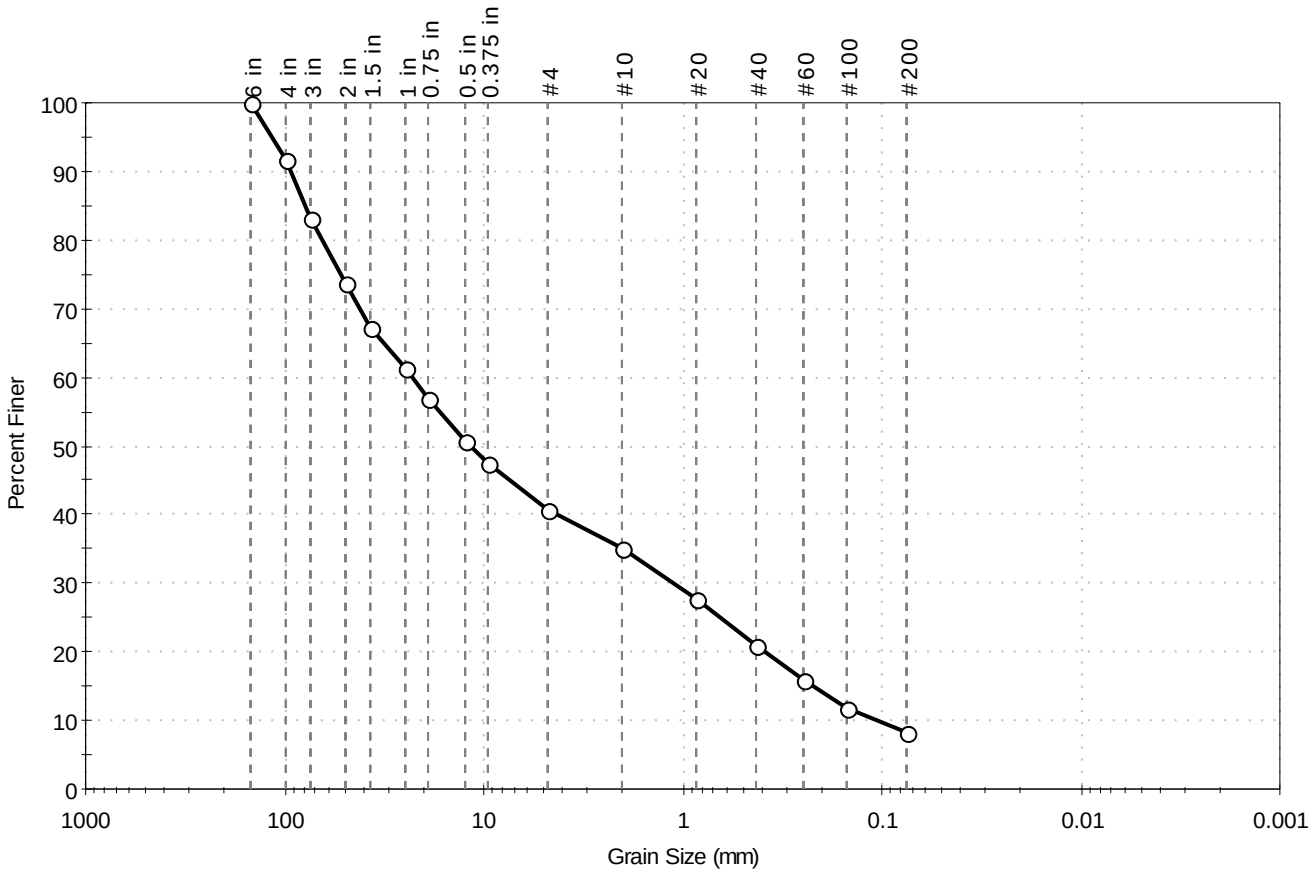
Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-A	Sample Type:	bag	Tested By:	jbr
Sample ID:	S3	Test Date:	09/14/16	Checked By:	emm
Depth :	10-12 ft	Test Id:	389977		
Test Comment:	---				
Visual Description:	Moist, brown gravel with silt, sand and cobble				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
16.7	42.5	32.7	8.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100		
4 in	100.00	92		
3 in	75.00	83		
2 in	50.00	74		
1.5 in	37.50	67		
1 in	25.00	61		
0.75 in	19.00	57		
0.5 in	12.50	51		
0.375 in	9.50	48		
#4	4.75	41		
#10	2.00	35		
#20	0.85	28		
#40	0.42	21		
#60	0.25	16		
#100	0.15	12		
#200	0.075	8.1		

Coefficients

D_{85} = 79.4006 mm	D_{30} = 1.1120 mm
D_{60} = 23.0441 mm	D_{15} = 0.2253 mm
D_{50} = 11.6345 mm	D_{10} = 0.1064 mm
C_u = 216.580	C_c = 0.504

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

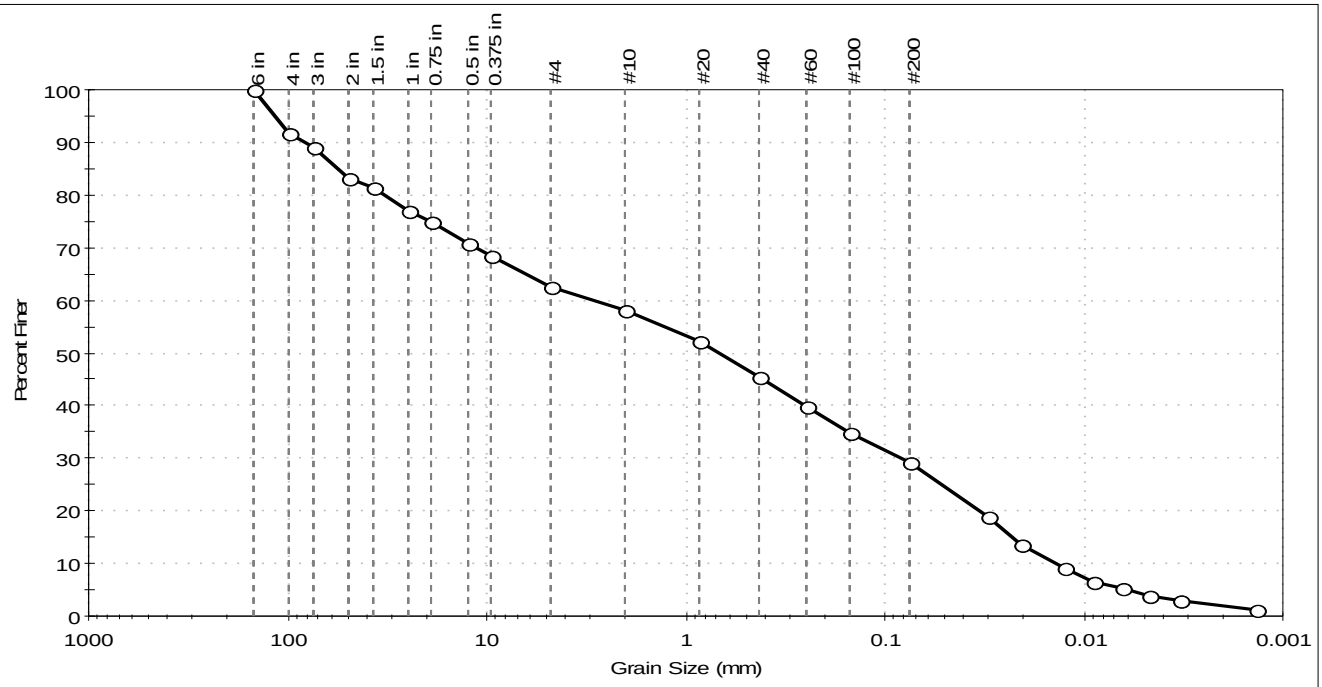
Sample / Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-B	Sample Type:	bag	Tested By:	jbr
Sample ID:	S1	Test Date:	09/15/16	Checked By:	emm
Depth :	4-6 ft	Test Id:	389981		
Test Comment:	---				
Visual Description:	Moist, brown silty sand with gravel and cobble				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
11.1	26.2	33.4	29.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100		
4 in	100.00	92		
3 in	75.00	89		
2 in	50.00	83		
1.5 in	37.50	82		
1 in	25.00	77		
0.75 in	19.00	75		
0.5 in	12.50	71		
0.375 in	9.50	68		
#4	4.75	63		
#10	2.00	58		
#20	0.85	52		
#40	0.42	46		
#60	0.25	40		
#100	0.15	35		
#200	0.075	29		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0301	19		
---	0.0205	14		
---	0.0125	9		
---	0.0091	6		
---	0.0065	5		
---	0.0047	4		
---	0.0033	3		
---	0.0014	1		

