

REQUEST FOR PROPOSAL

DESIGN/BUILD SERVICES FOR MARSH ROAD WATER PUMP STATION –PHASE 3 TOWN OF HUDSON, NH

Prepared for

**Town of Hudson
Engineering Department
12 School Street
Hudson, NH 03051**

MARCH 2024



Prepared by

**Town of Hudson
Engineering Department
12 School Street
Hudson, NH 03051**

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REQUEST FOR PROPOSAL

The Town of Hudson, New Hampshire wishes to engage the services of a qualified private firm to provide design and construction services of:

DESIGN/BUILD SERVICES FOR MARSH ROAD BOOSTER STATION-PHASE 3

The CONTRACTOR must be lawfully engaged in the service of design and construction of WATER PUMP STATIONS in the State of New Hampshire.

An overview and detailed specifications are provided later in the Request for Proposal (RFP).

Proposals must be received no later than **10:00 AM on April 26, 2024** from interested firms, to be eligible for consideration by the Town. Proposal shall follow the format listed below and be on the forms provided as required. Each statement shall be submitted in a sealed envelope, which is clearly marked,

“DESIGN/ BUILD SERVICES FOR MARSH ROAD BOOSTER STATION-PHASE 3 HUDSON, NEW HAMPSHIRE”

Requests may be issued only by the Town Engineer, or his designee, to authorized firms, and are not transferable unless authorized by the Town Engineer or his designee.

Complete copies of RFP are available from:

Mr. Elvis Dhima, P.E.
Town Engineer
Town Hall
12 School Street
Hudson, NH 03051
edhima@Hudsonnh.gov

All proposals received will be considered confidential and not available for public review until after a vendor has been selected.

The Town reserves the right to reject any or all proposals or any part thereof, to waive any formality, informality, information or errors in the proposal, to accept the proposal considered to be in the best interest of the Town, or to purchase on the open market if it is considered in the best interest of the Town to do so. Failure to submit all information called for and/or submission of an unbalanced proposal are sufficient reasons to declare a proposal as non-responsive and subject to disqualification.

Proposals which do not incorporate our requested format for **DESIGN / BUILD SERVICES FOR MARSH ROAD BOOSTER STATION – PHASE 3** will not be considered.

All proposals are advertised, at the Town’s discretion, in various publications and are posted publicly as detailed below:

Name	Advertising Medium	Address	Phone/Fax	Email and Web Address
Town Hall Hudson, NH	Post at Town Hall	12 School Street, Hudson NH 03051	603.886.6008 603.594.1142(fax)	edhima@hudsonnh.gov

TOWN OF HUDSON, NEW HAMPSHIRE

Mr. Elvis Dhima, PE, Town Engineer

Date: _____

PROPOSAL DUE DATE/TIME: APRIL 26, 2024 NOT LATER THAN 10:00 AM AT THE TOWN CLERK’S OFFICE, 12 SCHOOL STREET, HUDSON, NH.

A MANDATORY PRE-PROPOSAL MEETING WILL BE HELD AT THE SITE (BEHIND 33 RIVIERA ROAD) ON APRIL 12, 2024 AT 10:00 AM.

ALL QUESTIONS DUE BY APRIL 19, 2024 AT 10:00 AM.

PREPARATION OF PROPOSALS:

Proposals shall be submitted on the forms provided and must be signed by the Proposer or the Proposer’s authorized representative. The person signing the proposal shall initial any corrections to entries made on the proposal forms.

Proposers must quote on all items appearing on the proposal forms. Failure to quote on all items may disqualify the proposal.

Unless otherwise stated in the Request for Proposal (RFP), the Proposer agrees that the proposal shall be deemed open for acceptance for sixty (60) calendar days subsequent to submittal to the Town of Hudson or as modified by addendum.

Any questions or inquiries must be submitted in writing, and must be received by the Town Engineer, Elvis Dhima (edhima@hudsonnh.gov) no later than seven (7) calendar days before the Request for Proposals due date to be considered. Any responses to questions,

clarifications, or changes to the Request for Proposals will be provided to all Proposers of record that attended the pre-proposal meeting.

The Proposer shall not divulge, discuss or compare this proposal with other Proposers and shall not collude with any other Proposers or parties to a proposal whatever.

MANDATORY PRE-PROPOSAL MEETING:

All Proposers must attend the pre-proposal meeting at the **SITE at 10:00 AM on April 12, 2024. The site is located behind 33-36 Riviera Road.**

SUBMISSION OF PROPOSALS:

Proposals must be submitted at the Clerk's Office, Town Hall Offices, 12 School Street, Hudson NH by 10:00 AM April 26, 2024, as directed in the Request for Proposals, and on the forms provided unless otherwise specified. Proposals must be typewritten or printed in ink. Proposals must be mailed or delivered in person. Proposals that are faxed or e-mailed will not be accepted.

BID BOND

Each Bidder shall accompany the proposal with a bid guarantee in the form of Cashier's Check, or a Certified Check payable to the Town of Hudson, or a Bid Bond secured by a guaranteed company or surety company licensed to operate in the State of New Hampshire in the amount of 5% of the Bid. (See Attached).

The bid guarantees of the unsuccessful Bidders shall be returned as soon as practicable.

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their Power of Attorney.

AMENDMENTS TO PROPOSALS

If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.

Proposers shall acknowledge receipt of any amendment to this solicitation (1) by identifying the amendment number and date on the Proposal form, or by letter. Proposals which fail to acknowledge the Proposer's receipt of any amendment will result in the rejection of the Proposal if the amendment(s) contained information which substantively changed the municipality's requirements.

Amendments will be on file in the offices of the municipality and the Engineer at least 1 day before Proposal opening.

WITHDRAWAL OF PROPOSALS:

Proposals may be withdrawn by written notice, telegram (including mailgram) or facsimile machine transmission received at any time before the exact time set for opening of proposals; provided that written confirmation of telegraphic or facsimile withdrawals over the signature of the proposer is mailed and postmarked prior to the specified proposal opening time. A proposal may be withdrawn in person by a proposer or its authorized representative if, before the exact time set for opening of proposals, the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal. Negligence on the part of the Proposer in preparing this proposal shall not constitute a right to withdraw a proposal subsequent to the proposal opening. Proposals may not be withdrawn for the period as indicated in this Request for Proposals or as modified by addenda.

RECEIPT AND OPENING OF PROPOSALS:

Proposals shall be submitted prior to the time fixed in the Request for Proposals. Proposals received after the time so indicated shall be returned unopened.

All qualified Bidders will receive consideration without regard to race, color, religion, creed, age, sex, or national origin.

PROPOSAL RESULTS:

All proposals received shall be considered confidential and not available for public review until after a contractor has been selected. All proposals may be subject to negotiations prior to the award of a contract.

NO TELEPHONE REQUESTS FOR RESULTS WILL BE ACCEPTED OR GIVEN.

TIE PROPOSALS:

When identical Proposals are received, with respect to price, delivery, financial resources, experience, ability to perform and quality, award may be made by a toss of a coin.

LIMITATIONS:

This Request for Proposal (RFP) does not commit the Town to award a contract, to pay any costs incurred in the preparation of a response to this request, or to procure or contract for services, supplies or equipment. The Town reserves the right to accept or reject any or all proposals received as a result of this request, or to cancel in part or in its entirety this RFP, if it is in the best interest of the Town to do so.

The OWNER reserves the right to waive any informalities, to negotiate with any Bidder and to reject any or all Bids. No Bidder may withdraw his Bid within ninety (90) days after the actual date of the opening thereof.

PROPOSAL EVALUATION:

In an attempt to determine if a Proposer is responsible, the Town, at its discretion, may obtain technical support from outside sources. Each Proposer will agree to fully cooperate with the personnel of such organizations.

PROJECT BACKGROUND

Marsh Booster station consist of 2 -30 HP domestic pumps and one 75 HP fire pump. Currently, all the equipment and controllers are located underground a steel tank chamber. This booster station has one main access point and the tanks is approximately 8 feet deep.

Town of Hudson intent is to replace the underground booster station with an above ground booster station. **The pumps, motors, canisters and the VFD's have already been purchased under Phase 1. The pre cast building has already been purchase and its installation is under contract (Phase 2).** The current bid, Phase 3, consist of completing the project and having a turn-key booster station.

A design has been provided for this project and the contractor will be responsible for specification and shop drawings for all proposed components, such as SCADA components and electrical panels

This project will be 100% funded by the Town of Hudson.

SCOPE OF SERVICES

The Town of Hudson Engineering is soliciting Engineering and Contractor services to design and construct improvements at

MARSH ROAD BOOSTER STATION

The work will include the design and construction and involves the following:

- Assessment of the design plans (90 %)
- Prepare all permitting documents and acquire all permits required for construction (Town fees will be waived by the Town).
- Prepare shop drawings for electrical and mechanical components.
- Relocate/remove all components identified on the Demo Plan
- Rewire electrical components to existing onsite generator
- Prepare show drawings and specs for the design plan
- Construct the approved construction plan.
- Provide the Town with As-built Plans
- The proposed work will include all water pipe and gate valve installation from the building envelope (5' off the building) to the suction and discharge line, per plan.
- The installation of the electrical service to the building and backup generator is included under Phase 2.

- The proposed work will include all electrical and mechanical installation within the building except the canisters, which will be installed under phase 2.
- Contract shall be able to work with RH White who are responsible for phase 2 of this project.
- Work with Town SCADA consultant regarding operation and programming of the booster station and in line with the design parameters of the station.
- Removing all the old components (electrical/mechanical/communications) from the old booster station

All prices include control, any modifications to the existing controller, cabinet, wiring or other appurtenances and any new equipment, wiring, labor, etc. to provide a fully functioning water pump station. **The pumps, motors, canisters and the VFD's have already been purchased. The building installation, canister installations and piping within 5 feet of the building is under contract, under phase 2.**

The existing water pump station must remain operational at all times during the construction unless directed by the Engineer in writing.

Proposers shall demonstrate experience in the design and installation of projects.

1. Description of Services Requested

The Engineering Firm/Contractor will need to provide the Town with a written description of the proposed work for review and approval.

2. Time Frame for Performance of Services

A contract will be signed as soon as possible after the Proposal due date and completion of the Proposal evaluations, but no later than **July 1, 2023** and the project will proceed immediately. Project must have completed all verification and validation testing and be ready for final acceptance by the Town on **May 1, 2024**.

APPROXIMATE BUDGET OF DESIGN & CONSTRUCTION

The budget for the design and construction is \$375,000.

TRAFFIC CONTROL/MAINTENANCE

The Town reserves the right to hire Hudson Police Department or Highway Department staff directly to reduce the cost of the traffic control/maintenance, if necessary.

PROPOSAL STATEMENT PREPARATION

In order to facilitate the evaluation of the Proposals, the Proposer is instructed to follow the outline below in responding. Proposals that do not follow the outline, or do not contain the

required information may be considered as unresponsive Proposals. Additional or more detailed information may be annexed to the main body of the Proposal. Proposals shall be submitted in **one (1) original and one (1) identical copy**.

1. Company or Contractor Team Background Material

The Proposer shall provide information concerning the background of the firm including a brief description of the firm's experience providing similar services. This shall include any proposed subcontractor or consultants that the Proposer plans to engage on this project.

2. Experience/References

The Proposer shall provide a Client reference list, with names, addresses, and telephone numbers, especially for clients whom the Proposer has provided similar services in the past. The Proposer should be able to provide a list showing that they have worked on at least one similar project in the last ten (5) years that are of similar size and scope. References shall include a brief description of the project and the services provided.

3. Project Approach

The Proposer shall provide a schedule and cost estimate of their design, including construction techniques and proposed construction materials for the new construction. The Proposer shall also describe recent similar work and any other information that the Proposer deems relevant to the project, and which the Proposer believes will further the competitiveness of the Proposal, including work samples, pictures, etc. from similar completed projects.

4. Schedule

The Proposer shall provide a brief description of their ability to meet the construction schedule set forth in this Request for Proposal. In addition, the Proposer shall provide a proposed schedule of construction.

5. Cost Proposal

Proposers shall submit a Cost Proposal in Lump Sum not to exceed format.

AWARD OF CONTRACT:

Any contract entered into by the Town shall be in response to the proposal and subsequent discussions. It is the policy of the Town that contracts be awarded, among other considerations, only to responsive and responsible Proposers. In order to qualify as responsive and responsible, a prospective Engineering Firm/Contractor must meet the following standards as they relate to this request:

- Have adequate financial resources for performance or have the ability to obtain such resources as required during performance;
- Have the necessary experience, organization, technical and professional qualifications, skills and facilities;
- Be able to comply with the proposed or required time of completion or performance schedule;
- Have a demonstrated satisfactory record of performance.
- Adhere to the specifications of this proposal and provide all documentation required of this proposal

The contract will be awarded to a responsive and responsible Proposer based on the cost and experience of the engineering firm /contractor and schedule.

The Town reserves the right to reject any or all proposals or any part thereof, to waive any formality, informality, information and/or errors in the proposal, to accept any proposal in part or in whole as may be in the best interest of the Town, or any other option if it is considered in the best interest of the Town to do so.

This solicitation requires proposing on all items, failure to do so will disqualify the proposal.

CONTRACT AWARD PROTEST POLICY AND PROCEDURE:

- a. Definitions. As used in this provision:

“Interested party” means an actual or prospective bidder whose direct economic interest would be affected by the award of the contract.

“Protest” means a written objection by an interested party to this solicitation or to a proposed or actual award of a contract pursuant to this solicitation.

- b. Protests shall be served on the Contracting Officer by obtaining written and dated acknowledgement from:

Steve Malizia, Town Administrator
Town of Hudson
12 School Street
Hudson, NH 03051

- c. All protests shall be resolved in accordance with the municipality’s protest policy and procedures, copies of which are maintained at the municipality.

MODIFICATIONS AFTER AWARD:

The Contract shall constitute the entire understanding between the parties, and it shall not be considered modified, altered, changed, or amended in any respect unless in writing and signed by the parties hereto. Such modification shall be in the form of a contract amendment executed by both parties.

CANCELLATION OF AWARD:

The Town reserves the right to cancel the award without liability to the Proposer at any time before a contract has been fully executed by all parties and is approved by the Town.

CONTRACT:

Any Contract between the Town and the Contractor shall consist of (1) the Request for Proposal (RFQ) and any amendments thereto and (2) the Contractor's proposal in response to the RFQ, (3) Form of Agreement. In the event of a conflict in language between documents (1), (2), and (3) referenced above, the provisions and requirements set forth and referenced in the RFB shall govern. However, the Town reserves the right to clarify any contractual relationship in writing and such written clarification shall govern in case of conflict. In all other matters, not affected by written clarification, if any, the RFQ shall govern. The Proposer is cautioned that this proposal shall be subject to acceptance without further clarification.

EXECUTION OF CONTRACT:

The successful Proposer shall sign (execute) the contract documents and shall satisfy all conditions set forth in the contract to enter into the contract and return such signed documents to the Town, within ten (10) calendar days from the date mailed or otherwise delivered to the successful Proposer.

APPROVAL OF CONTRACT:

Upon receipt of the contract that has been fully executed by the successful Proposer, the Town shall complete the execution of the contract in accordance with local laws or ordinances and return the fully executed contract to the Contractor. Delivery of the fully executed contract, along with a Notice to Proceed and a Town purchase order, to the Contractor shall constitute the Town's approval of the contract with the Contractor.

FAILURE TO EXECUTE CONTRACT:

Failure of the successful Proposer to execute the contract within ten (10) calendar days from the date mailed or otherwise delivered to the successful Proposer shall be just cause for cancellation of the award.

DISQUALIFICATION:

Awards will not be made to any person, firm and/or corporation that has defaulted upon a contract with the Town, the State of New Hampshire or the Federal Government within the past 5 years. Awards will not be made to any principal owner or officers that have a 10% or greater interest in a firm or corporation that has defaulted upon a contract with the Town, the State of New Hampshire or the Federal Government within the past 5 years. Corporations

must currently be in good standing with the Secretary of State's Office in the state of incorporation.

INSURANCE:

The successful Proposer shall procure and maintain insurance, in the amounts and coverage as set forth in this Request for Proposals, or otherwise required by the Town, at the Proposer's sole expense, with Town approved insurance companies, insuring against any and all public liability, including injuries or death to persons and damage to property, arising out of or related to the goods or Proposer's performance hereunder and shall furnish to the Town certificates of such insurance and renewals thereof signed by the issuing company or agent upon the Town's request. Such certificates shall name the Town of Hudson as an additional insured. Such policies shall provide for cancellation only subsequent to 30 days prior written notice to the Town and proof of subsequent insurance upon cancellation of prior policy.

The Town's examination of, or failure to request or demand, any evidence of insurance hereunder, shall not constitute a waiver of any requirement and the existence of any insurance shall not limit the Proposer's obligation under any provision hereof.

Except to the extent of comparable insurance acceptable to, or express waiver by the Town, the Proposer shall, or shall cause any carrier engaged by the Proposer, to insure all shipments of goods for full value.

If the contract with the Proposer involves the performance of work by the Proposer's employees at property owned or leased by the Town, the Proposer shall furnish such additional insurance as the Town may request in respect thereof, but in any event and without such request, workers' compensation insurance and unemployment compensation insurance as required by laws of the State of New Hampshire and public and automotive liability and property damage insurance. In no event shall such employees of the Proposer be deemed to be the employees of, or under the direction or control of the Town for any purpose whatsoever.

The Engineering firm will carry Professional Liability Insurance up to the cost of the project in addition to general liability insurance carried from the contractor.

PERFORMANCE BOND

Unless specifically waived in the Proposal, upon execution of the Contract, the successful bidder shall furnish the Town with a surety bond or bonds equal to the sum of 100 percent of the Contract amount. If a bond is used, it shall meet the following requirements:

- a. The form of the bond(s) shall be acceptable to the Town (See attached), and
- b. The bonding company issuing the bond(s) shall be licensed to transact business in the State of New Hampshire, and
- c. The bonding company issuing the bond(s) shall be listed on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on

Federal Bonds and as Acceptable Reinsuring Companies,” as published by the United States Department of the Treasury, Fiscal Service, Circular 570.

The Bonds shall guarantee the execution, faithful performance, and completion of the work to be done under the Contract, and payment in full of all bills and accounts for materials and labor used in the work. In the event the surety or bonding company fails or becomes financially insolvent, the Contractor shall file a new bond(s) in the amount designated by the Town, within 30 calendar days of such failure or insolvency.

Each bond shall clearly state the rate of premium and the total amount of premium charged. The current power of attorney for the person who signs for the surety company must be attached to the bond. The effective date of the power of attorney shall not precede the date of the bond. The effective date of the bond shall be on or after the execution date of the contract.

Failure by the successful bidder to obtain the required assurance of completion within the time specified, or within such extended period as the municipality may grant based upon reasons determined adequate by the municipality, shall render the bidder ineligible for award. The municipality may then either award the contract to the next responsible bidder or solicit new bids. The municipality may retain the ineligible bidder’s bid guarantee.

DISAGREEMENTS AND DISPUTES:

All disagreements and disputes, if any, arising under the terms of any contract, either by law, in equity, or by arbitration, shall be resolved pursuant to the laws and procedures of the State of New Hampshire, in which state any contract shall be deemed to have been executed. No action at law, or equity, or by arbitration shall be commenced to resolve any disagreements or disputes under the terms of any contract, in any jurisdiction whatsoever other than the State of New Hampshire and Hillsborough County.