Coefficients

D_{85} = 56.5655 mm D_{30} = 0.0820 mm

D_{60} = 2.8557 mm D_{15} = 0.0227 mm

D_{50} = 0.6736 mm D_{10} = 0.0137 mm

C_u = 208.445 C_c = 0.172

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

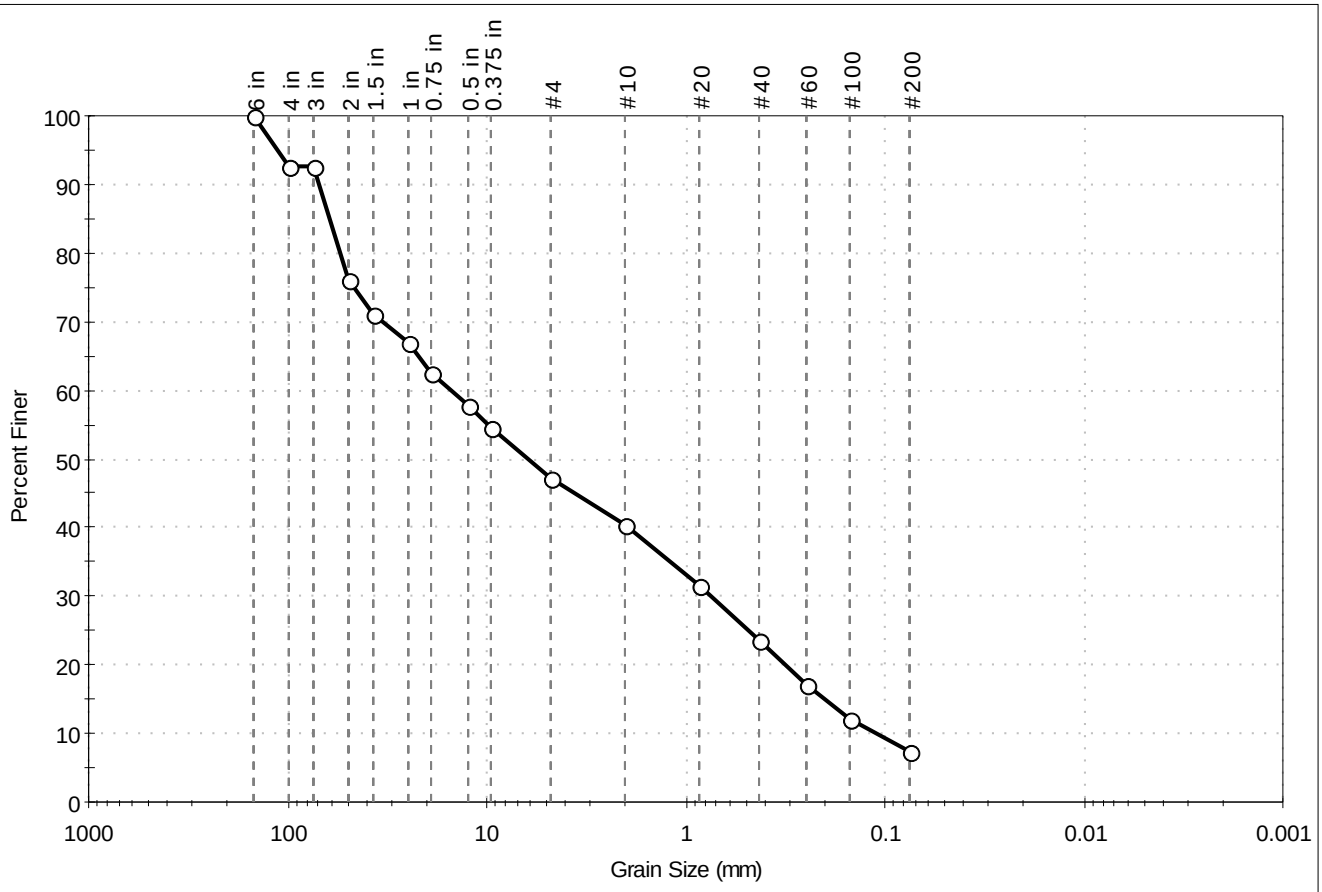
Dispersion Period : 1 minute

Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-B	Sample Type:	bag	Tested By:	jbr
Sample ID:	S3	Test Date:	09/14/16	Checked By:	emm
Depth :	10-12 ft	Test Id:	389978		
Test Comment:	---				
Visual Description:	Moist, brown gravel with silt, sand and cobble				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
7.4	45.5	39.6	7.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100		
4 in	100.00	93		
3 in	75.00	93		
2 in	50.00	76		
1.5 in	37.50	71		
1 in	25.00	67		
0.75 in	19.00	63		
0.5 in	12.50	58		
0.375 in	9.50	54		
#4	4.75	47		
#10	2.00	40		
#20	0.85	32		
#40	0.42	23		
#60	0.25	17		
#100	0.15	12		
#200	0.075	7.5		

Coefficients

D_{85} = 62.2515 mm	D_{30} = 0.7405 mm
D_{60} = 15.2129 mm	D_{15} = 0.2017 mm
D_{50} = 6.2524 mm	D_{10} = 0.1105 mm
C_u = 137.673	C_c = 0.326

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (1))