TERMINATION OF CONTACT FOR CAUSE:

If the Contractor shall violate any provision of the Contract, the Town shall have the right to terminate the Contract. To terminate the Contract, the Town shall provide written notice to the Contractor of such termination. Such written notice shall state the Contract violation(s) and be delivered to the Contractor’s address as identified in the Contract Documents. This notice shall provide the Contractor with fifteen (15) calendar days from the date of delivery, to correct the violation(s) to the Town’s satisfaction. Should the Contractor fail to satisfactorily correct all violations within (15) fifteen calendar days, the Town may terminate the contract immediately upon delivery of a Notice of Termination to the Contractor. Such termination shall become effective immediately or as otherwise determined by the Town. Upon termination, all finished or unfinished work, services, plans, data programs and reports prepared by the Contractor under the Contract shall become the Town’s property. The Town may also terminate this Contract in accordance with any other applicable Contract provision.

Notwithstanding the above, the Contractor shall not be relieved of liability to the Town for damages sustained by the Town by virtue of any breach of any contract, and the Town may withhold any payments until such time as the exact amount of damages due the Town is determined.

TERMINATION FOR THE CONVENIENCE OF THE TOWN:

The Town may terminate any contract at any time by giving written notice to the Vendor of such termination and specifying the effective date thereof, at least fifteen (15) days before the effective date of such termination.

In that event, all finished or unfinished work, services, documents and materials shall become the Town's property. If any Contract is terminated by the Town as provided herein, the Vendor will be paid an amount which bears the same ratio to the total compensation as the services covered by any contract, less payments of compensation previously made.

PATENT PROTECTION:

The successful Proposer agrees to indemnify and defend the Town of Hudson from all claims and losses resulting from alleged and actual patent infringements and further agrees to hold the Town of Hudson harmless from any liability arising under RSA 382-A, 2-312 (3). (Uniform Commercial Code).

OWNERSHIP OF REPORTS:

All data, materials, plans, reports and documentation prepared pursuant to any contract between the Town of Hudson and the successful Proposer shall belong exclusively to the Town.

ASSIGNMENT PROVISION:

The successful Proposer hereby agrees that it will assign to the Town of Hudson all cause of action that it may acquire under the anti-trust laws of New Hampshire and the United States as the result of conspiracies, combination of contracts in restraint of trade which affect the price of goods or services obtained by the Town under this contract if so requested by the Town of Hudson.

PAYMENT:

Payment will be made within thirty (30) days of the completion of the work based upon the payment schedule listed in the Form of Agreement after receipt of invoice by the Town.

TAX:

The Town is exempt from all sales and Federal excise taxes. The Town's tax exemption certificate will be provided to the successful Contractor upon request. Please bill less these taxes.

FUNDING OUT:

The Town of Hudson's obligations to pay any amount due under a contract are contingent upon availability and continuation of funds for the purpose. The Town may terminate the contract at any time, due to the non-appropriation of funds, and all payment obligations of the Town cease on the date of termination.

ASSIGNMENT OR SUB-CONTRACTING:

None of the work or services covered by the contract shall be assigned in full or in part, or sub-contracted without the prior approval of the Town.

PRICING:

Unless otherwise specified all prices listed are firm for the term of the contract. All prices should include all labor, material and transportation costs, and any discounts offered. No fuel surcharges shall be allowed at any time.

AUDIT:

For a period of at least three (3) years after completion of any contract, it is the responsibility of the Contractor to make available at the Contractor's place of business, upon demand, all price lists, documents, financial records and other records pertaining to purchases made and /or work performed under contract for the purposes of audit by the Town of Hudson.

INSPECTION & EVALUATION:

The Town of Hudson reserves the right to inspect the Contractor's facilities during operating hours to determine that the level of inventory is adequate for the Town's needs. The conditions and operations of the facility shall be taken into consideration in making the award of this contract.

FUGITIVE NOISE ORDINANCES

All work shall be conducted in conformance with the Town's Code Part II General Legislation

1. Chapter 249-4, Prohibited Noise Emissions and Conditions

The Town Code can be viewed on-line at <http://ecode360.com/HU1110>

GUARANTEES & WARRANTY:

All parts and labor related to contracts must be guaranteed and include a 12 month warranty from the date of acceptance by the Town. If any work is unable to be guaranteed, the

contractor must inform the Town, in writing, prior to the delivery of an item or any work being performed. Non-guaranteed work must be offered at a discount rate from the proposal prices. **Inspection, testing and final determination of non-warranty work shall be performed at no cost to the Town.**

FORCE MAJEURE:

Neither party shall be liable for any inability to perform its' obligations under any subsequent contract due to war, riot, insurrection, civil commotion, fire, flood, earthquake, storm or other act of God.

SEVERABILITY:

If any of this Request for Proposals or subsequent contract are held to be invalid or unenforceable, it will be construed to have the broadest interpretation which would make it valid and enforceable under such holding. Invalidity or the inability to enforce a term or condition will not affect any of the other this Request for Proposals or subsequent contract.

PROVISION REQUIRED BY LAW DEEM INSERTED

Each and every provision and clause required by law to be inserted in this Request for Proposals and any subsequent Contract shall be deemed to be inserted herein and this Request for Proposals and Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Request for Proposals and/or Contract shall forthwith be physically amended to make such insertion or correction.

DISADVANTAGED BUSINESS ENTERPRISES

The Town hereby notifies all Contractors that it will affirmatively insure that in any contract entered into pursuant to this Request for Proposals, disadvantaged business enterprises will be afforded full opportunity to submit proposals in response to this request and will not be discriminated against on the grounds of race, color, national origin, religion, sex, age or disability in consideration for an award.

NON-DISCRIMINATION

Contracts for work resulting from this Request for Proposals shall obligate the Contractor and the Contractor's subcontractors not to discriminate in employment practices on the grounds of race, color, national origin, religion, sex, age or disability. Statements as to non-discriminatory practices may be requested from the successful Vendor(s).

DEFINITIONS:

Proposal shall also mean quotation, bid, offer and qualification/experience statement.

Vendors shall also mean Proposers, offerors, bidders, contractors or any person or firm responding to a Request for Proposals.

Contract shall also mean agreement.

GOVERNING LAW:

The Laws of the State of New Hampshire shall govern all contracts entered into by the Town of Hudson. Any disputes shall be resolved within the venue of the State of New Hampshire and Hillsborough County.

FAILURE TO ACKNOWLEDGE THIS REQUEST FOR PROPOSALS MAY RESULT IN WITHDRAWAL FROM THE PROPOSAL LIST FOR THIS COMMODITY OR SERVICE.

FAILURE TO COMPLY WITH THESE REQUIREMENTS COULD RESULT IN THE CANCELLATION OF AN ORDER OR CONTRACT.

PROPOSAL SUBMISSION CHECKLIST

In order to be considered responsive, each prospective vendor must submit the following documents, in **one (1) original and one (1) identical copy** as part of its proposal:

1. Proposal Document as outlined above
2. Specifications Exception Form
3. Alternate Form W-9
4. Town of Hudson Indemnification Agreement
5. Amendments, if any

The successful contractor must submit, prior to contract signing, its insurance certificate (naming the Town of Hudson) that meets the minimum required types and levels of coverage. In addition, as noted in the RFP the Contract will be required to provide and Performance bond to the Town.

PROPOSAL FORM

**DESIGN/BUILD SERVICES FOR
MARSH ROAD BOOSTER STATION – PHASE 3
TOWN OF HUDSON, NEW HAMPSHIRE**

THE UNDERSIGNED HEREBY OFFERS TO PROVIDE DESIGN AND CONSTRUCTION SERVICES THE PROJECT LISTED ABOVE FOR THE FOLLOWING PRICE.

1. Construction Services :

Design and built services for the project listed above.

\$ _____

Length of the warranty for labor shall be one year from the date of Project acceptance

Length of the warranty for materials shall be one year from the date of Project acceptance

The warranty shall include parts, labor, and travel to and from the site to remedy any warranty repairs.

The undersigned acknowledges:

1. That he/she is an authorized agent of the vendor submitting this proposal
2. The receipt of the following addenda:

3. The firm submitting this bid has never defaulted on any municipal, state, federal or private contract
4. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.
5. The undersigned hereby certifies that he (has) (has not) (CIRCLE ONE) performed work subject to the President's Executive Order No. 11246 entitled "Equal Employment Opportunity."
6. The undersigned hereby acknowledges that he has read this proposal in its entirety and understands and agrees to all provisions contained herein.

Company: _____

Signed by: _____

Printed or typed name: _____

Address: _____

Telephone number: _____ **fax number:** _____

Toll free number: _____ **e-mail:** _____

Cell phone number: _____

Primary point of contact: _____

Payment terms and conditions: _____

Please fill out, sign and return to:

Town Clerk
Chris Strout-Lizotte
12 School Street, Hudson, NH 03051
603-886-6003
cstrout-lizotte@hudsonnh.gov

Due Date/Time: April 26, 2024, Not Later Than 10:00 AM

SPECIFICATIONS EXCEPTION FORM

**DESIGN/BUILD SERVICES FOR
MARSH ROAD BOOSTER STATION - PHASE 3
TOWN OF HUDSON, NEW HAMPSHIRE**

In the interest of fairness and sound business practice, it is mandatory that you state any exceptions taken by you to our specifications.

It should not be the responsibility of the Town of Hudson to ferret out information concerning the materials, which you intend to furnish.

If your bid/quotation does not meet all of our specifications, you **must** so state in the space provided below:

Proposals on equipment, vehicles, supplies, service and materials not meeting specifications may be considered by the Town, however, all deviations must be listed above.

If your proposal does not meet our specifications, and your exceptions are not listed above, the Town of Hudson may claim forfeiture on your proposal bond, if submitted.

Signed: _____
I DO meet specifications

Signed: _____
I DO NOT meet specifications as listed in this bid; exceptions are in the space provided.

Failure to submit this form with your RFP response may result in your Proposal being rejected as unresponsive.

Name (as shown on your income tax return)		
Business name/disregard entity name, if different from above		
<input type="checkbox"/> Individual/ Sole proprietor	<input type="checkbox"/> C Corporation	<input type="checkbox"/> S Corporation
<input type="checkbox"/> Partnership	<input type="checkbox"/> Trust/estate	
<input type="checkbox"/> Limited Liability Company – Enter the tax classification (C= Corporation, S-S Corporation, P= Partnership)_____		<input type="checkbox"/> Exempt payee
<input type="checkbox"/> Other (see instructions)		
Address (number, street, and apt. or suite no.)	Requester's name and address (optional)	
City, state, and ZIP code	City of Concord 41 Green Street Concord NH 03301	
List account number(s) here (optional)		

Part I	Taxpayer Identification Number (TIN)
---------------	---

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3. **Note.** If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social Security number –	Employer identification number –
--------------------------	----------------------------------

Part II	Certification
----------------	----------------------

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions: You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here	Signature of U.S. Person	Date:
------------------	---------------------------------	--------------

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA. Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to: 1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued), 2. Certify that you are not subject to backup withholding, or 3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income. **Note.** If a requester give you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9. Pursuant to IRS Regulations, you must furnish your Taxpayer IRS Identification Number (TIN) to the City whether or not you are required to file tax returns. If this number is not provided, you may be subject to required withholding on each payment made to you. To avoid this withholding & to ensure that accurate tax information is reported to the IRS, **A RESPONSE IS REQUIRED.**

**DESIGN/BUILD SERVICES FOR
MARSH ROAD BOOSTER STATION - PHASE 3
TOWN OF HUDSON, NEW HAMPSHIRE**

**THE FOLLOWING INDEMNIFICATION AGREEMENT SHALL BE, AND IS
HEREBY A PROVISION OF ANY CONTRACT**

The successful contractor agrees to indemnify, defend and save harmless the Town, its officials, officers, agents and employees from any and all claims and losses accruing or resulting to any and all contractors, subcontractors, suppliers, laborers and any other person, firm, or corporation furnishing or supplying work, services, materials or supplies in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm or corporation which may be injured or damaged by the contractor in the performance of this contract. In any case, the foregoing provisions concerning indemnification shall not be construed to indemnify the Town for damage arising out of bodily injury to persons or damage to property caused by or resulting from the sole negligence of the Town or its employees. This indemnification shall survive the expiration or early termination of this contract.

Company_____

Taxpayer identification number_____

Authorized signature_____

Date_____

Address_____

Telephone_____

Toll-free number_____

Fax number_____

E-mail address_____

**DESIGN/BUILD SERVICES FOR
MARSH ROAD BOOSTER STATION - PHASE 3
Town of Hudson
Insurance Requirements for All Contractors**

Additional Coverage is Required if Checked *Minimum Limits Required*

Commercial General Liability

General Aggregate	\$2,000,000
Products-Completed Operations Agg.	\$2,000,000
Personal and Advertising	\$1,000,000
Each Occurrence Injury	\$1,000,000
Fire Damage (Any One Fire)	\$ 50,000
Medical Expense (Any One Person)	\$ 5,000

- Occurrence
- Claims Made

Additional Coverage to Include

- | | |
|---|----|
| <input type="checkbox"/> Owners & Contractors' Protective – Limit | NA |
| <input type="checkbox"/> Underground/Explosion and Collapse | NA |

Commercial Automobile Liability

Combined Single Limit	\$1,000,000
-----------------------	-------------

- Any Auto, Symbol 1
- Include Employees as Insured

Additional Coverage to include:

- | | |
|---|----|
| <input type="checkbox"/> Garage Liability | NA |
| <input type="checkbox"/> Garage Keepers Legal Liability | NA |

Workers Compensation

NH Statutory including Employers Liability - Each Accident/Disease-Policy Limit/Disease-Each Employee	\$100,000/\$500,000/\$100,000
--	-------------------------------

Commercial Umbrella

May be substituted for higher limits required above	\$ <u>1,000,000</u>
<input checked="" type="checkbox"/> Follow Form Umbrella on ALL requested Coverage	

Other

- | | |
|---|----|
| <input type="checkbox"/> 1. Professional/Errors & Omissions | NA |
| <input type="checkbox"/> 2. Builders Risk – Renovation Form | |
| All Risk completed value form including Collapse | NA |
| Sublimit for Soft Cost Coverage | NA |
| <input type="checkbox"/> 3. Installation Floater (Equipment) | NA |
| <input type="checkbox"/> 4. Riggers Liability | NA |
| <input type="checkbox"/> 5. Environmental – Pollution Liability | NA |
| <input type="checkbox"/> 6. Aviation Liability | NA |
| <input type="checkbox"/> 7. Watercraft – Protection & Indemnity | NA |

(X) **The Town of Hudson must be named as Additional Insured with respect to general, automobile and umbrella liability.**

NOTICE OF AWARD

Dated _____, 2024

TO: _____
(BIDDER)

ADDRESS: _____

OWNER'S PROJECT NO: _____

PROJECT: Design/Build Services for Marsh Road Pump Station – PHASE 3

OWNER'S CONTRACT NO: _____

CONTRACT FOR: Design/Build Services for Marsh Road Pump Station – PHASE 3

(Insert name of contract as it appears in the Bid Documents)

You are notified that your Bid dated _____ for the above Contract has been considered. You are the apparent successful bidder and have been awarded a contract for:

Design/Build Services for Marsh Road Pump Station

(Indicate total Work, alternates or sections of Work awarded)

The Contract Price of your contract is

_____ Dollars (\$) _____).

4 (four) copies of each of the proposed Form of Agreement, and Performance and Payment Bond forms accompany this Notice of Award.

You must comply with the following conditions precedent within **five** days of receiving this Notice of Award.

1. You must deliver to the OWNER all of the fully executed counterparts of the Agreement.
2. You must deliver with the executed Agreement the Contract Security (Bonds) as specified in the Information for Bidders and General Provisions.
3. (List other conditions precedent).

- _____
- List of suppliers
- _____
- Performance and Payment Bonds (1 copies)
- _____
- Insurance Certificates (1 copies) - **Please note that in accordance with General**
- _____
- Condition 2.1.2 of the Contract Documents, the Municipality must be named as**
- _____
- additional insureds.**
- _____
- _____
- _____
- _____
- _____
- _____

Failure to comply with these conditions within the time specified will entitle **OWNER** to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten days after receipt of acceptable performance BOND, payment BOND and agreement signed by the party to whom the Agreement was awarded, the **OWNER** will return to you one fully signed counterpart of the Agreement with the Contract Documents attached.

Town of Hudson
(OWNER)

By _____
(Authorized Signature)

(TITLE)

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

By _____

The _____ day of _____, 20 _____

By _____

Title _____

Copy to ENGINEER
 (Use Certified Mail, Return Receipt Requested)

**FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR
ON THE BASIS OF A LUMP SUM PRICE**

THIS AGREEMENT is dated as of the _____ day of _____ in the year 2024 by and between the Town of Hudson, 12 School Street, Hudson, NH (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

**DESIGN/BUILD SERVICES FOR
MARSH ROAD PUMP STATION – PHASE 3
HUDSON, NEW HAMPSHIRE**

ARTICLE 2 - ENGINEER

The Project is being managed by the Town Engineer with assistance from _____, who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3 - CONTRACT PRICE

OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount equal to the sum of the Lump Sum Cost as shown on the Proposal Form (attached).

3.1 Liquidated Damages: OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that if the Work is not completed within the times specified, plus any extensions thereof allowed in accordance with the General Conditions, the OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) the OWNER shall deduct from payments due the CONTRACTOR **Two Hundred and Fifty (\$250.00)** for each calendar day that expires past the date for each calendar day that expires after the Substantial Completion date specified, until said portions of the work have been completed. If payments due the CONTRACTOR are less than the amount of such liquidated damages, said damages shall be deducted from any other monies due or to become due the CONTRACTOR, and then the CONTRACTOR or his Surety shall pay the balance to the OWNER.

- 3.2 In addition to the above, if the Contract is not completed within the time specified and no extension of time is authorized by the OWNER, the CONTRACTOR shall indemnify the OWNER for costs to the OWNER of additional engineering work required during any such extension period.

ARTICLE 4 - PAYMENT PROCEDURES

CONTRACTOR shall submit Applications for Payment in accordance with the General Conditions and Supplemental Conditions. Applications for Payment will be processed by ENGINEER as follows:

- Payment will be made within thirty (30) days of submittal

The Town waives any retainage requirement for this project. All payments to the Contractor will be based on the payment schedule noted above.

ARTICLE 5 - INTEREST

All monies not paid when due as provided in the General Conditions shall bear interest at the maximum rate allowed by law at the place of the Project.

ARTICLE 6 - CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

- 7.1 CONTRACTOR has examined and carefully studied the Contract Documents including the Addenda and the other related data identified in the Bidding Documents including "technical data".
- 7.2 CONTRACTOR has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work.
- 7.3 CONTRACTOR is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.
- 7.4 CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. CONTRACTOR does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.