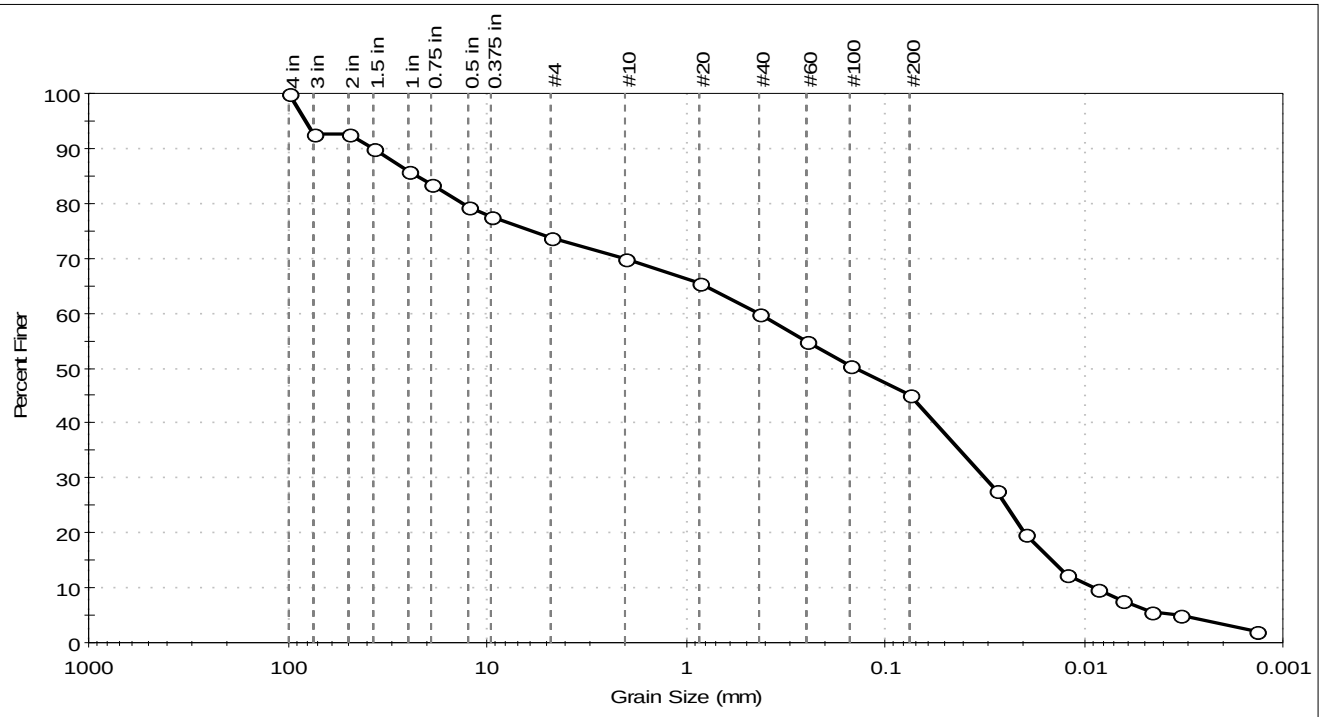
Sample / Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-C	Sample Type:	bag	Tested By:	jbr
Sample ID:	S2	Test Date:	09/15/16	Checked By:	emm
Depth :	5-7 ft	Test Id:	389982		
Test Comment:	---				
Visual Description:	Moist, brown silty sand with gravel and cobble				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
7.3	19.0	28.5	45.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3 in	75.00	93		
2 in	50.00	93		
1.5 in	37.50	90		
1 in	25.00	86		
0.75 in	19.00	83		
0.5 in	12.50	79		
0.375 in	9.50	77		
#4	4.75	74		
#10	2.00	70		
#20	0.85	65		
#40	0.42	60		
#60	0.25	55		
#100	0.15	50		
#200	0.075	45		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0277	28		
---	0.0196	20		
---	0.0123	12		
---	0.0085	10		
---	0.0064	8		
---	0.0046	6		
---	0.0033	5		
---	0.0013	2		

Coefficients

D_{85} = 22.6939 mm	D_{30} = 0.0314 mm
D_{60} = 0.4295 mm	D_{15} = 0.0146 mm
D_{50} = 0.1412 mm	D_{10} = 0.0090 mm
C_u = 47.722	C_c = 0.255

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

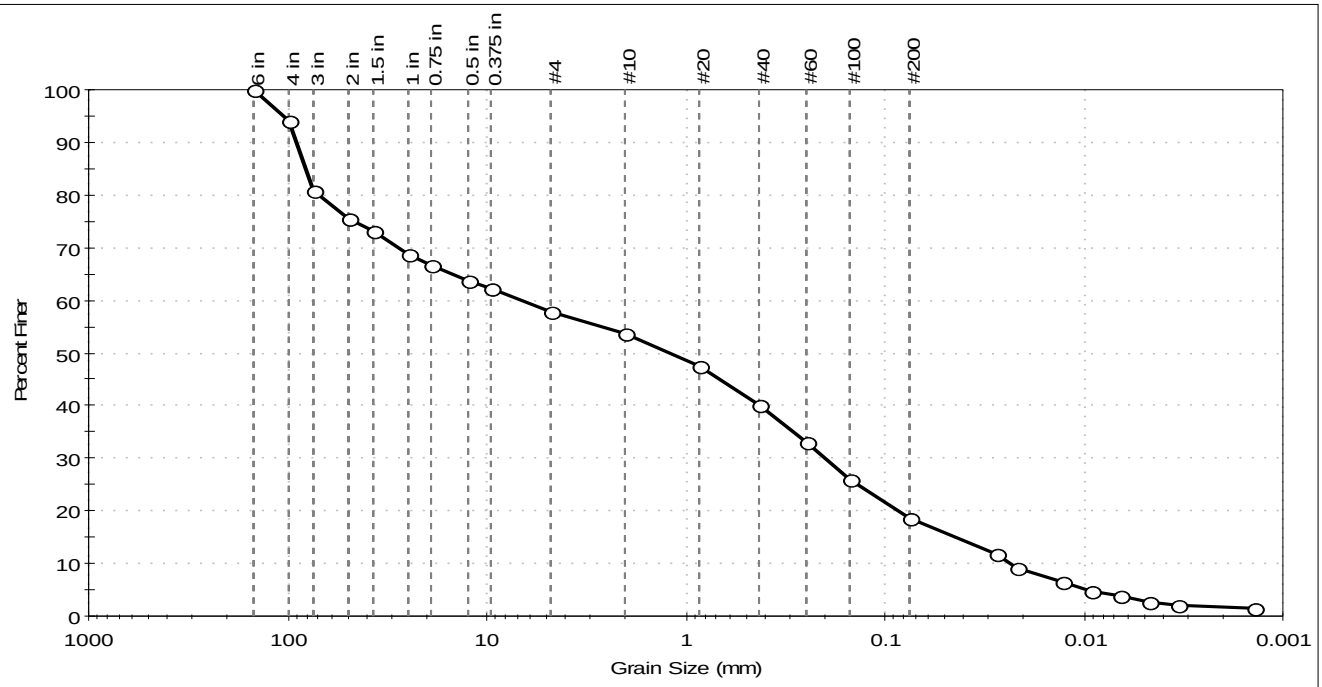
Dispersion Period : 1 minute

Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-C	Sample Type:	bag	Tested By:	jbr
Sample ID:	S3	Test Date:	09/14/16	Checked By:	emm
Depth :	9-11 ft	Test Id:	389983		
Test Comment:	---				
Visual Description:	Moist, pale brown silty sand with gravel and cobble				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
19.1	23.2	39.1	18.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100		
4 in	100.00	94		
3 in	75.00	81		
2 in	50.00	76		
1.5 in	37.50	73		
1 in	25.00	69		
0.75 in	19.00	67		
0.5 in	12.50	64		
0.375 in	9.50	62		
#4	4.75	58		
#10	2.00	54		
#20	0.85	47		
#40	0.42	40		
#60	0.25	33		
#100	0.15	26		
#200	0.075	19		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0273	12		
---	0.0217	9		
---	0.0129	6		
---	0.0092	5		
---	0.0066	4		
---	0.0047	3		
---	0.0034	2		
---	0.0014	2		