- 7.5 CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- 7.6 CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 7 - CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

- 7.1 Request for Proposal RFP 2024.
- 7.2 Town of Hudson required contract forms:
- a.) Proposal Document
 - b.) Specifications Exception Form
 - d.) Alternate Form W-9
 - e.) Indemnification Agreement
 - f.) Amendment, if any
- 7.3 Bid Bond.
- 7.4 Notice of Award.
- 7.5 This Agreement.
- 7.6 Performance Bond.
- 7.7 CONTRACTOR's Proposal.
- 7.8 Documentation submitted by CONTRACTOR prior to Notice of Award (pages __ to ____, inclusive).
- 7.9 The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying or supplementing the Contract Documents pursuant to the General Conditions.

ARTICLE 8 - MISCELLANEOUS

- 8.1 Terms used in this Agreement which are defined in the General Conditions will have the meanings indicated in the General Conditions.
- 8.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without written consent of the party sought to be bound; and, specifically but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 8.3 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.
- 8.4 Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed, initialed or identified by OWNER and CONTRACTOR or identified by ENGINEER on their behalf.

This Agreement will be effective on _____, 20__ (which is the Effective Date of the Agreement).

OWNER Town of Hudson

CONTRACTOR _____

By: _____

By: _____

Print Name _____

Print Name _____

Title: _____

Title: _____

STATE OF NEW HAMPSHIRE
COUNTY OF _____

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ day of _____, 2024, by _____, duly authorized _____ of _____, a New Hampshire corporation, on behalf of same.

The foregoing instrument was acknowledged before me this ____ day of _____ 2024, by _____, duly authorized _____ of _____, a _____ corporation, on behalf of same.

Justice of the Peace/Notary Public

Justice of the Peace/Notary Public

Address for giving notices:

Address for giving notices:

Town of Hudson, 12 School Street,

Hudson, New Hampshire

(If OWNER is a public body, attach evidence of authority to sign and resolution of other documents authorizing execution of Agreement.

NH License No.: _____

Agent for service of process: _____

(If CONTRACTOR is a corporation, attach evidence of authority to sign).

BID BOND

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable.

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

BID

Bid Due Date:

Project (Brief Description Including Location):

BOND

Bond Number:

Date (Not later than Bid due date):

Penal Sum: _____

(Words)

_____ (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: Above addresses are to be used for giving required notice.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder any difference between the total amount of Bidder's Bid and the total amount of the Bid of the next lowest, responsible Bidder who submitted a responsive Bid as determined by Owner for the work required by the Contract Documents, provided that:

- 1.1. If there is no such next Bidder, and Owner does not abandon the Project, then Bidder and Surety shall pay to Owner the penal sum set forth on the face of this Bond, and
- 1.2. In no event shall Bidder's and Surety's obligation hereunder exceed the penal sum set forth on the face of this Bond.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

- 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
- 3.2. All Bids are rejected by Owner, or
- 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state

in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____ (Name of Contractor)

_____ (Address of Contractor)

a _____, hereinafter called Principal,
(Corporation, Partnership or Individual)

and _____
(Name of Surety)

_____ (Address of Surety)

hereinafter called Surety, are held and firmly bound unto

Town of Hudson, NH

_____ (Name of Owner)

12 School Street, Hudson, NH 03051

_____ (Address of Owner)

hereinafter called **OWNER**, in the total aggregate penal sum of _____ Dollars, \$ (_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators' successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the **OWNER**, dated the _____ day of _____ 20 ____, a copy of which is hereto attached and made a part hereof for the construction of:

Design/Build Service For Marsh Road Water Pump Station – PHASE 3

Hudson, NH

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

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the specifications accompanying same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time alteration or addition to the terms of the contract or to the WORK or to the specifications.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the contract or the loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each of which shall be deemed an original, this _____ day of _____, 20 ____ .

ATTEST:

By: _____
(Principal) Secretary

(SEAL)

Principal

BY

(Address)

By: _____
Witness as to Principal

(Address)

(Surety)

ATTEST:

By _____
Witness as to Surety

(Address)

BY

Attorney - in - Fact

(Address)

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR is Partnership, all partners should execute BOND

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of New Hampshire

**GENERAL CONDITIONS OF THE
CONTRACT FOR CONSTRUCTION**

**DESIGN/BUILD SERVICES
MARSH BOOSTER STATION-PHASE 3**

Hudson, NH

MARCH 2024



Prepared by:

**Engineering Department
12 School Street
Hudson, NH 03051**

General Conditions

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ARTICLE 1 – DEFINITIONS

1.1 GENERAL

The most recent date of issue of publications referenced by the contract documents, including interim publications, that precedes the date of receipt of bid for the Project shall apply unless stated otherwise in the contract documents.

1.1.1 Acceptance. The formal written acceptance by the Municipalities of the contract work as described herein which has been completed in all respects in accordance with the Plans and Specifications and any modifications previously approved.

1.1.2 Addendum (addenda). Contract revisions developed after advertisement and before opening Bids.

1.1.3 Advertisement. A public announcement, inviting Bids for work to be performed or materials to be furnished.

1.1.4 Agreement. The written instrument which is evidence of the agreement between the Municipalities and Contractor.

1.1.5 Approved Material. 1. Material obtained from within the limits of the Project or from outside sources suitable for the intended use and approved by the Engineer. 2. Manufactured material approved by the Engineer for use in the work.

1.1.6 Award The acceptance of a proposal by the Municipalities.

1.1.7 Bid. The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

1.1.8 Bid Bond. A proposal guarantee as outlined in the Instructions to Bidders for Contracts.

1.1.9 Bidder. The individual, partnership, firm, corporation, or any combination thereof, or joint venture, submitting a Bid in accordance with the bidding requirements.

1.1.10 Bidding Requirements. The advertisement or invitation to Bid, instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

1.1.11 Change Order. A document recommended by the Engineer, signed by the Contractor and Municipalities authorizing changes in the plans or quantities or both, within the scope of the Contract, and establishing the basis of payment and time adjustments for the Work affected by the changes.

1.1.12 Completion. Completion of the Project occurs when the Contractor has completed all work required by the Contract and has satisfactorily executed and delivered

to the Engineer all documents, certificates and proofs of compliance required by the Contract.

1.1.13 Construction Zone. The area shown on the plans in which the contract work is to be performed.

1.1.14 Contract. The written agreement between the Municipalities and the Contractor setting forth the obligations of the parties there under, including, but not limited to the performance of the Work and the basis of payment.

1.1.15 Contract Bonds: The approved form of security including a Performance Bond and a Labor and Materials Payment Bond executed by the Contractor and his Surety or Sureties, guaranteeing complete execution of the Contract and all supplemental agreements pertaining thereto, including the payment of all legal debts pertaining to the construction of the project.

1.1.16 Contract Documents. Those items so designated in the Agreement. Including but not limited to information supplied to bidders, bid, bid bond, Agreement, payment bond, performance bond, notice of award, notice to proceed, change orders, drawings, specifications and addenda.

1.1.17 Contract Administrator/Project Engineer. The field representative of the Engineer having direct supervision of the administration of the Contract.

1.1.18 Contract Price. Those monies payable to the Contractor pursuant to the Contract terms for completion of the Work as stated in the Agreement.

1.1.19 Contract Time. The time allowed for completion of the contract, including authorized time extensions.

1.1.20 Contractor/Prime Contractor. The individual or entity with whom the Municipalities has entered into Agreement.

1.1.21 Day. Unless otherwise indicated, this term will mean a calendar day.

1.1.22 Delay. Any event, action, force, or factor that causes the established Contract Time to be exceeded for performance of the Contract.

1.1.23 Department/Municipalities/Owner. The Municipalities designated as the party of the first part to the Contract .

1.1.24 Differing Site Conditions. Subsurface or latent physical conditions that, (1) differ materially from those indicated in the Contract, or (2) differ materially from conditions normally encountered or those conditions generally recognized as inherent in the nature of the Work required in the Contract, or (3) are unknown conditions of an unusual nature.

1.1.25 Engineer. The New Hampshire licensed Engineering Firm or Engineer with whom the Municipalities has contracted, who is responsible for engineering supervision of the work, acting directly or through his duly authorized representatives.

1.1.26 Expression. By or to the Engineer. In order to avoid cumbersome and confusing repetition of expressions in these specifications, it is hereby provided that any and all of the following words or any form of such words, unless clearly indicated otherwise, shall be understood to be followed by the words “by the Engineer” or “to the Engineer”:
Accepted, approved, authorized, condemned, considered, or deemed necessary, contemplated, designated, determined, directed, disapproved, established, given, indicated, insufficient, ordered, permitted, rejected, required, reserved, satisfactory, specified, sufficient, suitable, suspended, unacceptable or unsatisfactory.

1.1.27 Extra Work. Work performed by the Contractor not originally specified in the Contract, but found essential to the satisfactory completion of the project.

1.1.28 Force Account. A basis of payment for the directed performance of Work with payment based on the actual cost for labor, materials, and equipment with consideration for overhead and profit.

1.1.29 Hazardous Material (toxic waste). Shall mean material as defined by RSA 147-A.

1.1.30 Major and Minor Contract Items. Any contract item having an original value in excess of five percent of the original Contract total for contracts of \$1,000,000.00 or less, or three percent of the original Contract total for contracts greater than \$1,000,000.00 shall be considered as a major item or items. All other contract items are considered as minor.

1.1.31 Notice to Proceed. Written notice to the Contractor to proceed with the Contract work, including the beginning of Contract time when applicable.

1.1.32 Project. The specific section(s) of the Municipal facilities together with all appurtenances to be constructed under the Contract.

1.1.33 Proposal Form. The prescribed form on which the Municipalities requires the Bid be submitted.

1.1.34 Prosecution of Work. A document included in the Contract which gives the Contractor specific requirements and information unique to the Project, allowing for the satisfactory performance of the Work. It also includes the final and any intermediate completion dates.

1.1.35 Qualified Products List (QPL). A list of products prequalified by the Engineer as meeting the Contract requirements for specified materials to be incorporated into the Work. The list is maintained and updated yearly by the NHDOT Bureau of Materials and Research.

- 1.1.36 Site.** The Project area provided to perform the Work.
- 1.1.37 Solid Waste.** Shall mean material as defined by RSA 149-M.
- 1.1.38 Special Attentions.** Notices calling bidders' attention to issues applicable to an individual project.
- 1.1.39 Special Provisions.** Additions and revisions to the Standard and Supplemental Specifications applicable to an individual project.
- 1.1.40 Specifications.** The compilation of Standard Specifications (including these Municipal General Conditions), Supplemental Specifications, Special Provisions, Special Attentions and other requirements for the performance of prescribed work.
- 1.1.41 Specified Completion Date.** The date on which the Contract work is specified to be completed.
- 1.1.42 Storm Water Pollution Prevention Plan, (SWPPP).** Per Environmental Protection Agency requirements.
- 1.1.43 Subcontractor.** An individual, partnership, firm, corporation, or any combination thereof, or joint venture, to which the Contractor sublets any part of the Contract.
- 1.1.44 Subsidiary and Subsidiary Item.** These terms are used to indicate work for which no direct payment will be made. Such work is considered to be incidental to items having contract prices, and the bid prices submitted by the Contractor shall be sufficient to absorb the cost of all work designated as subsidiary or as subsidiary items.
- 1.1.45 Superintendent.** The Contractor's authorized representative in responsible charge of the work.
- 1.1.46 Supplementary Agreement.** A written agreement recommended by the Engineer, between the Contractor and the Municipalities, for the performance of work by the Contractor at agreed prices under items not originally included in the Contract.
- 1.1.47 Surety.** The corporation, partnership, or individual, other than the Contractor, executing a bond furnished by the Contractor.
- 1.1.48 Traffic Control Plan (TCP).** A document included in the Contract which gives the Contractor specific requirements and procedures for controlling traffic during the course of construction. It also allows the Contractor to submit for approval variations of such plan.
- 1.1.49 Wetland.** "An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wetlands include, but are not limited to swamps, marshes, bogs, and similar areas.” (NH Code of Administrative Rules, Chapter Wt 101.87, 1997)

1.1.50 Work. The furnishing of all labor, materials, equipment, and incidentals necessary or convenient to the successful completion of the Project, and the carrying out of the duties and obligations imposed by the Contract.

1.1.51 Working Drawings. Temporary bridge plans, cofferdam plans, water diversion structure plans, plans of precast elements to be designed by the Contractor, shop fabrication drawings, erection plans, falsework plans, temporary support systems, bending diagrams when required for reinforcing steel, scaffolding plans and bridge analysis, detour plans, sign structure plans, traffic signal poles and mast arm plans, Storm water Pollution Prevention Plan (SWPPP), erosion control plans, or any other supplementary plans or similar data required of the Contractor to control the Work and its prosecution.

ARTICLE 2 - PRELIMINARY MATTERS

2.1 DELIVERY OF BONDS AND EVIDENCE OF INSURANCE

2.1.1 Concurrent with the execution of the Construction Contract, Contractor shall deliver to the Municipality such bonds as may be required by the Contract. Performance and Labor and Material Payment Bonds will be provided, unless specifically deleted by the Invitation for Bids.

2.1.2 Prior to the start of Work, the Contractor shall deliver to the Municipality proof of insurance as required under the Contract including but not limited to certificates of insurance naming the Municipality and its agents/consultants as additional insureds.

2.1.3 The Contractor shall indemnify, defend and save-harmless the Municipality and their officers, agents, and employees from and against any and all claims, liabilities, suits or penalties arising out of (or which may be claimed to arise out of) negligent acts or omissions of the Contractor or Subcontractors in the performance of Work covered by the Contract. This responsibility shall survive the termination of the Contract. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the Municipality, which immunity is hereby reserved by the Municipality.

2.1.4 Liability insurance for damages imposed by law of the kinds and amounts specified herein shall be obtained and maintained by the Contractor. The insurance obtained shall cover all operations under the Contract whether performed by the Contractor or Subcontractor of any tier and shall be maintained until Acceptance.

2.1.5 Each policy shall contain a clause prohibiting cancellation or modifications of the policy earlier than 30 days, or 10 days in cases of non-payment of premium, after written notice thereof has been received by the Municipality.

2.1.6 All insurance requirements shall be the responsibility of the Contractor. The Contractor shall require Subcontractors to maintain similar coverage.

2.1.7 It is specifically agreed between the parties executing this Contract that it is not intended by the Contract provisions to make the public or any member thereof a third party beneficiary hereunder, or to authorize anyone not a party to the Contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the Contract. The duties, obligations, and responsibilities of the parties to this Contract with respect to third parties shall remain as imposed by law.

2.1.8 Insurance coverage shall be consistent with limits outlined in Subsection 107.11 of the NHDOT Standard Specifications for Road and Bridge Construction.

2.2 HAZARDOUS MATERIALS

2.2.1 . The Contractor shall also be aware of laws and regulations relating to hazardous materials which may be encountered during construction operations, either within project limits or at material sites off the project. The health and safety of employees, the general public, and the potential of damage to the overall environment is possible if hazardous materials are not recognized, reported, and the appropriate action taken to dispose of, remove from the site, or otherwise contain the possible contaminants.

2.2.2 State laws such as RSA 141-E, Asbestos Management and Control RSA 147-A, Hazardous Waste Management, and RSA 149-M, Solid Waste Management identify the major areas of concern. Parts Env-Wm 100-110, Env-Wm 101-300, 2100-3700, and Env-Wm 3900 of the New Hampshire Code of Administrative Rules identify various contaminants related to hazardous waste, solid waste, solid waste and asbestos and their management, respectively.

2.2.3 If any abnormal condition is encountered or exposed that indicates the presence of a hazardous material or toxic waste, construction operations shall be immediately suspended in the area and the Engineer notified. No further work shall be conducted in the area of the contaminated material until the site has been investigated and the Municipalities have given approval to continue the work in the area. The Contractor shall fully cooperate with the Engineer and perform any remedial work as directed. Work shall continue in other areas of the Project unless otherwise directed.

2.2.4 Exposure to hazardous materials may result from contact with, but not necessarily limited to, such items as drums, barrels, other containers, waste such as cars, batteries, and building construction debris. Containers leaking unknown chemicals or liquids, abandoned cars leaking petroleum products, batteries leaking acid, construction debris which may include asbestos, or any other source of suspected hazardous material found within excavation areas or stockpiled on land within construction limits shall be referred to the Department of Environmental Services so that a proper identification of the materials may be made and disposal procedures initiated as required.

2.2.5 Disposition of the hazardous material or toxic waste shall be made under the requirements and regulations of the Department of Environmental Services. Work required to dispose of these materials shall be performed under a Supplemental Agreement or Contract item, if included in Contract. If the waste material disposal requires special procedures, the Municipalities will make arrangements to dispose of the material, either by the Contractor or by other parties.

2.3 COMMENCEMENT OF CONTRACT TIMES

2.3.1 Execution and Approval of Contract. The signed Contract, together with the Contract Bond, certificate of insurance and the Disadvantaged Business Enterprise forms, if required, shall be returned to the Municipalities within 10 days after the date of notice that the Proposal has been accepted. The Contract will not be considered approved until it has been fully executed by all of the parties to the Contract.

2.3.2 Failure to Execute Contract. If the successful bidder fails to execute the Contract and file acceptable bond within 5 days after the date of notice of acceptance of the Proposal, the Municipalities may cancel the notice of award and retain the bidder's Proposal Guarantee which shall become the property of the Municipalities, not as a penalty, but in liquidation of damages sustained. Contract award may then be made to the next lowest responsible bidder or the Work may be readvertised.

2.3.3 Contract Time/Notice to Proceed. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the 90th day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.3.4 Starting the Work. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.4 BEFORE CONSTRUCTION BEGINS

2.4.1 Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2.4.2 Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

2.4.3 A preconstruction conference shall be held by the Contractor prior to the Work commencing. At this time the Contractor shall submit to the Engineer and Municipalities

for approval a Progress Schedule outlining the intended schedule of the Work. All parties of interest including but not limited to utilities, Municipal officials, sub-contractors, etc. shall be invited to attend.

ARTICLE 3 - CONTRACT DOCUMENTS

3.1 INTENT OF CONTRACT

3.1.1 The intent of the Contract is to provide for the construction and completion in every detail of the work it describes. The Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the Work under the Contract.

3.1.2 Clarifications and/or interpretations of the Contract Documents shall be at the discretion of the Engineer. All requests by Contractor for same shall be made in writing to the Engineer.

3.1.3 The Specifications, Supplemental Specifications, Plans, Special Provisions, other special Contract requirements and all supplemental documents are essential parts of the Contract and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete Contract. In case of discrepancy between these Contract documents, calculated dimensions, unless obviously incorrect, will govern over scaled dimensions and the parts of the Contract will prevail in the following descending order:

Municipal General Conditions; Special Contract Requirements; Special Provisions; Plans; Supplemental Specifications; Standard Specifications including Standard Details, Standard Plans; Including, but not limited to, Special Attentions in the mentioned descending order.

3.1.4 To the extent applicable no Local, State or Federal code and/or regulation will be deemed waived as a result of the conditions and /or specifications contained herein.

3.1.5 Conflicts between the requirements of these General Conditions and specifications incorporated herein including but not limited to the NHDOT Standard Specifications for Road and Bridge Construction as it may be amended shall be interpreted to the benefit of the Municipalities at its sole discretion unless the Contractor notifies Municipalities of said conflict prior to submission of bids. If notified in writing of a conflict in specifications prior to bid the Municipalities shall take such action as it deems appropriate.

ARTICLE 4 - SUSPENSION OF WORK

4.1 MUNICIPALITIES MAY SUSPEND WORK

4.1.1 Municipalities may suspend all or any portion of the Work for any reason during performance of the Contract. Suspension of all or any portion of the Work will be done by written notice to the Contractor.

4.1.1.1 If the suspension or delay resulting from the written order is considered unreasonable, or not customary, or inherent to the construction industry; the Contractor shall submit a written request providing the reasons and justification for any Contract adjustment considered necessary as a result of the suspension or delay. The written request for Contract adjustment must be submitted to the Engineer in writing within seven days following receipt of the notice to resume work. A Contract adjustment will not be made unless the request for adjustment has been submitted within the prescribed time.

4.1.1.2 There will be no Contract adjustment under the provisions of this Subsection if the Work would have been suspended or delayed by any other cause, or for which an adjustment is provided for, or excluded under any other term or condition of the Contract.

4.1.1.3 The request for a Contract adjustment will be reviewed by the Engineer. If there is agreement that, (1) there has been an increase in the Contract performance cost or time as a result of such suspension and (2) the suspension was caused by conditions beyond the control of and not the fault of the Contractor, Contract suppliers, or subcontractors at any approved tier; and not caused by weather, an adjustment will be made to the Contract by Change Order.

ARTICLE 5 - CHANGES IN THE WORK

5.1 DIFFERING SITE CONDITIONS

5.1.1 If differing site conditions are encountered at the work site, the Contractor shall promptly notify the Municipalities and Engineer in writing. No further disturbance of the site or performance of the affected work is to be done after the alleged differing site conditions are noted unless directed otherwise in writing by the Engineer. If the Municipalities and Engineer determine the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment, excluding loss of anticipated profits, will be made and the Contract modified in writing accordingly. The Engineer will notify the Contractor whether or not an adjustment in the Contract is warranted.

5.1.2 After receipt of written notice as required by paragraph 5.1.1, Engineer will promptly review the pertinent condition, determine the necessity of obtaining additional exploration or tests with respect thereto, and advise Municipalities in writing (with a copy to Contractor) of Engineer's findings and conclusions.

5.2 EXTRA WORK

5.2.1 Extra Work shall be performed by the Contractor in accordance with the Specifications and as directed, and will be paid for as provided herein. When the Contract provides for payment of certain work under Extra Work, no further order from the Engineer will be necessary for such work; otherwise, when the Engineer determines that Extra Work is to be performed, an Extra Work Order will be issued.

5.2.2 The Contract Price or the Contract Times, or both, may be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

5.2.2.1 Contractor knew or should have known of the existence of such conditions at the time Contractor made a final commitment to Municipalities respect of Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

5.2.2.2 The existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

5.2.2.3 Contractor failed to give prompt written notice as required by paragraph 5.1.

5.2.3 If Municipalities and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefore as provided herein. However, Municipalities, Engineer, and Engineer's Consultants shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

5.3 CHANGES IN CHARACTER OF WORK

5.3.1 The Engineer reserves the right to provide written notice to the Contractor at any time during the Contract to change Major Item quantities or make other alterations considered necessary to satisfactorily complete the Contract.

5.3.2 Such changes in quantities and alterations do not invalidate the Contract nor release the Contract Surety.

5.3.3 If the directed changes require additional time to complete the Contract, adjustments in the Contract Time shall be determined by the Engineer.

5.3.4 Payments for the alterations in the Work or changed Major Item quantities will be made as provided under Article 9.

5.3.5 The basis of the Contract adjustment shall be agreed upon before the performance of the Work. If a basis cannot be agreed upon, prosecution of the Work may be ordered by the Municipalities under the Force Account provisions of Subsection 9.4.3.3.

ARTICLE 6 - SCOPE OF WORK

6.1 MAINTENANCE OF TRAFFIC

6.1.1 The Contractor shall keep all roads open to all traffic during construction. The Contractor shall keep the signals operational during construction. Where provided in the Contract, or approved by the Engineer, traffic may be bypassed over an approved detour route. In the event a Contractor proposes to construct detours not shown on the Plans, the Contractor shall submit proposed detour plans for documentation, showing the proposed location, alignment, grade, cross section, and signing. All detours shall be kept in a safe and adequate condition. The Contractor shall furnish, erect, and maintain barricades, warning signs, delineators, striping, flaggers, and pilot cars in accordance with the MUTCD and Sections 618, 619 and 632 of the New Hampshire Department of Transportation Standard Specifications for Road and Bridge Construction. The Contractor shall bear all expense of maintaining the section of road undergoing improvement including all temporary approaches or crossings and intersections with trails, roads, streets, abutters, and other features as may be necessary. Payment for the furnishing, installation, and maintenance of traffic control will be as provided in the Agreement. No other additional compensation for maintenance will be made.

6.1.2 The Contractor shall make passable and open to traffic the sections of the project and temporary roadways as agreed upon between the Contractor and the Engineer for the accommodation of necessary traffic during the anticipated period of suspension. During this suspension period the maintenance of the temporary roadway and sections of the Project will be the responsibility of the Contractor.

6.1.3 When Work is suspended due to seasonal or climatic conditions or, for failure to correct conditions unsafe for the workers or the general public, for failure to carry out orders of the Engineer or for other reasons caused by the Contractor, all costs for maintenance of the roadway to accommodate traffic during the suspended period shall be borne by the Contractor.

6.2 CONTRACTOR'S RESPONSIBILITIES

6.2.1 Until Acceptance of the project by the Engineer, the Contractor is responsible for and shall protect the Work against injury or damage from all causes whether arising from the execution or the nonexecution of the Work except as provided herein.

6.2.2 The Contractor, at his or her expense, shall rebuild, repair, restore, and make good all losses, injuries, or damage to any portion of the Work from any cause before Acceptance, except for loss, injury or damage due to causes not under the control and without the fault or negligence of the Contractor. Such causes include, but are not restricted to, natural disasters such as earthquake, tidal wave, tornado, hurricane, or other cataclysmic phenomenon of nature; acts of a public enemy; acts of governmental authorities; and errant vehicles. The Contractor shall repair damage due to such excepted causes and shall be paid at the contract prices or in the same manner as Extra Work as determined and ordered by the Engineer. Causes under the control of the Contractor shall be any cause that he or she could have prevented by reasonable and foreseeable action and shall include damage caused by normal weather conditions.

6.2.3 In case of suspension of the Work from any cause, the Contractor is responsible for the Work under the Contract and shall prevent damage to the project, provide for normal drainage, and erect necessary temporary structures, signs, or other facilities. The Contractor shall also maintain in an acceptable growing condition all living material in newly established plantings, seedings, and soddings furnished under the Contract, and protect new tree growth and other designated vegetative growth against injury. When work is suspended for reasons of differing site conditions, the costs during the period of suspension shall be borne by the Contractor.

6.2.4 The Contractor shall comply with all Federal, State, and local laws and regulations controlling pollution of the environment. Pollution of streams, lakes, ponds and reservoirs with fuels, oils, bitumens, chemicals, or other harmful materials and pollution of the atmosphere from particulate and gaseous matter shall be avoided to the extent practicable.

6.2.5 Work performed and materials furnished shall be uniform in character and meet the Contract dimensions and material requirements according to tolerances specified in the Contract. If tolerances are specified, deviations beyond the specified limits will be unacceptable. When tolerance limits are not specified, and only single dimensions are indicated, such dimensions are to be regarded as nominal dimensions. If the materials furnished, work performed, or the finished product does not conform to the Contract, but adequately addresses the design purpose, the Engineer will determine the conditions under which the Work will be accepted and allowed to remain in place unless there are other provisions in the Contract that provide for this determination. Where this determination is made by the Engineer rather than Contract provisions, the Engineer will document the basis of acceptance by Contract modification. The modification will provide for an appropriate adjustment in the Contract price for such work or materials as necessary to support the Engineer's determination.

6.3 SUPERVISION OF WORK

6.3.1 Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor

shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but Contractor shall not be responsible for the negligence of Municipalities or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. Contractor shall be responsible to see that the completed Work complies accurately with the Contract Documents.

6.3.2 At all times during the progress of the Work, Contractor shall assign a competent resident superintendent thereto who shall not be replaced without written notice to Municipalities and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

6.4 LABOR

6.4.1 Contractor shall provide competent, suitably qualified personnel to survey, layout, and construct the Work as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

6.4.2 Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, and Contractor will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without Municipalities' written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.5 SERVICES, MATERIALS, AND EQUIPMENT

6.5.1 Unless otherwise specified in the General Requirements, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

6.5.2 All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of Municipalities. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.6 SCHEDULE OF WORK

6.6.1 Contractor shall adhere to the progress schedule established in accordance with Article 2.4.3 as it may be adjusted from time to time as provided below.

6.6.1.1 Contractor shall submit to Engineer for acceptance proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

6.6.1.2 Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 2. Such adjustments may only be made upon written approval of the Engineer.

6.7 SUBSTITUTES AND "OR - EQUALS"

6.7.1 Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

6.7.1.1 "Or – Equals": If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

6.7.1.1(a) in the exercise of reasonable judgment the Engineer determines that: (i) it is at least equal in quality, durability, appearance, strength, availability, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; (iii) it has a proven performance record; and

6.7.1.1(b) Contractor certifies that: (i) there is no increase in cost to the Municipalities or increase in Contract Times; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

6.7.1.2 Substitute Items:

6.7.1.2(a) If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under paragraph 6.7.1, it will be considered a proposed substitute item.

6.7.1.2(b) Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

6.7.1.2(c) The procedure for review by Engineer will be as set forth in paragraph 6.7.1.2.(d), as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

6.7.1.2(d) Contractor shall first make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Municipalities for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by Engineer in evaluating the proposed substitute item. Engineer may require Contractor to furnish additional data about the pro-posed substitute item.

6.7.2 If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is

equivalent to that expressly called for by the Contract Documents. The procedure for review by Engineer will be similar to that provided in subparagraph 6.7.1.2(d).

6.7.3 Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraph 6.7. Engineer will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

6.7.4 Special Guarantee: Municipalities may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

6.7.5 Engineer's Cost Reimbursement: Engineer will record time required by Engineer and Engineer's Consultants in evaluating substitute proposed or submitted by Contractor pursuant to paragraphs 6.7.1.1 and 6.7.1.2 and in making changes in the Contract Documents (or in the provisions of any other direct contract with Municipalities for work on the Project) occasioned thereby. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor may reimburse Municipalities for the charges due Engineer and Engineer's Consultants for evaluating each such proposed substitute.

6.7.6 Contractor's Expense: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.8 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS

6.8.1 Contractor shall not employ any Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, against whom Municipalities may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

6.8.2 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Municipalities in advance for acceptance by Municipalities by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Municipalities' acceptance (either in writing or by failing to make written objection thereto) by the date indicated for of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by Municipalities of any such Subcontractor, Supplier, or other

individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Municipalities or Engineer to reject defective Work.

6.8.3 Contractor shall be fully responsible to Municipalities and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Municipalities or Engineer and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of Municipalities or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

6.8.4 Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

6.8.5 Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

6.8.6 The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

6.8.7 All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Municipalities and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance required herein, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Municipalities, Contractor, Engineer, Engineer's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.9 PATENT FEES AND ROYALTIES

6.9.1 Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention,

design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Municipalities or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Municipalities in the Contract Documents. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Municipalities, Engineer, Engineer's Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.10 PERMITS

6.10.1 Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Municipalities shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Municipalities shall pay all charges of utility owners for connections providing permanent service to the Work.

6.11 LAWS AND REGULATIONS

6.11.1 Contractor shall give all notices and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Municipalities nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

6.11.2 If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations herein.

6.11.3 Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work may be the subject of an adjustment in Contract Price or Contract Times. If Municipalities and Contractor are unable to agree on entitlement to or

on the amount or extent, if any, of any such adjustment, a Claim may be made therefore as provided herein.

6.12 TAXES

6.12.1 Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.13 USE OF SITE AND OTHER AREAS

6.13.1 Limitation on Use of Site and Other Areas

6.13.1.1 Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

6.13.1.2 Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

6.13.1.3 To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Municipalities, Engineer, Engineer's Consultant, and the officers, directors, partners, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Municipalities, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

6.13.2 During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

6.13.3 Prior to Substantial Completion of the Work Contractor shall clean the Site and make it ready for utilization by Municipalities. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

6.13.4 Loading Structures: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.14 RECORD DOCUMENTS

6.14.1 Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Municipalities.

6.15 SAFETY

6.15.1 Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

6.15.1.1 all persons on the Site or who may be affected by the Work;

6.15.1.2 all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

6.15.1.3 other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated-for removal, relocation, or replacement in the course of construction.

6.15.2 Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Municipalities of adjacent property and of Underground Facilities and other utility Municipalities when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property referred to herein, caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Municipalities or Engineer or Engineer's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual

or entity directly or indirectly employed by any of them). Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Municipalities and Contractor as required herein that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.16 SAFETY REPRESENTATIVE

6.16.1 Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.17 HAZARD COMMUNICATION PROGRAMS

6.17.1 Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.18 EMERGENCIES

6.18.1 In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Change Order will be issued.

6.19 SHOP DRAWINGS AND SAMPLES

6.19.1 Contractor shall submit Shop Drawings to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as Engineer may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by paragraph 6.19.5

6.19.2 Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, supplier, pertinent data such as catalog numbers, and the use for which intended, and otherwise as Engineer may require to enable Engineer to review the submittal for the limited purposes required by paragraph

6.19.5. The numbers of each Sample to be submitted will be as specified in the Specifications.

6.19.3 Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to Engineer as required herein, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

6.19.4 Submittal Procedures

6.19.4.1 Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

6.19.4.1(a) all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

6.19.4.1(b) all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

6.19.4.1(c) all information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto; and

6.19.4.1(d) Contractor shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

6.19.4.2 Each submittal shall bear a stamp or specific written indication that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

6.19.4.3 At the time of each submittal, Contractor shall give Engineer specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to Engineer for review and approval of each such variation.

6.19.5 Engineer's Review

6.19.5.1 Engineer will timely review and approve Shop Drawings and Samples in accordance with the Contractor's schedule of Shop Drawings and Sample submittals acceptable to Engineer (expected review time shall never be less than 10 days). Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work,

conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

6.19.5.2 Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

6.19.5.3 Engineer's review and approval of Shop Drawings or Samples shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has in writing called Engineer's attention to each such variation at the time of each submittal as required by paragraph 6.19.4 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by Engineer relieve Contractor from responsibility for complying with the requirements of paragraph 6.19.4.

6.19.6 Resubmittal Procedures

6.19.6.1 Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.20 CONTINUING THE WORK

6.20.1 Contractor shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with Municipalities. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted herein or as Municipalities and Contractor may otherwise agree in writing.

6.21 GENERAL WARRANTY AND GUARANTEE

6.21.1 Contractor warrants and guarantees to Municipalities, Engineer, and Engineer's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

6.21.1.1 abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

6.21.1.2 wear and tear under normal usage.

6.21.2 Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

6.21.2.1 observations by Engineer;

6.21.2.2 recommendation by Engineer or payment by Municipalities of any progress or final payment;

6.21.2.3 the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Municipalities;

6.21.2.4 use or occupancy of the Work or any part thereof by Municipalities;

6.21.2.5 any acceptance by Municipalities or any failure to do so;

6.21.2.6 any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6.21.2.7 any inspection, test, or approval by others; or

6.21.2.8 any correction of defective Work by Municipalities.

6.22 INDEMNIFICATION

6.22.1 To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Municipalities, Engineer, Engineer's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:

6.22.1.1 is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom; and

6.22.1.2 is caused in whole or in part by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or

whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.

6.22.2 In any and all claims against Municipalities or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.22.1 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

6.22.3 The indemnification obligations of Contractor under paragraph 6.22.1 shall not extend to the liability of Engineer and Engineer's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:

6.22.3.1 the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications;
or

6.22.3.2 giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.23 LAYOUT OF THE WORK

6.23.1 CONTRACTOR shall be solely responsible for layout of all Work.

ARTICLE 7 - CONTROL OF THE WORK

7.1 AUTHORITY OF THE ENGINEER

7.1.1 The Engineer, acting as Municipalities's representative, shall decide all questions regarding the quality and acceptability of materials furnished, work performed, the rate of progress of the Work, the interpretation of the Contract, and the acceptable fulfillment of the Contract by the Contractor.

7.1.2 If directed by the Municipalities, the Engineer will suspend the Work, wholly or in part, for such periods as may be necessary for the Contractor's failure to correct conditions unsafe for the Project personnel or general public, or carry out provisions of the Contract, or carry out orders of the Engineer. Notwithstanding the foregoing, action on the part of the Municipalities and/or Engineer pursuant to this section shall NOT be deemed to constitute a waiver of the sovereign immunity of the Municipalities, which immunity is hereby expressly reserved by the Municipalities nor shall any such action be claimed to and/or constitute a waiver of the CONTRACTOR's indemnification obligations specified elsewhere herein.

7.1.3 Work may also be wholly or partially suspended for periods necessary due to existing or forecasted unsuitable weather, or for conditions considered unsuitable for the prosecution of the Work such as hazardous materials, directives of the New Hampshire Department of Environmental Services, implementing emergency episode procedures, or any other condition or reason deemed to be in the Municipalities's interest.

7.2 VISITS TO SITE

7.2.1 Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Municipalities, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Municipalities a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Municipalities informed of the progress of the Work and will endeavor to guard Municipalities against defective Work.

7.2.2 Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Article 7, and particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

7.3 AUTHORIZED VARIATIONS IN WORK

7.3.1 Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Municipalities and also on Contractor, who shall perform the Work involved promptly. If Municipalities and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of a Field Order, a Claim may be made therefore as provided herein.

7.4 INTERPRETATION OF CONTRACT DOCUMENTS AND ACCEPTABILITY OF WORK

7.4.1 Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and

other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to Engineer in writing, with a request for a formal decision.

7.4.2 When functioning as interpreter and judge under the contract, Engineer will not show partiality to Municipalities or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by Engineer pursuant to the contract with respect to any such Claim, dispute, or other matter will be a condition precedent to any exercise by Municipalities or Contractor of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

7.5 ENGINEER'S AUTHORITY AND RESPONSIBILITIES

7.5.1 Neither Engineer's authority nor responsibility under any provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

7.5.2 Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

7.5.3 Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

7.5.4 Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation, required to be delivered will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

7.5.5 The limitations upon authority and responsibility set forth in this paragraph shall also apply to Engineer's Consultants, Resident Project Representative, and assistants.

7.5.6 The Contractor shall perform all necessary layout work not specified above in order to construct all elements of the Project as shown on the Plans and specified in the

Contract. This work shall include, but shall not be limited to stakeout necessary for re-establishment of line and grade as earthwork operations progress; stakeout, layout, and elevations as required for structures, forms, pile layouts, and paving. Prior to paving, the Contractor shall perform all work necessary to set the blue top stakes for fine grading.

ARTICLE 8 - TESTS AND INSPECTIONS

8.1 DEFECTS

8.1.1 Prompt notice of all defective Work of which Municipalities or Engineer has actual knowledge will be provided to Contractor in writing. All defective Work may be rejected, corrected, or accepted as provided in this Article 8.