Coefficients

D_{85} = 82.0504 mm
D_{30} = 0.2019 mm
D_{60} = 6.7760 mm
D_{15} = 0.0440 mm
D_{50} = 1.1984 mm
D_{10} = 0.0235 mm
C_u = 288.340
C_c = 0.256

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

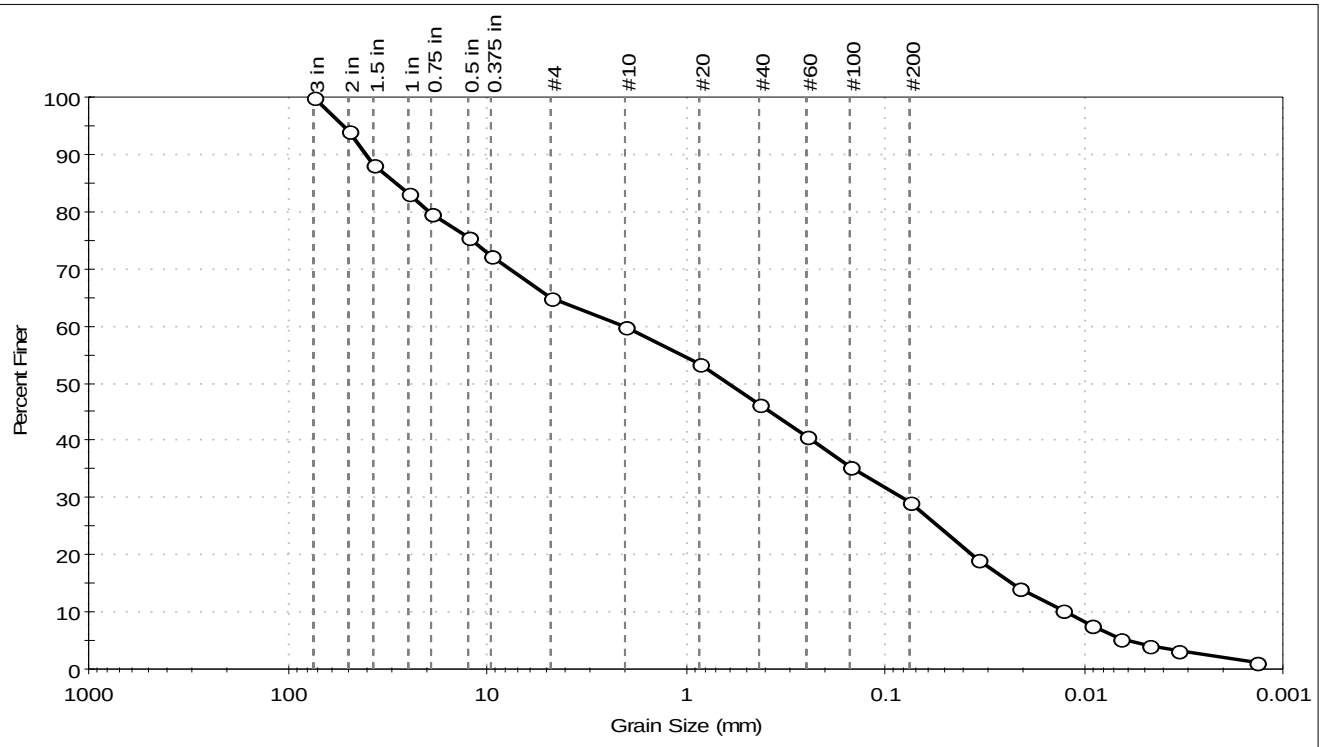
Dispersion Period : 1 minute

Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-D	Sample Type:	bag	Tested By:	jbr
Sample ID:	S1	Test Date:	09/15/16	Checked By:	emm
Depth :	6-8 ft	Test Id:	389984		
Test Comment:	---				
Visual Description:	Moist, pale brown silty sand with gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	35.0	35.7	29.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3 in	75.00	100		
2 in	50.00	94		
1.5 in	37.50	88		
1 in	25.00	83		
0.75 in	19.00	80		
0.5 in	12.50	75		
0.375 in	9.50	72		
#4	4.75	65		
#10	2.00	60		
#20	0.85	53		
#40	0.42	46		
#60	0.25	41		
#100	0.15	36		
#200	0.075	29		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0343	19		
---	0.0210	14		
---	0.0129	10		
---	0.0093	8		
---	0.0066	5		
---	0.0047	4		
---	0.0033	3		
---	0.0014	1		

Coefficients

D_{85} = 28.9773 mm	D_{30} = 0.0811 mm
D_{60} = 2.0537 mm	D_{15} = 0.0227 mm
D_{50} = 0.6108 mm	D_{10} = 0.0126 mm
C_u = 162.992	C_c = 0.254