8.2 ACCESS TO WORK

8.2.1 Municipalities, Engineer, Engineer's Consultants, other representatives and personnel of Municipalities, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

8.3 TESTS AND INSPECTIONS

8.3.1 Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

8.3.2 Municipalities shall employ and pay for the services of any additional independent testing laboratory required to perform inspections, tests, or approvals as directed by the Municipalities to confirm the Work is in compliance with the specifications unless results of said testing proves non-compliant Work. Then all costs shall be borne by the Contractor.

8.3.3 Municipalities shall not be responsible for testing/inspection costs associated with the following:

8.3.3.1 for inspections, tests, or approvals covered by paragraphs 8.3.4 and 8.3.5 below;

8.3.3.2 those costs incurred in connection with tests or inspections conducted pursuant to paragraph 8.4.2 shall be paid as provided in said paragraph 8.4.2; and

8.3.3.3 as otherwise specifically provided in the Contract Documents.

8.3.4 If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other

representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

8.3.5 Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Municipalities' and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Municipalities and Engineer.

8.3.6 If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

8.3.7 Uncovering Work as provided in paragraph 8.3.6 shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

8.4 QUALITY ASSURANCE/QUALITY CONTROL

8.4.1 The CONTRACTOR shall be responsible for assuring that all work and materials, complete and in-place, meet or exceed the standards of quality specified or implied in the Contract Documents.

8.4.2 The ENGINEER will employ an independent testing agency to conduct construction quality control testing for earthwork and cast-in-place concrete. Agency name and contact person will be provided to the CONTRACTOR upon Notice to Proceed.

8.4.3 The CONTRACTOR shall adhere to certain general testing and quality control requirements under this Contract. The CONTRACTOR shall:

8.4.3.1 Schedule and coordinate all testing and inspections and notify the testing agency and the ENGINEER sufficiently in advance of operations to allow for the proper assignment of personnel and scheduling of tests.

8.4.3.2 Cooperate with testing agency and the ENGINEER and provide access to the work for testing.

8.4.3.3 Provide representative samples of materials to be tested, in required quantities.

8.4.3.4 Furnish labor and facilities:

- (1) To provide access to work to be tested.
- (2) To obtain and handle samples at the site.

- (3) To facilitate inspections and tests.
- (4) For storage and curing of test samples.

8.4.3.5 Assure that required inspection, sampling and testing has been conducted prior to commencement of any work which would alter or cover the work to be inspected, sampled and/or tested.

8.4.4 All work under this Contract shall be subject to inspection and observation by representatives of the Municipalities and the ENGINEER.

8.4.5 In the event that any quality control testing, inspection or observation results in any indication that any material or portion of the work does not meet Contract requirements, the CONTRACTOR shall, at his sole expense, undertake remedial work and/or repeat testing to the satisfaction of the ENGINEER.

8.4.6 QUALITY CONTROL TESTING FOR EARTHWORK (DELETED)

8.4.7 QUALITY CONTROL TESTING FOR CAST-IN-PLACE CONCRETE (DELETED)

8.5 UNCOVERING WORK

8.5.1 If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

8.5.2 If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, Contractor shall, pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Municipalities shall be entitled to an appropriate decrease in the Contract Price. If such Work is not found to be defective, Contractor shall be allowed an extension of the Contract Times (or Milestones), directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefore as provided herein.

8.6 MUNICIPALITY RIGHT TO STOP WORK

8.6.1 If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Municipalities may order Contractor to stop the Work, or any portion thereof, until the cause for such order has

been eliminated; however, the Municipalities' right to stop the Work shall not give rise to any duty on the part of Municipalities to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

8.7 CORRECTION OR REMOVAL OF DEFECTIVE WORK

8.7.1 Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

8.8 CORRECTION PERIOD

8.8.1 If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Municipalities or permitted by Laws and Regulations as contemplated herein is found to be defective, Contractor shall promptly, without cost to Municipalities and in accordance with Municipalities's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by Municipalities, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Municipalities may have the defective Work corrected or repaired or may have the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

8.8.2 In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

8.8.3 Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph 8.7, the correction period

hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

8.8.4 Contractor's obligations under this paragraph 8.7 are in addition to any other obligation or warranty. The provisions of this paragraph 8.7 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

8.9 ACCEPTANCE OF DEFECTIVE WORK

8.9.1 If, instead of requiring correction or removal and replacement of defective Work, Municipalities (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Municipalities may do so. Contractor shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Municipalities's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Municipalities shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Municipalities.

8.10 MUNICIPALITIES RIGHT TO CORRECT DEFECTIVE WORK

8.10.1 If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with paragraph 8.6, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Municipalities may, after seven days written notice to Contractor, correct and remedy any such deficiency.

8.10.2 In exercising the rights and remedies under this paragraph, Municipalities shall proceed expeditiously. In connection with such corrective and remedial action, Municipalities may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Municipalities has paid Contractor but which are stored elsewhere. Contractor shall allow Municipalities, Municipalities's representatives, agents and employees, Municipalities's other contractors, and Engineer and Engineer's Consultants access to the Site to enable Municipalities to exercise the rights and remedies under this paragraph.

8.10.3 All Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Municipalities in exercising the rights and remedies under this paragraph 8.9 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Municipalities shall be entitled to an appropriate decrease in the Contract Price. Any claims by the Municipalities resulting from the parties' inability to agree will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removals or replacement of Contractor's defective Work.

8.10.4 Contractor shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by Municipalities of Municipalities's rights and remedies under this paragraph 8.9.

ARTICLE 9 - PAYMENTS TO CONTRACTOR AND COMPLETION

9.1 MEASUREMENT AND PAYMENT

9.1.1 Measurement of Quantities. Work completed under the Contract will be measured by the Engineer according to the United States customary measure.

A station, when used as a definition or term of measurement, will be 100 linear feet measured horizontally.

The method of measurement and computations to be used in determination of quantities of material furnished and work performed will be those methods generally recognized as conforming to good engineering practice.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual objects having an area of 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing.

Structures will be measured according to neat lines shown on the plans or as ordered to fit field conditions.

Items which are measured by the linear foot, such as pipe culverts, guardrail, curb, underdrains, etc., will be measured parallel to the base or foundation upon which such structures are placed.

In computing volumes of excavation, embankment, and borrow, the average end area method will be used. Where it is impracticable to measure material by the cross-section method due to irregular, isolated deposits, acceptable methods involving three-dimensional measurement may be used. When measurement of materials in vehicles is permitted, the quantity will be determined as 80 percent of the loose volume.

In computing volumes of concrete and masonry, the prismatic method will be used.

The space occupied by pipe will not be included in the volume of headwalls. In the case of pipe having a wall thickness of 2 inches or more, the area of the pipe will be based on the manufacturer's nominal dimensions, outside to outside, or the shell of the pipe. In the case of pipe having a wall thickness of less than 2 inches, the area of the pipe will be based on the nominal inside diameter of the pipe.

The thickness of plates and galvanized sheets used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fractions of inches.

The term "ton" will mean the short ton consisting of 2,000 pounds. Except as specified below, materials which are measured or proportioned by weight shall be weighed on scales which the Contractor has had sealed by the New Hampshire Department of Agriculture or by a company approved by that Department. All weighing shall be performed in a manner prescribed under the Rules and Regulations of the Bureau of Weights and Measures of the New Hampshire Department of Agriculture. Weighing of materials on scales located outside New Hampshire will be permitted for materials produced or stored outside the State, when requested by the Contractor. Out-of-state weighing, in order to be approved, must be performed on scales sealed by the appropriate governmental authority.

If material is shipped by rail, the car weight may be accepted, provided that payment is made only for the actual weight of material. Car weights will not be acceptable for material to be passed through mixing plants.

Trucks used to haul material being paid for by weight shall be weighed empty daily at times directed by the Engineer. Each truck shall bear a plainly legible identification mark.

When material is weighed, the individual weight slips, which shall be furnished by the Contractor, for trucks, trailers, or distributors, shall show the following information: the date, the project name and number; slip number; the material or commodity; the dealer or vendor; the Contractor or Subcontractor; the location of the scales; the time of loading; the vehicle registration number or other approved legible identification mark; the tare and net weights, with gross weights when applicable; and the weigher's name, signature, or signed initials.

The right is reserved to weigh any truck, trailer, or distributor, at locations designated, before and after making deliveries to the Project.

When requested by the Contractor and approved or ordered by the Engineer in writing, material specified to be measured by the cubic yard may be weighed and converted to cubic yards. Factors for conversion from weight measurement to volume measurement will be determined by the Engineer and agreed to by the Contractor before this method of measurement of pay quantities is used.

Bituminous materials will be measured by the gallon.

Timber will be measured by the thousand feet board measure (MBM) actually incorporated in the structure. Measurement will be based on nominal widths, thicknesses, and the extreme length of each piece.

The term “lump sum,” when used as an item of payment, will mean complete payment for the Work described in the Contract.

When a complete structure of structural unit (in effect, “lump sum” work) is specified as the unit of measurement, the unit includes all necessary fittings and accessories.

Except as may be otherwise provided, partial payments for lump sum items will be made approximately in proportion to the amount of the work completed on those items.

Rental of equipment will be measured in hours of actual working time and necessary travel time of the equipment within the limits of the Project. If special equipment has been ordered by the Engineer in connection with force account work, travel time and transportation to the project will be measured. If equipment is ordered held on the property on a standby basis by the Engineer, payments will be made as provided herein.

When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe, conduit, etc. and these items are identified by gauge, unit weight, section dimensions, etc., the identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

Material wasted without authority will not be included in the final pay quantity.

When the estimated quantities for a specific portion of the Work are designated as final pay quantities in the Contract, they shall be the final pay quantities for which payment will be made in accordance with 9.14.

9.1.2 Scope of Payment. The Contractor shall receive and accept compensation provided for in the Contract as full payment for furnishing all materials; for performing work under the Contract in a complete and acceptable manner; and for all risk, loss, damage, or expense arising out of the nature or prosecution of the work, subject to the provisions contained herein.

9.1.3 Compensation for Altered Quantities. When the accepted quantities of work vary from the quantities in the Contract, the Contractor shall accept payment at the original Contract unit prices for the accepted quantities of work done.

9.1.4 Differing Site Conditions, Changes, Extra Work, and Force Account Work. Differing Site Conditions, changes and Extra Work performed under Article 5.2 will be paid for using the following methods as appropriate:

- Contract unit prices.
- Unit prices agreed upon in the order authorizing the work.
- An agreed upon lump sum amount.
- If directed by the Department, on a force account basis to be compensated in the following manner:

9.1.4.1 Labor. For all labor, including equipment operators, and foremen in direct charge of the specific operation, the Contractor shall receive the rate of wage agreed to in writing for each and every hour that the labor and foreman are actually engaged in the work. In case the Contractor is required to pay overtime pay or holiday pay to labor engaged in the Work, such rate will be the rate reimbursed. When the Contractor is ordered to return to the project solely to perform Extra Work, labor will be considered as being actually engaged in the Work during the hours while traveling.

No part of the salary or expenses of anyone connected with the Contractor's forces above the grade of foreman and having general supervision of the Work will be included in the labor item as specified above, except under any of the following conditions: (1) The work ordered is of an emergency nature or is ordered too late to be done before all work shown on the Plans or provided for in the Proposal has been substantially accomplished, (2) the Contractor's organization is entirely occupied with Extra Work, or (3) the nature of the work is such that the services of superintendents and timekeepers may be included in the classification of labor. In order to determine the allowable rate of pay of eligible superintendents, foremen, and timekeepers, a notarized statement shall be furnished to the Engineer. In case no documentary evidence of the actual rate of pay is furnished for such superintendents, foremen and timekeepers, no reimbursement will be allowed. Transportation for a superintendent will be paid for as equipment in the manner specified in (3) below.

The Contractor will also receive an additional amount (i.e. a labor burden rate) equal to 50 percent of the actual hourly rate paid to, or in behalf of workers, for costs of health and welfare benefits, taxes, insurances, retirement (including social security taxes), union benefits, and unemployment insurance premiums.

The unemployment insurance rate shall be the lesser of the Contractor's current unemployment insurance rate or the Unemployment Insurance Rate for New Employer established by the New Hampshire Department of Employment Security. The worker's compensation rate shall be the National Council on Compensation Insurance published rates approved by the New Hampshire Department of Insurance. All rates paid will be the Contractor's policy rate in effect at the time work is performed. For work outside the State of New Hampshire, the rates paid shall be the rates established by the

appropriate agency of the State in which the work is performed. The Contractor shall furnish evidence of the rate or rates paid for such insurance, and taxes.

A Contractor can request a different labor burden rate be used if an independently audited breakdown of the actual aforementioned costs, prepared by a Certified Public Accountant, is provided. The audit of the burden rate shall be prepared on current financial data and in conformity with the accounting practices prescribed by the Federal Acquisition Regulations 48 CFR, Part 31.

An amount equal to ten percent of the sum of the above labor-related items will also be paid the Contractor.

Subsistence and travel expenses paid by the Contractor will be reimbursed only when the Engineer orders Extra Work and in order to perform such work, it is necessary to move workers to the project particularly for that operation. Such subsistence and travel expenses allowed shall be carried on the daily report form under the classification of "Material," without, however, being subject to the added percentage for materials. If work other than such Extra Work is performed by the individuals during or in connection with that operation, no subsistence or travel expenses will be allowed.

9.1.4.2 Materials and Specialized Work. When the Engineer directs special work not included in the Contract, requiring skills, tools, and equipment unlike those used by the Contractor, payment may be made for such work performed by a specialist. For specialist services, and materials accepted by the Engineer whether furnished by a specialist or by the Contractor, the Contractor will receive the actual cost, including transportation charges paid (exclusive of equipment rentals and hereinafter set forth), to which cost 15 percent will be added. Invoices not exceeding a value of two thousand dollars per work event for specialist services on the basis of the current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide such complete itemization. If specialized work is carried out by a subcontractor, provisions of paragraph 5 herein shall apply.

The cost of materials will be the cost to the purchaser, whether Contractor, Subcontractor, or other, from the supplier thereof, except as the following are applicable:

- a. If materials are procured by the purchaser by any method which not a direct purchase is from and a direct billing by the actual supplier to such purchaser, the cost of such materials will be deemed to be the price paid to

the actual supplier as determined by the Engineer. No markup except for actual costs incurred in the handling of such materials will be permitted.

- b. If the materials are obtained from a supply or source owned wholly or in part by the purchaser, payment will not exceed the price paid by the purchaser for similar materials furnished from said source on contract items or the current wholesale price for such materials delivered to the job site, whichever price is lower.
- c. If, in the opinion of the Engineer, the cost of such materials is excessive, then the cost of such material will be deemed to be the lowest current wholesale price at which such materials are available in the quantities concerned delivered to the job site.
- d. If the Contractor does not furnish satisfactory evidence of the cost of such materials from the actual supplier, the cost will then be determined in accordance with paragraph (c).

9.1.4.3 Equipment and Plant. For any Contractor-owned machinery or special equipment (other than small tools), the use of which is approved by the Engineer, the hourly rate will not exceed that determined from the latest edition of the “Rental Rate Blue Book for Construction Equipment” published by Dataquest, Inc. used in the following manner.

- a. The hourly equipment rental rate (R) will be determined by formula as follows:

$$R = (A \times B \times C) + D$$

Where

- A = Monthly rate divided by 176. The listed weekly, hourly, and daily rates will not be used.
 - B = Average regional adjustment factor for New Hampshire.
 - C = Factor from Rate Adjustment Table for the year of equipment manufacture.
 - D = Estimated operating costs per hour.
- b. The number of hours to be paid for will be the number of hours that the equipment or plant is actually used on a specific Force Account activity and in addition, shall include the time required to move the equipment to the location of such force account activity and return it to the original location or to another location requiring no more time than that required to return it to its original location, except that moving time will not be paid for if the equipment is used during the move on work other than the specific Force Account activity.
 - c. The current revision of the “Blue Book” applicable to the specific Force Account work is as of the beginning of the calendar year in which Extra Work is being performed. Revised sections published during the year will

not be incorporated in the “Blue Book” until the beginning of the next calendar year.

- d. The average regional adjustment factor applicable for this Contract will be specified in the Supplemental Specification for this Subsection. The average regional adjustment factor will be reviewed and revised annually subsequent to revisions of “Blue Book” sections. Equipment life adjustments will be made using the rate adjustment tables.
- e. Overtime shall be charged at the same rate indicated in subparagraph (a) above.
- f. The estimated operating costs per hour will be used for each hour that the equipment or plant is in operation on the Force Account work. Such costs do not apply to idle time regardless of the idleness.
- g. The maximum rental period to be paid for per day shall not exceed eight hours unless the equipment operates for eight or more hours.
- h. The rates established above shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs, overhauls and maintenance of any kind, depreciation, storage, overhead, profits, insurance and all incidentals.

The Contractor shall provide the Engineer with the following: the manufacturer’s name, equipment type, year of manufacture, model number, type of fuel used, horsepower rating, attachments required, together with their size or capacity, and any further information necessary to ascertain the proper rate. Unless otherwise specified, manufacturer’s ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer. The Contractor shall have available for the Engineer’s use a revised copy of the “Blue Book” as referenced in above.

Equipment used by the Contractor shall be in good working condition and shall be of suitable size and suitable capacity required for the work to be performed. The rate for the basic equipment with the appropriate attachments shall include only the rate for the combined equipment necessary to perform the extra work. In case the Contractor elects to use equipment of a higher rental value than that suitable for the work, payment will be made at the rate applicable to the suitable equipment. The equipment actually used and the suitable equipment to be paid for will be recorded as a part of the record for Extra Work. The Engineer will determine the suitability of the equipment. If there is a differential in the rate of pay of the operator of oversize or higher rate equipment, the rate paid for the operator will likewise be that for the suitable equipment.

Payable time periods will not include: (1) time elapsed while equipment is inoperative due to breakdowns, (2) time spent repairing equipment, or (3) time elapsed 24 hours after the Engineer has advised the Contractor that the equipment is no longer needed.

If a piece of equipment is needed that is not listed in the above stated rental rate guide, a rate will be established by the Engineer in writing before the equipment is used. The Contractor may furnish any cost data which might assist the Engineer in the establishment of such rate.

If the Contractor does not own a specific type of equipment and must obtain it by rental, the Contractor shall inform the Contract Administrator of the need to rent the equipment and of the rental rate for that equipment before using it on the work. The Contractor will be paid the actual rental for the equipment for the time that the equipment is actually used to accomplish the work provided that the rate is reasonable, plus the cost of moving the equipment onto and away from the job. The Contractor shall provide a copy of the paid receipt or canceled check for the rental expense incurred.

Transportation charges for each piece of equipment, whether owned or rented, moved to and from the site of the work will be paid provided: (1) the equipment is obtained from the nearest approved source, (2) the return charges do not exceed the delivery charges, (3) haul rates do not exceed the established rates of licensed haulers, (4) charges are restricted to those units or equipment not already available and not on or near the Project, and (5) equipment is not used elsewhere on the project.

9.1.4.4 Miscellaneous. No additional allowance will be made for general superintendence, the use of small tools, or for other costs for which no specific allowance is provided.

9.1.4.5 Subcontracting. For administration costs in connection with approved subcontract work, the Contractor shall receive an amount equal to five percent of the total cost of work computed as set forth above, except that no percentage will be allowed for equipment rented from the Contractor. In the event lower tier subcontracting is required, the administration cost shall not exceed a combined total of 20% of the actual cost of the work as computed above.