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample / Test Description

Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

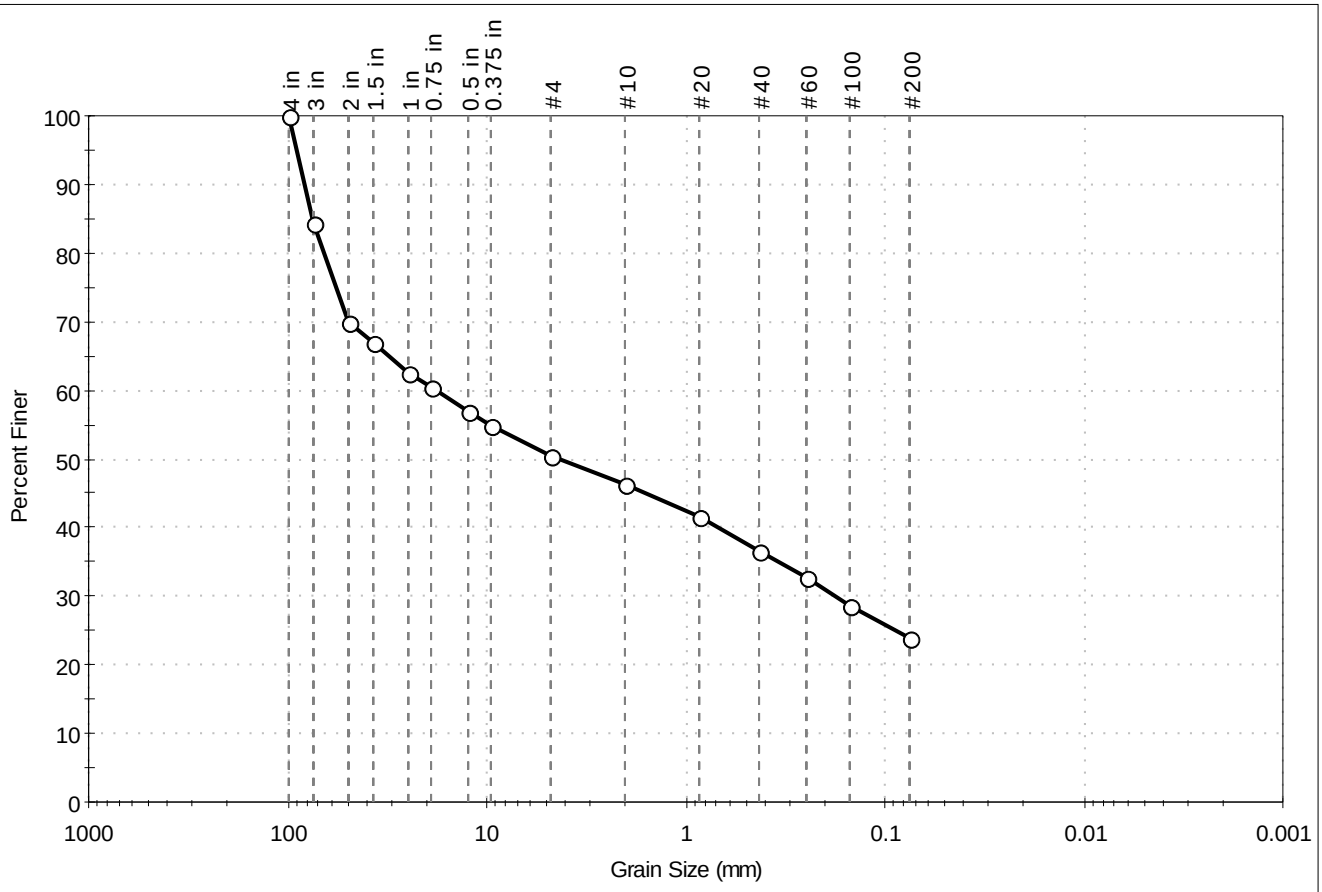
Dispersion Period : 1 minute

Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-D	Sample Type:	bag	Tested By:	jbr
Sample ID:	S2	Test Date:	09/14/16	Checked By:	emm
Depth :	8-10 ft	Test Id:	389979		
Test Comment:	---				
Visual Description:	Moist, brown silty gravel with sand and cobble				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



%Cobble	%Gravel	%Sand	%Silt & Clay Size
15.6	33.8	26.6	24.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3 in	75.00	84		
2 in	50.00	70		
1.5 in	37.50	67		
1 in	25.00	62		
0.75 in	19.00	60		
0.5 in	12.50	57		
0.375 in	9.50	55		
#4	4.75	51		
#10	2.00	46		
#20	0.85	41		
#40	0.42	37		
#60	0.25	33		
#100	0.15	29		
#200	0.075	24		

Coefficients

D_{85} = 75.8204 mm D_{30} = 0.1775 mm

D_{60} = 18.2347 mm D_{15} = N/A

D_{50} = 4.2533 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

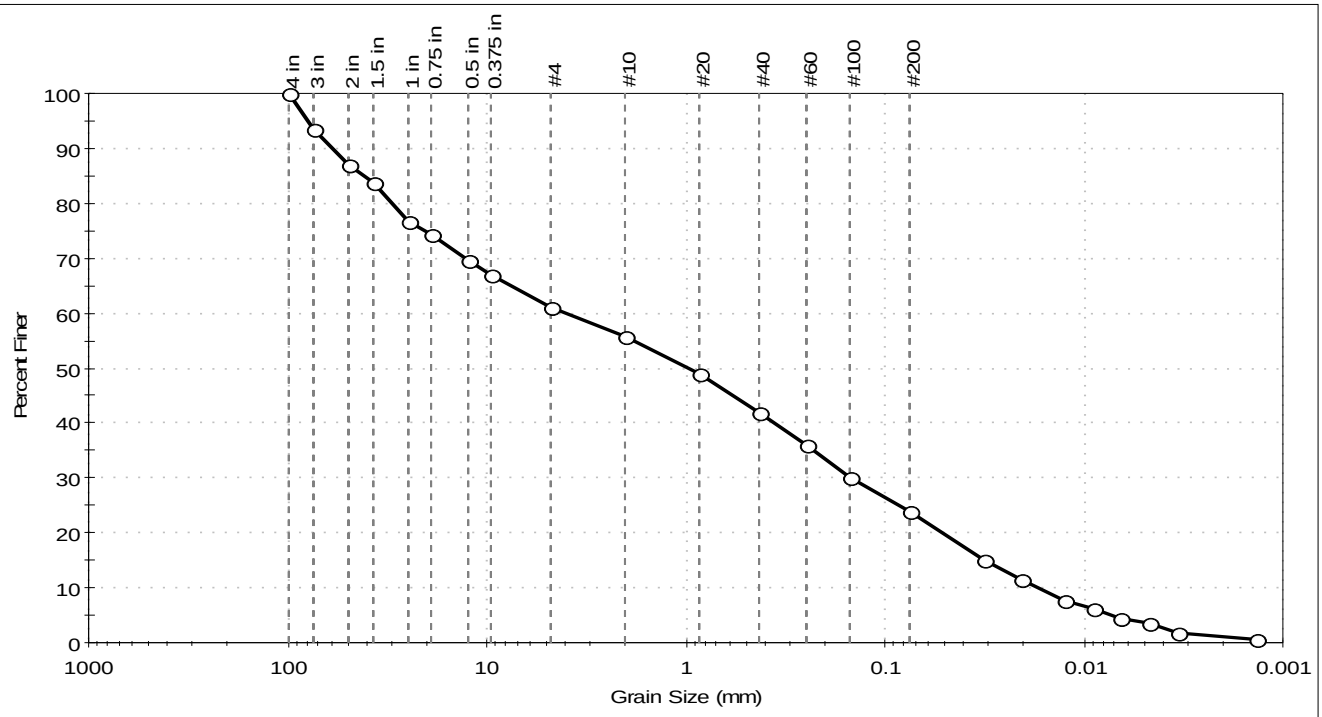
Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-E	Sample Type:	bag	Tested By:	jbr
Sample ID:	S1	Test Date:	09/15/16	Checked By:	emm
Depth :	4-6 ft	Test Id:	389985		
Test Comment:	---				
Visual Description:	Moist, pale brown silty sand with gravel and cobble				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
6.4	32.5	37.3	23.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4 in	100.00	100		
3 in	75.00	94		
2 in	50.00	87		
1.5 in	37.50	84		
1 in	25.00	77		
0.75 in	19.00	74		
0.5 in	12.50	70		
0.375 in	9.50	67		
#4	4.75	61		
#10	2.00	56		
#20	0.85	49		
#40	0.42	42		
#60	0.25	36		
#100	0.15	30		
#200	0.075	24		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0320	15		
---	0.0209	12		
---	0.0124	8		
---	0.0091	6		
---	0.0066	5		
---	0.0047	3		
---	0.0034	2		
---	0.0014	1		