9.1.4.6 Bond. The Contractor will receive the actual costs for bond premium as a percentage of the total cost of the Work computed as set forth above for work paid under items not originally in the contract. The Contractor shall furnish evidence of the rate paid for such bond.

9.1.4.7 Compensation. The compensation herein provided shall be accepted by the contractor as payment in full for Force Account work, including

superintendence (except as provided in (1) above), subcontracting, taxes, bond, overhead, profit, and other costs in connection with the Work which are not provided for.

9.1.4.8 Statements. The Contractor's representative and the Engineer each day shall compare records of the cost of work completed on a Force Account basis. These daily records shall be set forth on the forms provided by the Engineer and shall thereafter be considered to be the basis for payment of the work performed, but shall not preclude subsequent adjustment based on a late audit by the Department.

No payments will be made for work performed on a Force Account basis until the Contractor has furnished the Engineer with a statement of the cost of the Force Account work showing the following:

- a. Name of subcontractor, if appropriate.
- b. Name, classification, date, daily hours, total hours, rate, and extension for each laborer, operator, and foreman.
- c. Quantities of materials, prices, and extensions.
- d. Charges for transportation of materials.
- e. Specialized work charges.
- f. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of equipment or plant.

The Contractor shall certify that the labor, materials, and equipment listed were actually used on the Force Account Extra Work described, that the labor and equipment were used for the hours indicated and that the rates for labor do not exceed those for comparable labor currently employed on the project.

Statements shall be accompanied and supported by certified copies of the appropriate payrolls, and invoices for all materials and specialized work and for transportation charges. If materials used on the Force Account work are not specifically purchased for the work but are taken from the Contractor's stock, the Engineer shall be furnished an affidavit certifying that the materials were taken from stock, that the quantity claimed was actually used, and that the price and transportation claimed represents the Contractor's actual cost.

During the life of the contractor and for a period of not less than three years after the date of Acceptance thereof, the Contractor's cost records pertaining to work paid for on an Extra Work basis shall be open to inspection or audit by representatives of the Department, and the Contractor shall retain such records for that period. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor shall make every reasonable effort to ensure that the cost records of such other forces will

be open to inspection and audit by representatives of the Municipalities on the same terms and conditions as the cost records of the Contractor.

9.1.4.9 Final Pay Quantity. When an item of work is designated as a final pay quantity in the Method of Measurement, or Basis of Payment, or Bid Schedule as (F), the estimated bid quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion or the quantity of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion or the quantity of the item are revised, and the revision results in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions or the quantity. If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

The estimated quantity for each item of work designated as a final pay quantity in the Method of Measurement or Basis of Payment or Bid Schedule shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No adjustment will be made in the event that the quantity based on computations does not equal the estimated quantity except under the following conditions:

- a. A quantity adjustment (increase or decrease) to the estimated bid quantity will be made if either the actual quantity is more than 125 percent or less than 75 percent of the estimated bid quantity for roadway items, or the value of the actual quantity is more than or less than \$10,000.00 of the estimated bid quantity value.
- b. A quantity adjustment (increase or decrease) to the estimated bid quantity will also be made if either the actual quantity per bridge structure is more than 125 percent or less than 75 percent of the estimated bid quantity for that bridge item or the value of the actual quantity is more than or less than \$10,000.00 of the estimated bid quantity value.

In case of discrepancy between the quantity shown in the Bid Schedule for a final pay item and the quantity or summation of quantities for the same item shown on the plans or in the proposal, payment will be based on the quantity shown in the Bid Schedule.

9.2 SCHEDULE OF VALUES AND PARTIAL PAYMENT APPLICATIONS

9.2.1 The schedule of values established as provided herein shall serve as the basis for progress payments and will be incorporated into a form of Application for Payment

acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

9.2.2 At least 5 days before the date established for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitable stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Municipalities has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Municipalities' interest therein, all of which must be satisfactory to Municipalities.

9.2.3 Unless specifically waived by a Special Provision or Supplemental Condition, the Municipalities shall retain ten (10) percent of the amount of progress payments until completion and acceptance of all Work under the Contract; except, that if upon completion of 50 percent of the Work, the Contracting Officer, after consulting with the Engineer, determines that the Contractor's performance and progress are satisfactory, the Municipalities may make the remaining payments in full for the Work subsequently completed. If the Contracting Officer subsequently determines that the Contractor's performance and progress are unsatisfactory, the Municipalities shall reinstate the ten (10) percent retainage until such time as the Contracting Officer determines that performance and progress are satisfactory.

9.2.4 The Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration when computing progress payments. Material delivered to the Contractor at locations other than the site may also be taken into consideration if the Contractor furnishes satisfactory evidence that (1) it has acquired title to such material; (2) the material is properly stored in a bonded warehouse, storage yard, or similar suitable place as may be approved by the Contracting Officer; (3) the material is insured to cover its full value; and (4) the material will be used to perform this Contract. Before any progress payment which includes delivered material is made, the Contractor shall furnish such documentation as the Contracting Officer may require to assure the protection of the Municipalities' interest in such materials. The Contractor shall remain responsible for such stored material notwithstanding the transfer of title to the Municipalities.

9.2.5 All material and work covered by progress payments made shall, at the time of payment become the sole property of the Municipalities, but this shall not be construed as (1) relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or (2) waiving the right of the Municipalities to require the fulfillment of all of the terms of the contract. In the event the work of the Contractor has been damaged by other contractors or persons

other than employees of the Municipalities in the course of their employment, the Contractor shall restore such damaged work without cost to the Municipalities and to seek redress for its damage only from those who directly caused it.

9.2.6 Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

9.2.7 Within 10 days after receipt of each Application for Payment, the Engineer shall either indicate in writing a recommendation of payment and present the Application to Municipalities or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

9.2.8 Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Municipalities, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief that:

9.2.8.1 The quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work, and to any other qualifications stated in the recommendation); and

9.2.8.2 The conditions precedent to Contractor being entitled to such payment appears to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

9.2.8.3 By recommending any such payment Engineer will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Municipalities or entitle Municipalities to withhold payment to Contractor.

9.2.9 Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer to supervise, direct, or control the Work or for the

means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work. Additionally, said review or recommendation will not impose responsibility on Engineer to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to Municipalities free and clear of any Liens.

9.2.10 Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Municipalities referred to herein Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Municipalities from loss because:

9.2.10.1 the Work is defective, or completed Work has been damaged, requiring correction or replacement;

9.2.10.2 the Contract Price has been reduced by Written Amendment or Change Orders;

9.2.10.3 Municipalities has been required to correct defective Work or complete Work in accordance with the Specifications; or

9.2.10.4 Engineer has actual knowledge of the occurrence of any of the events warranting Contractor's termination for cause.

9.3 PAYMENT TO THE CONTRACTOR

9.3.1 Payment to the Contractor shall become due in accordance with the Municipalities' approval and payment schedule, but not later than thirty (30) days after presentation of the Application for Payment to Municipalities with Engineer's recommendation of the amount for payment (subject to the provisions contained herein) and will be paid by Municipalities to Contractor.

9.4 REDUCTION IN PAYMENTS

9.4.1 Reduction in payments recommended by the Engineer may be made by the Municipalities when:

9.4.1.1 Claims have been made against Municipalities on account of Contractor's performance or furnishing of the Work;

9.4.1.2 Liens have been filed in connection with the Work, except where Contractor has delivered a specific Bond satisfactory to Municipalities to secure the satisfaction and discharge of such Liens;

9.4.1.3 there are other items entitling Municipalities to a set-off against the amount recommended; or

9.4.1.4 Municipalities have actual knowledge of the occurrence of any of the events enumerated in Article 9.1.

9.4.2 Liquidated Damages.

9.4.2.1 If the Contractor fails to complete the Work within the time specified in the Contract, or any extension, the Contractor shall pay to the Municipalities liquidated damages, as indicated in the contract for each day of delay. If different completion dates are specified in the Contract for separate parts or stages of the Work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this Contract, liquidated damages shall not be due the Municipalities. The Contractor remains liable for damages caused other than by delay.

9.4.2.2 If the Municipalities terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the Municipalities work together with any increased costs occasioned the Municipalities in completing the Work.

9.4.2.3 If the Municipalities do not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the Work is completed or accepted.

9.5 PAYMENT FOR ALTERATIONS TO THE CONTRACT

9.5.1 The Contractor shall receive and accept compensation provided for in the Contract as full payment for furnishing all materials; for performing work under the Contract in a complete and acceptable manner; and for all risk, loss, damage, or expense arising out of the nature or prosecution of the work, subject to the provisions contained herein.

9.5.2 When final approved quantities of work vary from the Contract quantities, the Contractor shall accept payment at the original Contract unit prices for the accepted quantities of work done, unless specified otherwise in this Contract.. No additional allowance will be considered unless approved by the Engineer.

9.5.3 Differing Site Conditions, changes, and Extra Work approved in accordance with the terms herein will be paid as stipulated in 9.1.4 herein.

9.6 UNJUSTIFIED WITHHOLDING OF PAYMENT

9.6.1 If it is subsequently determined that Municipalities' refusal of payment was not justified, the amount previously withheld shall become due with the subsequent request for payment

9.6.2 The Municipalities and/or Engineer shall not be liable to the Contractor for damages resulting from the incorrect withholding of a payment

9.7 WRITTEN NOTICE TO CONTRACTOR

9.7.1 If Municipalities refuses to make payment of the full amount recommended by Engineer, Municipalities must give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Municipalities shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Municipalities and Contractor, when Contractor corrects to Municipalities' satisfaction the reasons for such action.

9.8 CONTRACTOR REPRESENTATIONS

9.8.1 Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Municipalities no later than the time of payment free and clear of all Liens.

9.9 SUBSTANTIAL COMPLETION

9.9.1 When substantially complete the Contractor shall notify Municipalities and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Promptly thereafter, Municipalities, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefore. If Engineer considers the Work substantially complete, Engineer will prepare and deliver to Municipalities a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Municipalities shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Municipalities notify Contractor in writing, stating the reasons therefore. If, after consideration of Municipalities' objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Municipalities and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Municipalities. At the time of delivery of the tentative certificate of Substantial Completion Engineer will deliver to Municipalities and Contractor a written recommendation as to division of responsibilities pending final payment between Municipalities and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Municipalities and Contractor agree otherwise in writing

and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Municipalities and Contractor until final payment.

9.10 FINAL INSPECTION

9.10.1 A final inspection shall be performed by the Engineer upon written notice from Contractor that the entire Work or an agreed portion thereof is complete. The Municipalities and Contractor shall attend the Engineer's inspection and Engineer shall promptly notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

9.11 FINAL PAYMENT

9.11.1 Final payment shall be made to the Contractor after, in the opinion of Engineer, the Contractor has satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents, and other documents.

9.12 PROGRESS PAYMENTS

9.12.1 Contractor may make application for final payment in accordance with the procedure for progress payments:

9.12.2 The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required herein; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to Municipalities) of all Lien rights arising out of or Liens filed in connection with the Work.

9.12.3 In lieu of the releases or waivers of Liens specified herein and as approved by Municipalities, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Municipalities or Municipalities' property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a Bond or other collateral satisfactory to Municipalities to indemnify Municipalities against any Lien.

9.13 ACCEPTANCE OF WORK BY ENGINEER

9.13.1 If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Municipalities for payment. At the same time Engineer will also give written notice to Municipalities and Contractor that the Work is acceptable subject to the provisions contained herein. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

9.14 ADJUSTMENTS TO FINAL PAYMENT

9.14.1 When an item of work is designated as a final pay quantity in the Method of Measurement, Basis of Payment, and Bid Schedule (F), the estimated bid quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion or the quantity of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion or the quantity of the item are revised, and the revision results in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions or the quantity. If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

The estimated quantity for each item of work designated as a final pay quantity in the Method of Measurement and Basis of Payment shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No adjustment will be made in the event that the quantity based on computations does not equal the estimated quantity.

The Contractor may review the computations of final pay quantity items on record at the Municipalities. The computations requested will be available within one week after a request is received by the contact person stated in the Invitation for Bids. In case of discrepancy between the quantity shown in the Bid Schedule for a final pay item and the quantity or summation of quantities for the same item shown on the plans, payment will be based on the quantity shown in the Bid Schedule.

ARTICLE 10 - MISCELLANEOUS

10.1 WRITTEN NOTICE

10.1.1 Whenever any provision of the Contract requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

10.1.2 When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

10.2 CUMULATIVE REMEDIES

10.2.1 The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

10.3 SURVIVAL OBLIGATIONS

10.3.1 All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Agreement.

10.4 CONTROLLING LAW

10.4.1 This Contract is to be governed by the laws of the state in which the Project is located.

10.5 PROJECT VISITATION BY THIRD PARTY

10.5.1 Non-emergency visits by third party requires 24-hour notice to Contractor and Engineer. The Contractor must provide applicable contact name and phone number of desired point of contact. If the primary contact is unavailable, an appropriate voice message must be provided describing an alternate contact person and phone number.

SECTION 13 34 19.29

PRECAST CONCRETE UTILITY BUILDING

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section of the specification covers all materials, labor, tools and equipment, and operations necessary to furnish and install a precast concrete utility building including doors and louvers as shown on the contract drawings. The building shall be delivered to the jobsite and installed by the Contractor. The building manufacturer shall provide all lifting cables and hardware needed to off-load and set the building.
- B. Contractor to provide sub-grade materials and depths as required by the manufacturer.

1.02 RELATED WORK:

- A. Division 26, Electrical
- B. Division 31, Earthwork

1.03 QUALITY ASSURANCE:

- A. The precast concrete building manufacturer shall be a firm experienced in this type of work and having a minimum of five (5) years experience. The structure shall be manufactured in plants having been certified under either the NPCA or PCI Plant Certification Program. The manufacturer shall submit evidence showing that he has successfully completed work of this nature prior to being approved to supply concrete to the project. The building shall be the monolithic or panel type precast concrete utility building as manufactured by United Concrete, Yalesville, CT; Concrete Systems, Inc., Londonderry, NH; Rotondo & Sons, Inc., Rehoboth, MA, or an approved equal.

1.04 REFERENCES:

The following standards form a part of these specifications:

American Concrete Institute (ACI)

ACI 318 Building Code Requirements for Reinforced Concrete

ACI 512 Recommended Practice for Manufactured Reinforced Concrete Floor and Roof Units.

American Society of Civil Engineers (ASCE)

ASCE/SEI 7-10 Standard Building Code Requirements for Minimum Design Loads in Buildings and Other Structures

American Society for Testing and Materials (ASTM)

ASTM A123 Zinc (Hot Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates and Strip.

ASTM A185 Welded Steel Wire Fabric for Concrete Reinforcement.

ASTM A615 Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

ASTM C33 Concrete Aggregates

ASTM C150 Portland Cement

1.05 DESIGN CRITERIA:

- A. The building shall be designed to meet the New Hampshire State Building Code (IBC 2015) or the *minimum* loadings as required in ASCE 7-10. Refer to the structural drawings, Sheet S001, for design loading requirements.
- B. The building floor and roof shall be designed for minimum outside dimensions of 14' X 23' without the use of interior supports of any type. The building interior finished height shall be 8 feet minimum. The roof, floor and wall thickness shall be a minimum of 4-inches thick.
- C. The roof shall have a minimum slope of 1-inch over 8 feet, sloped in a direction as required by the Engineer. The roof shall overhang all walls a minimum of 1-1/2-inches.
- D. The exterior walls shall be finished with an exposed aggregate finish with a cantilever strip type extension at the base and roofline.

1.06 WARRANTY

- A. The Manufacturer shall warranty the building components for one year from the date of installation.
- B. The precast concrete structure shall endure and not deteriorate for a period of twenty (20) years.

1.07 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six (6) copies of shop and erection drawings shall be submitted for the Engineer's review. The drawings shall show all dimensions of precast sections; location openings; the locations, type, size and strength of inserts, embedded angles, steel reinforcement; and all other information necessary to insure proper handling, fabrication, and erection of the building.
- B. Six (6) copies of the building design calculations and drawings stamped by a registered professional engineer in the State the building is to be installed shall be submitted to the Engineer for record only.

PART 2 - MATERIALS

2.01 CONCRETE:

- A. Cement shall be Portland cement Type III. Concrete shall conform to ASTM C150. Admixtures, other than air-entraining and water-reducing admixtures, shall not be permitted unless approved by the Engineer.
- B. Concrete shall have a minimum strength of 5000 psi at 28 days.
- C. Aggregate shall conform to ASTM C33.

2.02 STEEL REINFORCING:

- A. Reinforcing steel shall be new billet steel meeting the requirements of ASTM A615 Grade 60. Welded wire fabric shall conform to ASTM A185.
- B. Reinforcing steel shall be accurately formed and shall be free from loose rust, scale and contaminants which reduce bond.
- C. Reinforcing steel shall be accurately positioned on supports, spacers, hangers, and or other reinforcement and shall be secured in place with wire ties or suitable clips.

2.03 INSERTS:

- A. All cast-in-place inserts shall be galvanized and of a type approved by the Engineer. Galvanization shall conform to ASTM A123.

2.04 DOOR AND HARDWARE:

- A. Doors shall be double flush 18 gauge galvanized steel construction insulated core 6'-0" x 6'-9" x 1-3/4" thick for double doors and 3'-0" x 6'-9" x 1-3/4" thick for single doors. Frame shall be constructed of galvanized steel with welded joints.
- B. A key operated security lock that matches the Owner's standard lockset shall be installed with corrosion resistant handles.
- C. The door shall be provided with aluminum threshold, door sweep, lock guard, 6" drip cap, non-removable pin hinges, weatherstrip, weatherstop, retaining hooks to hold door open, and a retaining chain and spring to keep the door restrained.

2.05 AIR EXHAUST FANS:

- A. Exhaust fans shall be manufactured by Greenheck Fan Co., ILG Co., Penn Ventilator Co., Jenn-Air Fan Co., or an approved equal.
- B. Manufacturers of other products comparable in quality and type to those specified will be acceptable if said products are offered by the Contractor with satisfactory data on past performance and other information required, and if approved by the Engineer.
- C. Wall fans shall be propeller type with steel frame and steel blade. Fans shall have direct drive. The fan capacity shall be minimum 375 cfm at 0.2-inch static pressure (inches of water). Motors shall have Class B insulation and shall be located out of the air stream. The motors shall be designed for 120 volts, single phase, 60 Hz operation. Motors shall be energy-efficient type. Motors shall be of the open drip-proof type. A motor disconnect switch shall be located next to the exhaust fan housing. The fan and motor bearings shall be permanently lubricated, sealed ball or roller bearings with provisions for thrust as required. Vibration isolating mountings shall be installed on the fan drive assembly.

2.06 LOUVERS:

- A. The louvers shall be extruded aluminum louvers with frames and blades fabricated from 6063-T5 aluminum alloy of the sizes indicated on the drawings. Louver blades shall be the storm proof type. The head, sill, and jamb members shall be fabricated from identical structural members and shall be provided with an integral caulking slot and retaining head. Extruded sill extensions shall be furnished and installed with louvers. All fastenings shall be stainless steel or aluminum.
- B. The frame and blades of the fixed louver shall be a minimum thickness of 0.081-inches and shall be provided with reinforcing bosses.

- C. All louvers shall have heavy duty bird screen attached to masonry work. Screening shall be intercrimp aluminum wire secured in 10 B&S gauge extruded frames. Mesh shall be 0.1-inch 0.092 intercrimp wire. Frames shall be rewirable. Heavy duty bird screens shall be manufactured by Construction Specialties, Inc., Cranford, New Jersey, or an approved equal.

2.07 ELECTRIC DAMPERS

- A. Dampers, where indicated, shall be multi-blade louver or butterfly type. Dampers shall be constructed of aluminum and be one gage heavier material than the ducts in which they are installed. Motor-operated louver dampers shall have the blades hung on rods supported in oil impregnated bearings. The edges of the blades shall overlap when closed and make a tight seal.
- B. The louvers shall be constructed of aluminum sheets not less than 0.025-inches thick. The edges of the blades shall be provided with felt strips to prevent rattling. The damper blades shall be supported in metal frames.
- C. Motor operated dampers shall open away from the source of the air stream to reduce the static pressure that the dampers must overcome during opening.
- D. An electric type damper motor on the outside air and exhaust air damper will open the dampers when the emergency generator is running and close the dampers when the generator is shut down. Required damper motors shall be 120/1/60 voltage of the building. Dampers shall be interlocked so that on a building power failure the dampers will go open, using a spring return type damper motor. Dampers shall open when the generator starts. Exhaust fans shall start and stop with damper operation.

2.08 UNIT HEATER

- A. The building shall be provided with a natural gas heater. The heater shall have a minimum rating of, 20,000 BTU/HR output when operating on a 115 volt, single phase A.C. power source. The heating element shall be of the sealed tubular type with large parallel steel fins for quick heat transfer. The heater shall be complete with a thermal overload cut off and a wall mounted thermostat calibrated to provide a minimum range of 45 degrees Fahrenheit to 80 degrees Fahrenheit.
- B. The heater control shall be a three way switch for off-on-constant control. The constant mode shall control the heater to maintain a user adjustable temperature or temperature range.

2.09 ELECTRICAL

- A. The building manufacturer shall equip the building as shown on sheets M001 and M002 and as described in this specification to include furnishing and installation of wiring and lighting, raceways and boxes, panel boards, dry-type transformer, air exhaust fans, louvers, electric dampers, and unit heater.
- B. Three phase power shall be supplied from the utility pole located on site to the building via underground service to the electrical meter located on the precast building.

2.10 FINISHES

- A. The exterior surface of the building body shall be of an architectural concrete finish and receive one (1) coat of Thoroseal concrete sealer and one (1) coat of Thorocoat acrylic coating. The exterior building trim shall be treated in the same manner. Colors to be selected by the Owner during the shop drawing review process.
- B. The interior walls and ceiling of the building shall receive prepainted FRP board, 3/8" thick, Alpine White color (#400). Insulation with R-14 value, 2" thick, shall be supplied beneath the FRP board.
- C. The floor shall be coated with Sherwin-Williams Amorseal Rexthane I floor coating with Sharkgrip additive for nonslip profile, Tnemec Series 201/208 Epoxy Flooring System with sand broadcast, or approved equal.

PART 3 - EXECUTION

3.01 FABRICATION AND ASSEMBLY:

- A. The manufacturer shall check and verify all dimensions, elevations, and locations of openings, anchor bolts, inserts and other cast-in items. Any discrepancy or lack of information shall be reported to the Engineer before fabrication.
- B. The Contractor shall be responsible for any failure to precast sections to the correct dimensions and for any omissions or inaccuracies in the manufacture. If, in the opinion of the Engineer, proper corrections cannot be made, the section shall be rejected and shall be replaced with a new section at the Contractor's expense.
- C. Monolithic buildings shall be entirely assembled by the manufacturer at the plant, sealed, waterproofed, and tested for water tightness.
- D. Sectioned buildings shall be post-tensioned together at floor and roof locations per manufacturer's requirements.

- E. The roof shall have a minimum slope of 1-inch, sloped in a direction as directed by the engineer. The roof shall overhang all walls a minimum of 1.5-inches.

3.02 INSTALLATION:

- A. Erection of the building shall be done by experienced workmen, in accordance with the previously mentioned standards.
- B. The Contractor shall be responsible for supplying a crane to place the structure.
- C. All joints shall be caulked with Tremco Dymonic compound or an approved equal, to maintain a permanent seal under severe weather conditions.
- D. All sleeve wall penetrations shall have neoprene gaskets to insure a watertight seal.
- E. No field holes or cuts shall be made in any section without the prior approval of the Engineer. All holes shall be cut in accordance with manufacturer recommendations.
- F. The building exterior shall be painted by the manufacturer. Interior walls and ceiling shall be prepared by the manufacturer for painting by removal of all foreign matter, dirt, grease and other surface contaminants.
- G. Interior floor finish painting shall be by the Contractor in the field. Paint color to be selected by the Engineer.

3.03. MANUFACTURER'S SERVICES:

The services of a factory-trained, qualified manufacturer's service representative shall be provided for not less than one 8-hour day to assist in installation of the precast concrete utility building, to assure that the installation is in accordance with the manufacturer's recommendations.

END OF SECTION

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SECTION 43 21 13.13

VERTICAL TURBINE PUMPS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers furnishing and installation of vertical turbine-type pumps and appurtenances complete, including motors.

1.02 PUMP SCHEDULE:

- A. The following vertical turbine pumps shall be furnished and installed under this section:

Pump	Capacity (gpm)	Total Dynamic Head (feet)	Maximum Motor Horsepower	Minimum Field Efficiency	Distance (feet)*
Domestic Pumps No. 1&2	600 550 450	220 240 280	50 50 50	75 78 78	7 7 7
Pump No. 3	1,100 1,000 800	200 245 305	100 100 100	76 79 79	7.5 7.5 7.5

* Distance - Approximate distance between the bottom of the pump base plates and the bottom of the suction bells. The Contractor and manufacturer shall field verify.

- B. The NPSH requirement of all vertical turbine pumps shall not exceed 25 feet for the full hydraulic ranges stated above.
- C. The vertical turbine pumps are listed at different service conditions. The conditions outline the system curve that the design has been based upon. Proposed pumps must meet all conditions for consideration.
- D. Adequate tolerances in the listed capacity, head and efficiency values have been included. No deviation below the listed parameters will be permitted.
- E. Pumps with a design point located to the left of the peak efficiency of the pump curve shall not be accepted.

1.04 SERVICE CONDITIONS:

- A. Pumps No. 1, No. 2, and No. 3 are vertical turbine domestic service pumps. These pumps draw water from a below-grade pump can and pump water through a common discharge header in the pump station and into the town's Marsh Road service area. Each pump is connected to a constant speed induction drive motor.

1.05 QUALITY ASSURANCE:

A. General

1. This specification directs special attention to certain features, but does not purport to cover all details of the design, manufacture or installation of the pumping units. The final responsibility for supplying and installing pumping equipment which functions as specified herein rests with the Contractor.
2. Where more than one vertical turbine pump is being supplied, they should all be supplied by the same Pump Manufacturer.
3. Workmanship and the method and materials of construction shall conform to the best practice and highest standards applicable for the design use as specified.
4. Pumping units furnished shall be complete in all particulars and ready for final assembly, installation and operation.
5. Any structural, mechanical, civil, architectural, HVAC, plumbing or electrical changes required by the use of an approved equal product shall be the responsibility of the Contractor.

B. Manufacturers

1. Pump manufacturers shall certify proof of successful operating experience during the last 10 years of five installations of equipment comparable to that specified herein.
2. The electrical variable speed drive equipment (including a/c drive induction motor specified herein) shall be designed and sized by the pump supplier who shall have successfully manufactured, installed and started-up at least ten systems similar to this installation in the past five years. The pump and motor supplier shall assume responsibility for correct operation of the entire a/c drive system.
3. The alternating current controller shall be Allen Bradley, Sq D Altivar as manufactured by Schneider Electric, or approved equal.
4. Vertical turbine pumps for the domestic pumps shall be make and model as outlined by contract drawings.

1.06 REFERENCES:

- A. The following standards form a part of this specification and indicate the minimum standards required:

American National Standards Institute (ANSI)

ANSI B16.1 Standard for Class 125 Cast Iron Flanges and Flanged Fittings

American Water Works Association (AWWA)

AWWA E103 Horizontal and Vertical Line Shaft Pumps

1.07 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF SECTION 01 33 23 SUBMITTALS, SUBMIT THE FOLLOWING:

- A. Complete shop drawings, complete wiring diagrams, complete installation, operating and maintenance instructions, and parts lists.
- B. Prior to shipment, the certified pump curves shall be approved by the Engineer and shall show the actual performance of the pumps under factory testing.
- C. Complete test results on each motor from the routine test as defined in the NEMA standard for a motor of its class and rating to determine that it is free from electrical and mechanical defects and to provide assurance that it meets the design specifications.
- D. The manufacturer's complete initial test for each motor model design tested for efficiency by the following means:

The full load Dynamometer test shall be based on IEEE 112 Method B, per NEMA MG1-12.53.

1.08 STORAGE:

- A. Pump shafts and columns stored on site shall have covered and taped ends for protection. Pump equipment damaged or bent during shipment or storage shall be replaced.
- B. All pump motors shall be stored on site according to motor manufacturer's recommendations until pumps are operational and accepted by the Engineer. Pump motor space heaters shall be energized during storage.
- C. The Contractor shall be responsible for all storage arrangements.

1.09 WARRANTY:

- A. The pump manufacturer and pump motor manufacturer shall each individually and separately warranty that the equipment they supplied under this Section fully meets the criteria specified herein, and shall further warranty that the equipment is free from all defects in materials and workmanship.
- B. The manufacturer's warranties from defects shall contain a provision that the manufacturer shall repair or replace any defects of the pump and motor, to the satisfaction of and at no additional cost to the Owner, for a period of twelve (12) months from the date of Substantial Completion of the project.

PART 2 - PRODUCTS

2.01 VERTICAL TURBINE PUMPS:

A. Vertical Turbine Pump and Discharge Column Assembly

1. The pumps shall be a multistage, vertical turbine type, bell mouth suction, deep-well pumps.
2. The pump bowls shall be strong, close-grained cast iron, free from blow holes, sand holes or other defects. They shall be accurately machined and fitted. The interior of the bowls shall have an enameled finish.
3. Impellers shall be of the enclosed type, bronze or alloy compliant with existing lead standards, finished all over, accurately fitted, securely locked to the shaft, perfectly balanced mechanically and shall be hydraulically move checked in the field.
4. The impeller shaft shall be of 400 series stainless steel and shall be adequately supported by bronze bearings in the top and bottom suction bowls, and by bronze or cutless rubber bearings in the intermediate bowls.
5. The line shafting shall be of 400 series stainless steel, minimum 1-inch for 20 horsepower motor and 1-3/16-inches for 50 horsepower motor and shall operate the pump without distortion or vibration. Shaft bearings, when installed, shall be of the replaceable water-lubricated, cutless-rubber type, which can run dry at starting until water reaches them. They shall be held in place by bronze bearing retainers which shall maintain shaft alignment. Shaft coupling shall be stainless steel. Shaft lengths shall be the same as column lengths.
6. A threaded type spacer coupling shall be provided in that portion of the shaft between the motor and discharge head so that by disconnecting the coupling, the mechanical seal can be easily removed.
7. The column pipe shall be furnished in uniform interchangeable 5 foot (maximum) sections and shall be threaded type. Proper column sizing shall be the responsibility of the manufacturer.

B. Pump Discharge Head

1. The pump discharge head shall be of cast iron, surface discharge type with a suitable machined shoulder for mounting the motor and an integral flange to bolt to the top flange of the pump column and recessed as necessary where applicable. Pump discharge head shall be equipped with threaded tap with plug for pressure gauge.
2. The head shall have a base mounting flange with at least 4 anchor-bolt holes. The head shall be furnished by the pump manufacturer and expressly designed for the pump furnished.
3. It shall have a cartridge type mechanical seal as manufactured by John Crane or approved equal.

4. The head shall be designed with adequate strength to support the electric motor, the pump and the reactions of the pump and motor.
5. A steel soleplate of dimensions recommended by the manufacturer shall be furnished with the unit and machined to suit. The soleplate shall be grouted and anchored to the square concrete pad by four 3/4-inch diameter bolts.
6. The pump head and baseplate shall be capable of withstanding all end and side thrusts imposed by the pump during operation.
7. The discharge shall be flanged, faced, and drilled in accordance with the ANSI Standard for Cast Iron Flanges and Flanged Fittings, Class 125 (B16.1).

C. Inverter Duty Motors

1. Motors shall be premium efficiency, inverter duty, models as manufactured by Baldor, General Electric, U.S. Electrical Motors, or approved equal.
2. The pumps shall be driven over the specified speed range by a/c motors sized to operate in conjunction with variable voltage/variable frequency rectified power and provide 100 percent motor torque and horsepower rating at 1.0 service factor.
3. The motor base speed shall be selected so that the maximum operating speed of the pump and motor are compatible.
4. Motors speed shall not exceed 1800 rpm.
5. The a/c motors for variable frequency applications shall be 3 Phase, 60 Hertz, 460 Volts. They shall be rated for operation in 40°C ambient at 1.15 service factor for constant speed operation and 1.0 service factor for operation on variable frequency, variable voltage. The motor shall have a KVA per horsepower rating of NEMA code letter G or better.
6. The motors shall be weather protected enclosure premium efficiency design, cast iron construction, mill and chemical duty, NEMA design B, Class B insulation with the following minimum features:
 - a. Cast iron conduit boxes, diagonally split neoprene gasketed, rotatable 360° in 90° increments.
 - b. Grounding clamp in conduit box.
 - c. Removable lifting lug.
 - d. Permanently numbered non-wicking leads.
 - e. Lead separator between motor frame and conduit box.
 - f. Zinc-plated hardware.

- g. Stainless steel nameplate.
 - h. Stator winding shall be copper construction.
 - i. Stator and rotor completely epoxy coated for corrosion protection.
 - j. Motors for vertical pump service shall be solid shaft type designed so as to take the full thrust of the pump.
 - k. The motors shall have two sets of ball bearings. The upper set shall be high thrust, adequate to carry the thrust load of the motor and pump parts imposed upon it during pump start-up and operation. A non-reverse ratchet shall be furnished with the motor of the ball or pin type.
 - l. The motors shall develop sufficient torque to start the pump and bring it up to full speed when the pump is full of water and operate the pump at any point of its characteristic curve without entering into the service factor.
7. Each motor shall be designed for premium efficiency, inverter duty with AEGIS shaft grounding rings (for inverter duty applications).

2.02 A/C VARIABLE FREQUENCY CONTROLLER:

A. GENERAL:

- 1. The alternating current (a/c) drive systems outlined below shall provide variable speed to the vertical turbine high lift pumps. The Contractor shall provide new VFDs to control the pumps. The drives shall be sized to meet the amperage conditions specified in subsection 2.02.
- 2. All equipment shall comply with the applicable requirements of the latest standards of ANSI, IEEE, and NEMA. The a/c controllers shall be U.L. listed and CSA approved. The electrical equipment, the design, construction, and installation thereof shall comply with all applicable provisions of the National Electric Code.
- 3. The variable frequency drive shall convert incoming fixed frequency three phase AC power into a variable voltage and variable frequency utilizing pulse width modulation.
- 4. The VFD shall include a full wave diode bridge rectifier. The drive shall maintain a displacement power factor near unity regardless of speed and load.
- 5. The drive shall utilize dc capacitors to filter out bus ripple and provide smooth dc power to the transistor section.
- 6. The output waveform shall closely approximate a sine wave. The VFD shall utilize IGBT transistors to produce a pulse width modulated output. SCR's are not acceptable.

7. The drives shall have a full load amp rating which exceeds or meets NEC Table 430-150. The drive shall be able to provide full rated output current continuously, and shall be able to provide 110% of its variable torque rating and 150% of its constant torque rating for one minute.
8. The variable frequency drive shall utilize voltage vector control to reduce harmonics and torque ripple.
9. The variable frequency drive shall produce a maximum 3° F rise in motor temperature during operations.

B. VARIABLE SPEED A/C CONTROLLER:

1. The alternating current controller shall be Allen Bradley, Sq D Altivar as manufactured by Schneider Electric, or approved equal.
2. The VFD selected must be able to source the motor's full load amperage, on a continuous basis, and be capable of running the motor at nameplate RPM, voltage, current and slip without utilizing the service factor of the motor. The variable speed a/c controller shall convert the supply 480 voltage a/c (+10, -10%), 3 phase, 60 Hertz utility power to variable voltage, variable frequency a/c rectified power to control the speed of the pumps.
3. The controller shall be heavy duty rated for 480 Vac, and shall provide microprocessor based control for three-phase induction motors. The controller's full load output current rating shall be based on 40⁰ ambient and no less than a 3.6 kHz switching frequency to reduce motor noise and avoid increased motor losses.
4. The controller shall be compliant with IEEE-519 standard for allowable total harmonic distortion.
5. The manufacturer may utilize harmonic filter traps, 6-, 12-, or 18- pulse rectifiers, active filters, or active converter sections as best fit the individual application.
6. The controller shall be located in a NEMA 12 enclosure containing the power conversion unit plus the associated regulator firing circuits. The enclosure shall have a thermostatically controlled cabinet fan.
7. The controller shall be equipped with automatic shut-off under output short circuit conditions or when the load current exceeds 110 percent of rated current.
8. The controller shall be equipped with line transient protection to prevent power line transients from harming the controller.
9. The a/c controller shall respond to a local, door-mounted manual adjusting speed potentiometer (0-10 vdc) **as well as** an automatic closed loop speed control signal. The varying electronic signal between the a/c variable speed controller and the computer or microprocessor will be 4-20 mA. The control signal will be set so that

4 mA is the low speed and 20 mA is the maximum speed. The door-mounted potentiometer shall become effective when the 3-position control switch is set to "Hand". The 4-20 mA signal reference from SCADA shall be in control when the 3-position control switch is set to "Auto".

10. In the automatic mode, the variable frequency drive shall have an adjustment so that the input signal of 4 mA can be set to equal the minimum drive speed which corresponds to a minimum pump discharge rate. The 20 mA signal shall be adjustable to the maximum discharge rate.

11. Each pump and motor combination shall be controlled by an individual a/c controller and shall be capable of operating under any combination of the following conditions without mechanical or electrical damage.

1. Ambient: 0° to 40°C
2. Relative Humidity: 0 to 90% Non-condensing
3. Vibration: 0 to 0.5G
4. Altitude: 0 to 3,300 feet

12. CONTROL SYSTEM shall be designed with the following items:

- a. The output of the drive controller shall be equipped with an output "M" contactor for positive disconnect of the motor.
- b. A motor overload relay integrally mounted and wired in the controller to provide continuous motor overload protection.
- c. Input line fuses.
- d. Isolated operator's controls for operator's safety.
- e. The VFD shall have preset adjustable acceleration and adjustable deceleration times. The times shall be adjustable from 0-3200 seconds.
- f. The VFD shall have a base/nominal frequency adjustable from 25-120 Hz.
- g. Control Adjustments/Guidelines: Shall be based on the specific requirements of the pump motor. The VFD must follow the following guidelines for the motor provided:

Maximum Speed - 1.00 x Full Load Speed
Minimum Speed - 0.67 x Synchronous Speed (3450 x 0.67 = 2311 rpm)
or 42 Hertz
Volts/Hertz Rated - maintain constant volts to Hertz ratio. The controls must be rated the same as the motor nameplate.
Minimum Starting Current – 3 times full load current to start the motor

Note: Proper, class 10, quick trip, overload protection must be used at all times. As a minimum, overloads must trip at five times full load

current within 10 seconds on any phase.