Coefficients

D_{85} = 41.6351 mm	D_{30} = 0.1463 mm
D_{60} = 3.9888 mm	D_{15} = 0.0323 mm
D_{50} = 0.9573 mm	D_{10} = 0.0168 mm
C_u = 237.429	C_c = 0.319

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

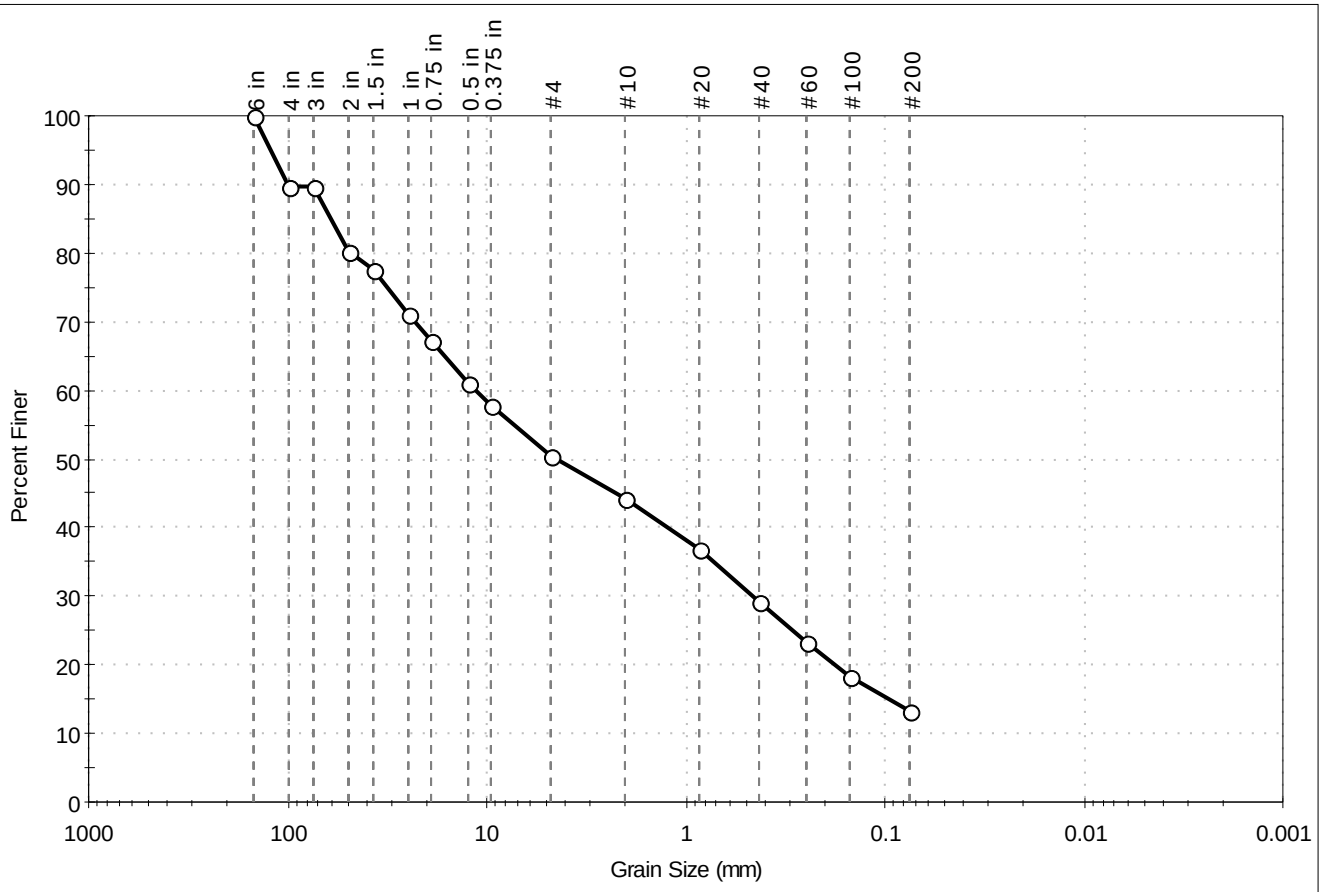
Dispersion Period : 1 minute

Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-E	Sample Type:	bag	Tested By:	jbr
Sample ID:	S2	Test Date:	09/14/16	Checked By:	emm
Depth :	8-10 ft	Test Id:	389980		
Test Comment:	---				
Visual Description:	Moist, brown silty gravel with sand and cobble				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
10.3	39.2	37.3	13.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
6 in	150.00	100		
4 in	100.00	90		
3 in	75.00	90		
2 in	50.00	80		
1.5 in	37.50	78		
1 in	25.00	71		
0.75 in	19.00	67		
0.5 in	12.50	61		
0.375 in	9.50	58		
#4	4.75	50		
#10	2.00	44		
#20	0.85	37		
#40	0.42	29		
#60	0.25	23		
#100	0.15	18		
#200	0.075	13		

Coefficients

D_{85} = 61.2706 mm	D_{30} = 0.4528 mm
D_{60} = 11.3646 mm	D_{15} = 0.0963 mm
D_{50} = 4.4445 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

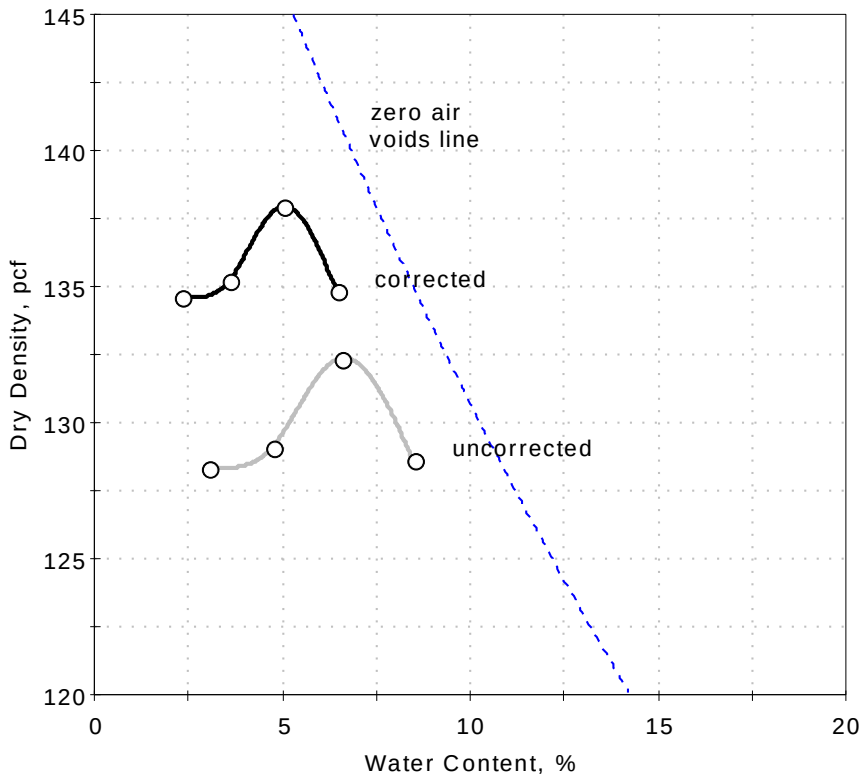
Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-A/TP-B/TP-C	Sample Type:	bag	Tested By:	cwd
Sample ID:	S1/S1/S3	Test Date:	09/26/16	Checked By:	emm
Depth :	---	Test Id:	391701		
Test Comment:	---				
Visual Description:	Moist, light olive brown silty sand with gravel				
Sample Comment:	---				

Compaction Report - ASTM D1557



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	128.3	129.1	132.4	128.6
Moisture Content, %	3.0	4.7	6.6	8.5

Method : C

Preparation : WET

As received Moisture :3 %

Rammer : Mechanical

Zero voids line based on assumed specific gravity of 2.65

Maximum Dry Density= 132.4 pcf

Optimum Moisture= 6.7 %

Oversize Correction (24.0% > 3/4 inch Sieve)

Corrected Maximum Dry Density= 138.0 pcf

Corrected Optimum Moisture= 5.1 %

Assumed Average Bulk Specific Gravity = 2.55

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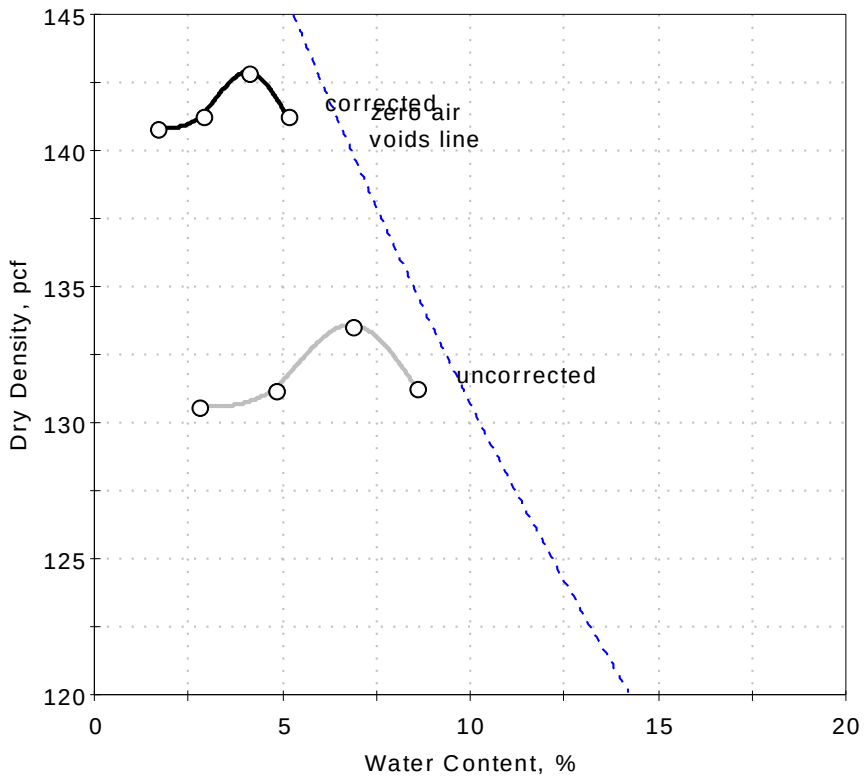
Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-A/TP-B	Sample Type:	bag	Tested By:	cwd
Sample ID:	S3/S3	Test Date:	09/26/16	Checked By:	emm
Depth :	---	Test Id:	391702		
Test Comment:	ASTM does not recommend this method when >30% is >3/4-inch sieve				
Visual Description:	Moist, olive brown gravel with silty sand				
Sample Comment:	---				

Compaction Report - ASTM D1557



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	130.6	131.2	133.6	131.3
Moisture Content, %	2.8	4.8	6.8	8.6

Method : C

Preparation : WET

As received Moisture :2 %

Rammer : Mechanical

Zero voids line based on assumed specific gravity of 2.65

Maximum Dry Density= 133.6 pcf

Optimum Moisture= 6.8 %

Oversize Correction (40.4% > 3/4 inch Sieve)

Corrected Maximum Dry Density= 142.9 pcf

Corrected Optimum Moisture= 4.1 %

Assumed Average Bulk Specific Gravity = 2.55

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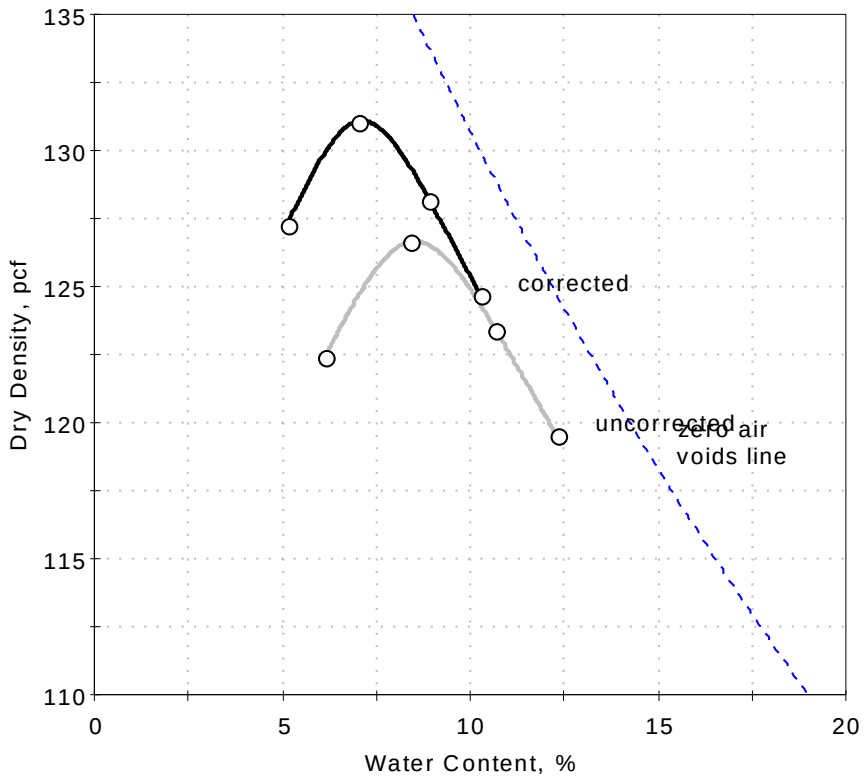
Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-C	Sample Type:	bag	Tested By:	cwd
Sample ID:	S2	Test Date:	09/26/16	Checked By:	emm
Depth :	5-7 ft	Test Id:	391245		
Test Comment:	---				
Visual Description:	Moist, brown silty sand with gravel and cobble				
Sample Comment:	---				

Compaction Report - ASTM D1557



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	122.4	126.7	123.4	119.5
Moisture Content, %	6.1	8.4	10.7	12.3

Method : C

Preparation : WET

As received Moisture :5 %

Rammer : Mechanical

Zero voids line based on assumed specific gravity of 2.65

Maximum Dry Density= 126.7 pcf

Optimum Moisture= 8.5 %

Oversize Correction (16.5% > 3/4 inch Sieve)

Corrected Maximum Dry Density= 131.1 pcf

Corrected Optimum Moisture= 7.1 %

Assumed Average Bulk Specific Gravity = 2.55

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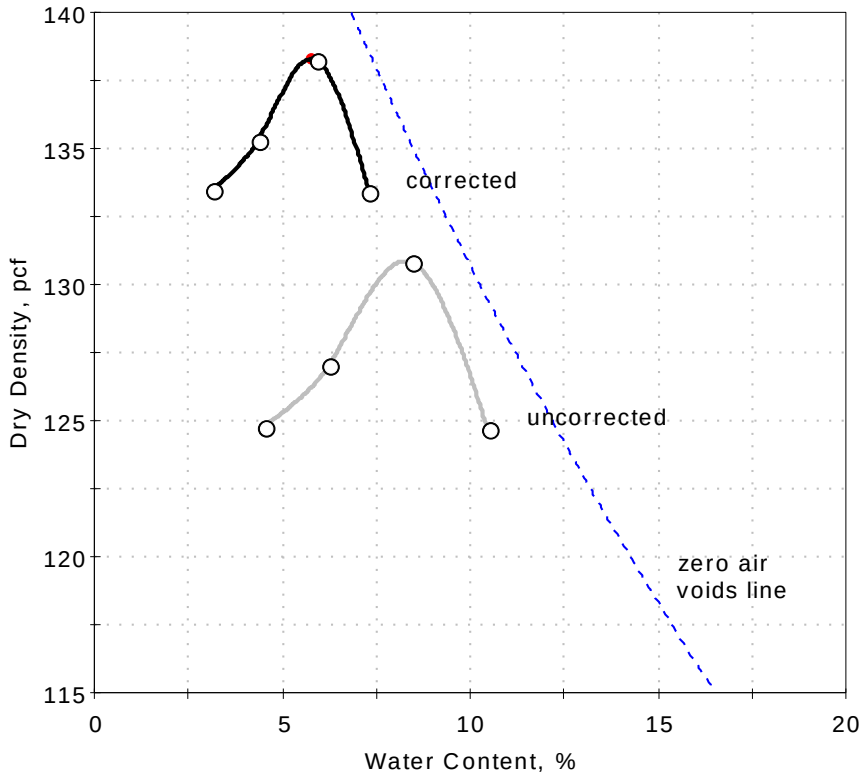
Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-D	Sample Type:	bag	Tested By:	cwd
Sample ID:	S1/S2	Test Date:	09/26/16	Checked By:	emm
Depth :	---	Test Id:	391703		
Test Comment:	ASTM does not recommend this method when >30% is >3/4-inch sieve				
Visual Description:	Moist, light olive brown silty sand with gravel				
Sample Comment:	---				

Compaction Report - ASTM D1557



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	124.8	127.0	130.8	124.7
Moisture Content, %	4.5	6.3	8.4	10.5

Method : C

Preparation : WET

As received Moisture :4 %

Rammer : Mechanical

Zero voids line based on assumed specific gravity of 2.65

Maximum Dry Density= 130.9 pcf

Optimum Moisture= 8.3 %

Oversize Correction (30.2% > 3/4 inch Sieve)

Corrected Maximum Dry Density= 138.3 pcf

Corrected Optimum Moisture= 5.8 %

Assumed Average Bulk Specific Gravity = 2.55

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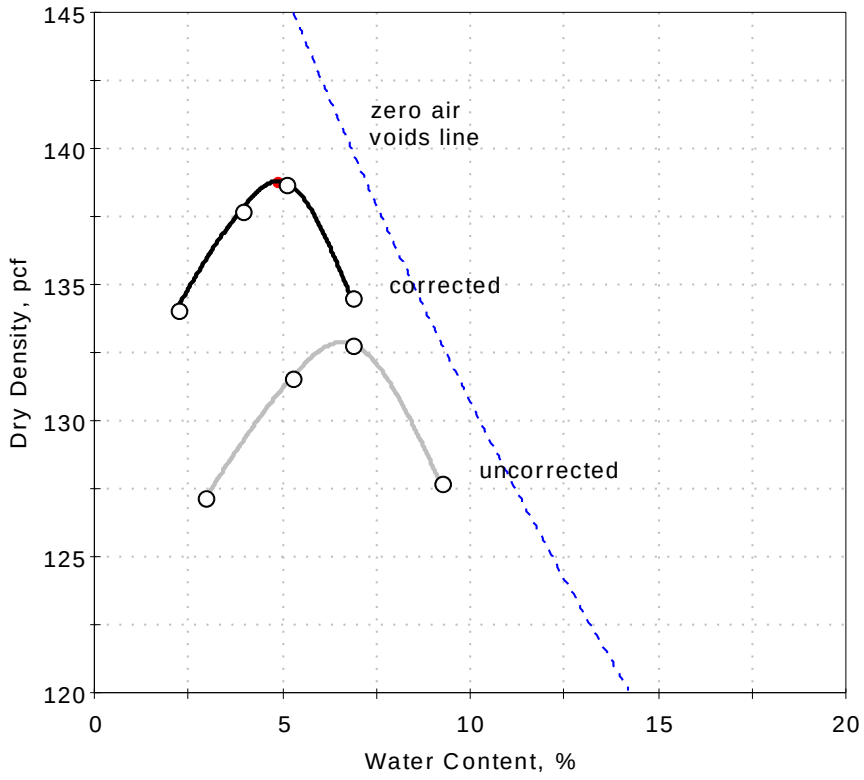
Client:	Gibble Norden Champion Brown				
Project:	Stonington Deans Mill School				
Location:	Stonington, CT			Project No:	GTX-305290
Boring ID:	TP-E	Sample Type:	bag	Tested By:	cwd
Sample ID:	S1	Test Date:	09/23/16	Checked By:	emm
Depth :	4-6 ft	Test Id:	391247		
Test Comment:	---				
Visual Description:	Moist, pale brown silty sand with gravel and cobble				
Sample Comment:	---				

Compaction Report - ASTM D1557



Data Points	Point 1	Point 2	Point 3	Point 4
Dry density, pcf	127.2	131.6	132.8	127.7
Moisture Content, %	3.0	5.3	6.8	9.2

Method : C

Preparation : WET

As received Moisture :2 %

Rammer : Mechanical

Zero voids line based on assumed specific gravity of 2.65

Maximum Dry Density= 132.9 pcf

Optimum Moisture= 6.6 %

Oversize Correction (25.8% > 3/4 inch Sieve)

Corrected Maximum Dry Density= 138.8 pcf

Corrected Optimum Moisture= 4.9 %

Assumed Average Bulk Specific Gravity = 2.55

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