- h. Each controller shall have an HCMP or thermal magnetic breaker to act as an integrally mounted incoming a/c line disconnect circuit breaker with a through-the-door interlocking handle and padlock lockout. It shall be mechanically interlocked with the unit door to prevent access unless the disconnect is in the OFF position. Padlocking facilities shall be provided to positively lock the disconnect in the OFF position with from one to three padlocks with the door open or closed.
- i. Each a/c controller shall provide individual contacts to monitor and output for remote indication for the following items.
 - 1. Pump/motor run indication (dry contact closure on run).
 - 2. Instantaneous Electronic Trip (alarm) indication.
- j. The controller shall have contacts for a safe ramped shutdown for emergency stop (overrides local/remote switch function).
- k. The a/c controllers shall be capable of being started and stopped from both the local and the remote location.
- l. The following devices shall be mounted and wired on the controller door:
 - 1. Digital operator keypad controller with menu.
 - 2. Hand-Off-Auto three position selector switch for start/stop command.
 - 3. Speed potentiometer (0-10 vdc)
 - 4. Each device on the controller door shall have a permanent legend plate outlining the function. A main service legend plate shall be affixed to the top portion of the controller door. Legend plates shall be constructed of engraved lamincord and screwed to cabinet door.
- m. The digital operator keypad shall be able scroll through the keypad menu to view the following:
 - 1. Monitor
 - 2. Operate
 - 3. Parameter setup
 - 4. Actual parameter values
 - 5. Active faults
 - 6. Fault history
 - 7. LCD contrast adjustment
 - 8. Information to indicate the standard software and optional features software loaded

- n. The following setups and adjustments, at a minimum, are to be available:
 - 1. Start command from keypad, remote or communications port
 - 2. Speed command from keypad, remote or communications port
 - 3. Maximum and minimum speed limits
 - 4. Acceleration and deceleration times, two settable ranges
 - 5. Critical (skip) frequency avoidance
 - 6. Torque limit
 - 7. Multiple attempt restart function
 - 8. Manual speed adjusting potentiometer
 - 9. Catch a spinning motor start or normal start selection
 - 10. Programmable analog output
 - 11. Proportional/Integral process controller

- o. The VFD shall provide dry contacts for the following output requirements:
 - 1. Run Status
 - 2. Failure
 - 3. HOA “not in auto mode”

- p. The keypad shall be able to display the following monitoring functions at a minimum:
 - 1. Output frequency
 - 2. Output speed
 - 3. Motor current
 - 4. Motor torque
 - 5. Motor power
 - 6. Motor voltage
 - 7. Operating hours (resetable)
 - 8. Total operating days counter
 - 9. Voltage level of analog input
 - 10. Current level of analog input
 - 11. Digital inputs status
 - 12. Digital and relay output status

- q. The VFD’s shall include the following protective features at a minimum:
 - 1. Overcurrent
 - 2. Overvoltage
 - 3. Inverter fault
 - 4. undervoltage
 - 5. Phase loss
 - 6. Output phase loss
 - 7. Microprocessor failure

C. Alternating Current (A/C) Induction Drive Motors for Variable Frequency Applications

1. The electrical drive equipment specified herein (including a/c drive controller and a/c drive induction motor) shall be designed and sized by the supplier who shall assume responsibility for the correct operation of the system.
2. The pumps shall be driven over the specified speed range by a/c motors sized to operate in conjunction with variable voltage/variable frequency rectified power and provide 100 percent motor torque and horsepower rating at 1.0 service factor.
3. The motor base speed shall be selected so that the maximum operating speed of the pump and motor are compatible.
4. Motors speed shall not exceed 1800 rpm.
5. The a/c motors for variable frequency applications shall be 3 Phase, 60 Hertz, 460 Volts. They shall be rated for operation in 40°C ambient at 1.15 service factor for constant speed operation and 1.0 service factor for operation on variable frequency, variable voltage. The motor shall have a KVA per horsepower rating of NEMA code letter G or better.
6. The motors shall be open protected enclosure premium efficiency design, cast iron construction, mill and chemical duty, NEMA design B, Class B insulation with the following minimum features:
 - a. Cast iron conduit boxes, diagonally split neoprene gasketed, rotatable 360° in 90° increments.
 - b. Grounding clamp in conduit box.
 - c. Removable lifting lug.
 - d. Permanently numbered non-wicking leads.
 - e. Lead separator between motor frame and conduit box.
 - f. Zinc-plated hardware.
 - g. Stainless steel nameplate.
 - h. Stator winding shall be copper construction.
 - i. Stator and rotor completely epoxy coated for corrosion protection.
 - j. Motors for vertical pump service shall be hollow shaft type designed so as to take the full thrust of the pump.

- k. The motors shall have two sets of ball bearings. The lower radial bearing shall be grease lubricated. The upper set shall be oil lubricated and combination radial and thrust type, adequate to carry the thrust load of the motor and pump parts imposed upon it during pump start-up and operation. A non-reverse ratchet shall be furnished with the motor of the ball or pin type.
- l. The motors shall develop sufficient torque to start the pump and bring it up to full speed when the pump is full of water and operate the pump at any point of its characteristic curve.
- 7. Each motor shall be designed for the highest efficiency standardly available in the marketplace.
- 8. The motors shall be tested as specified in this section.

2.04 FACTORY TESTING:

All bowl assemblies shall be tested in the shop of the manufacturer for head, capacity, efficiency, and brake horsepower at 50%, 65%, 85% and 100% of the rated speed. Certified copies of the results in the form of pump characteristic curves shall be furnished to the Engineer for review prior to shipment.

2.05 PAINTING:

- A. Potable water pumps shall come factory primed and finish painted with Tnemec 141 NSF 61 (8 mil). Pumps shall be delivered with 1 quart of touch-up paint and applied in the field.
- B. Carbon steel pump can interior and exterior to be coated with NSF61 Tnemec 141 Pota-Pox epoxy or 3M Scotchkote 134 fusion bonded epoxy.
- C. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. The pumps shall be assembled and installed in strict accordance with the manufacturer's recommendations and as approved by the Engineer.
- B. Pump equipment damaged or bent during shipping or storage shall be replaced.
- C. All pump motors shall be stored on site according to motor manufacturer's recommendations until pumps are operational and accepted by the Engineer.

3.02 FIELD ACCEPTANCE TESTS:

- A. After all pumps have been installed and connected and after inspection, operation, and adjustment has been completed by the manufacturer's representative, the pumping equipment shall be field tested in the presence of the Engineer, for overall wire to water efficiency and for general performance and fitness for the service specified. Results of these tests shall be submitted to the Engineer.
- B. The quantity of water discharged by the pumps shall be measured by the equipment to be installed.
- C. Pumping heads shall be measured by pressure gauges, specially calibrated, and electrical input by the use of suitable instruments. Duration of the tests shall be as determined by the Engineer.
- D. If a pumping unit fails to deliver the design capacity under the design pumping heads, or if the wire to water efficiency under the design head fails to reach the efficiency stated in the specification, the Contractor shall, at his own expense, on the written request of the Engineer, replace the motor, impellers, or any other parts, or provide any other required modifications to improve the unit until the specified capacity and efficiency are fulfilled.
- E. All vertical pumps and drives shall be field balanced by a qualified technician using portable balancing equipment. The amplitude of vibration measured near the top of the drive shall not exceed 1.5 mils after final balancing. All balancing shall be done in the presence of the Engineer. The qualified technician shall submit a report to the Engineer showing final test results. The pump manufacturer shall be responsible for making all arrangements for field balancing.
- F. At the discretion of the Owner or his representative, an independent vibration analysis may be conducted on each of the vertical turbine pumps. This testing shall be open to the Contractor and the manufacturer.

3.03 MANUFACTURER'S SERVICES:

- A. The services of a factory trained manufacturer's representative shall be provided as specified herein. The manufacturer's on-site representative shall have the at least 50 installations of vertical turbine pumps.
- B. Services to be provided

For vertical turbine pumps, the service representative shall be responsible for complete component inspection on site after delivery and shall assist in the correct assembly of the components for a minimum period of **two (2)** eight-hour days.

1. For inspection and check out of erected equipment.
2. For start-up services and supervision.
3. For complete instruction of the operating personnel.

- C. The minimum period of time herein specified does not relieve the manufacturer from providing sufficient time to satisfactorily complete the required service functions.
- D. The manufacturer's representative shall certify in writing that the pumps and variable speed drives have been properly installed.
- E. The Owner reserves the right to video tape the instruction of the operating personnel for future use in training.

3.04 SPARE PARTS:

- A. A/C Motors: For each motor, provide
 - 1. Front and Back End (upper and lower bearing)
 - 2. Fan Cover
 - 3. Fan Cover Plug
 - 4. Front End Outer Fan
 - 5. Conduit Box and Cover
- B. Provide all other spare parts as recommended in the manufacturer's standard operations and maintenance information.

END OF SECTION

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October 14, 2021

Mr. Samuel Kenney, PE
Weston & Sampson Engineers, Inc.
100 International Drive, Suite 152
Portsmouth, NH 03801

**RE: Geotechnical Engineering Report
Marsh Road Water Pump Station
Hudson, NH**

INTRODUCTION

Weston & Sampson Engineers, Inc. (Weston & Sampson) is pleased to present this geotechnical engineering report for the proposed Marsh Road Pump Station project located near Riviera Road in Hudson, New Hampshire. Our understanding of the proposed project is based on review of the Town of Hudson's Request for Proposal for the project, Weston and Sampson's Proposal for Engineering Services dated May 7, 2021, and correspondence with the Town of Hudson and project team.

Recommendations provided in this report are based on our current understanding and interpretation of subsurface conditions encountered in the explorations. Our recommendations may require adjustment and additional explorations may be needed if changes are made to the project design or approach.

EXISTING CONDITIONS

The existing Marsh Road Pump Station (the site) is located in the northeast area of Hudson as shown in Figure 1 – Project Locus. The site is bounded by residential properties and Riviera Road to the south, and wooded areas to the east, north, and west, as shown in *Figure 2 – Aerial Image*. The site includes a 2.0-million-gallon water storage tank, a below-grade pump station vault south of the water tank, an approximately 11 ft. x 19 ft. concrete pad supporting a generator, a paved driveway, and subsurface water and electric utility pipes. Existing site features are shown in *Figure 3 – Site Plan*. The existing pump station measures approximately 6 ft. deep x 20 ft. wide and is supported approximately 10 ft. below the ground surface. The pump station vault contains the water storage tank valve vault and controls. Bedrock outcrops are present east of the water storage tank.

Ground surface elevations at the site generally range from approximately El. 283 to El. 288 ft. and are generally level or slope gently upwards to the southeast. The ground surface slopes down and away from the west side of the site at approximately 2.5H:1V. Elevations provided in this report are in feet and reference the North American Vertical Datum of 1988 (NAVD88).

PROPOSED CONDITIONS

Plans indicating the proposed pump station building location, configuration, and grading have not been developed at the time of this report. We understand however, that the preferred building location is approximately 10 ft. east of the existing pump station vault. We also understand that the building will likely measure approximately 10 ft. wide by 20 ft. long and contain a below-grade vault area. The depth of the vault and proposed grading were not determined at the time of this report, but we assume the vault will be approximately 5 ft. deep and grading around the building will be within approximately 2 ft. of existing grades. New utilities will likely include subsurface pipes connecting the existing pump station vault to the new pump station building.

SUBSURFACE CONDITIONS

Geologic Setting

Information from the 1976 Surficial Geologic Map of the Nashua North Quadrangle prepared by Carl Koteff indicates the site is located in an area of glacial till consisting of non-sorted to poorly sorted mixtures of clay, silt, sand, pebbles, cobbles, and boulders. Thickness of the till varies but generally is indicated to be less than 20 ft. except beneath drumlins where thicknesses may exceed 50 ft.

Review of the 1997 Bedrock Geologic Map of New Hampshire prepared by Lyons, J.B., Bothner, W.A., Moench, R.H., and Thompson, Jr, J.B., indicates bedrock in the site vicinity consists of the Two-mica Granite of Northern and Southeastern New Hampshire Formation consisting of gray, two-mica granite, locally grading to tonalite.

Subsurface Explorations

Subsurface conditions at the site were explored on September 13, 2021 by advancing four borings (B-1A, B-1B, B-1C, and B-2) to depths up to approximately 9.5 ft. at the approximate locations shown in **Figure 3**. Weston & Sampson geotechnical engineering staff observed the borings in the field and prepared logs for each boring.

The borings were completed by New England Boring Contractors, Inc. of Derry, NH using a truck-mounted drill rig and drive-and-wash or hollow-stem auger drilling methods with 4-inch inside-diameter casing or 2.25-inch inside-diameter augers, respectively. Standard penetration tests (SPTs) and sampling were conducted in the borings by driving a 24-inch-long by 1-3/8 inch inside diameter (2 inch outside diameter) split spoon sampler with blows from a 140 lb. automatic hammer falling 30 inches per blow. Sampling intervals were generally every 2 ft. No sampling was completed in B-1B. Rock core sampling in B-1C was completed using a NX-sized core barrel.

Split spoon refusal, where encountered, is defined as 50 hammer blows for less than 6-inches of sampler penetration. Auger or roller bit refusal is defined as no discernable advancement of the augers or roller bit over a period of approximately 5 minutes.

Subsurface Conditions

Subsurface conditions in the borings below surficial topsoil generally consisted of fill above native layers of sand and gravel. Drilling refusal was encountered in each boring as discussed below. The native soils encountered in the borings were generally consistent with mapped surficial geology.

Descriptions of the subsurface conditions encountered in the borings are included in the boring logs in **Attachment A**. The major strata encountered in the borings are described below. Variations may occur and should be expected outside and between boring locations. The Unified Soil Classification System (USCS) designation(s) for each native soil stratum is included in the descriptions below in parentheses.

Topsoil – Approximately 3.5 in. and 4 in. of topsoil was encountered in B-1A and B-2, respectively. Topsoil thickness was not measured in B-1B and B-1C.

Fill – Approximately 2 ft. of loose to medium dense fill was encountered in B-1A and B-2. The fill generally consisted of fine to coarse SAND with few to little non-plastic fines and trace to little fine gravel or fine to coarse GRAVEL with some fine to coarse sand and trace non-plastic fines. Fill was likely present in B-1B and B-1C, but sampling was not completed in B-1B and sampling started at approximately 3 ft. in B-1C.

Native Sand – A layer of dense to very dense sand was encountered in B-1A and B-2. The sand layer generally consisted of fine to coarse SAND with some fine to coarse gravel and trace to few non-plastic fines (SP, SP-SM).

Native Gravel – A layer of very dense gravel was encountered at the start of sampling (3 ft.) in B-1C and below the sand stratum in B-2. The gravel layer generally consisted of fine to coarse GRAVEL with some fine to coarse sand and trace non-plastic fines (GP, GP-GM).

Refusals – Refusals were encountered in all borings at depths ranging from approximately 2.8 to 9 ft. Rock coring was completed in B-1C to confirm the presence of bedrock at this location. Rock coring was not completed at refusal depths in other borings. Refusals at these locations, therefore, could be on cobbles, boulders, and/or bedrock.

Bedrock – Bedrock was cored below the refusal depth in B-1C from approximately 4.5 ft. to 9.5 ft. The bedrock consisted of hard, slightly weathered, gray, medium to coarse grained GRANITE, with horizontal to low angle joints, close to moderate spacing, and slight iron staining and weathering on joint surfaces. The rock quality designation (RQD) provides an indication of the quality of a bedrock mass and is determined by summing the sound pieces of recovered core greater than 4 inches in length each and dividing by the total length of the core run. The rock core had a recovery of 95 percent and RQD of 77 percent, indicating good quality rock.

Groundwater – Groundwater was not observed in the borings. We anticipate that groundwater levels will fluctuate with season, variations in precipitation, construction in the area, and other factors. Perched groundwater conditions could exist close to the ground surface, especially during and after extended periods of wet weather.

GEOTECHNICAL DESIGN RECOMMENDATIONS

General

The proposed water pump station building can be supported on shallow spread footings bearing in the dense to very dense sand and gravel layers or on properly constructed Structural Fill overlying these layers or the bedrock surface. The primary geotechnical considerations for the proposed project include the presence of undocumented fill and shallow bedrock in the preferred water pump station building area and the close proximity of the existing below-grade pump station vault structure to the preferred pump station location. Recommendations for design and construction of shallow foundations are provided in the following sections.

Up to approximately 2 ft. of undocumented fill was encountered in the borings. The fill is not suitable for support of the proposed pump station foundation and slab and should be removed from within the zone-of-influence (ZOI) beneath the proposed foundation and slab. The ZOI is defined as planes extending horizontally away from the bottom edges of footings and slabs for 2 ft. in all directions then down and away at 1H:1V slopes to the intersection with suitable native soils.

All borings encountered refusal at depths ranging from approximately 2.8 to 9 ft. Rock core sampling was completed in B-1C from approximately 4.5 to 9.5 ft. to confirm the presence of bedrock and to evaluate the quality of bedrock at this location. Excavation of bedrock and/or large boulders is expected if foundation and subsurface utility excavations will extend deeper than refusal and top of bedrock depths. We recommend the project budget and schedule include contingencies for difficult excavation including bedrock excavation and boulder removal. Bedrock removal methods that limit vibration should be used so that adjacent structures and utilities are not damaged. To potentially reduce the volume of bedrock removal required, consideration should be considered to locate the proposed pump station building to the northwest of the existing pump station vault. Boring B-2, which was completed in this area, encountered refusal at approximately 9 ft. below the ground surface.

As previously discussed in this report, the current preferred location of the proposed pump station building is approximately 10 ft. east of existing pump station vault. The proposed pump station building should be located a sufficient distance away so that the existing pump station vault is not within the ZOI of the proposed building foundation.

Shallow Foundations

Footings bearing on dense (or denser), undisturbed, native sand or gravel, or on properly constructed Structural Fill overlying these materials or the bedrock surface, can be designed using an allowable bearing pressure of 5,000 pounds per square foot (psf). The allowable bearing pressure can be increased to 6,600 psf to resist temporary wind and seismic loads provided load eccentricities are within the middle third of the footing. Resistance to lateral loads can be obtained by a passive equivalent fluid unit weight of 250 pcf, ignoring the top 12 inches of embedment, and by a footing base friction coefficient of 0.45.

Undocumented fill should be completely removed from within the ZOI beneath all foundation areas. All foundation subgrades should be observed by a Weston & Sampson geotechnical engineer prior to placement of overlying fill, concrete forms, and reinforcing steel (rebar).

If bedrock is encountered during foundation excavation, a minimum of 12-inches of compacted Structural Fill should be installed between the top of the bedrock and bottom of foundations. Footings should not bear partially on the bedrock surface and soil material as abrupt differential settlement between the support materials could occur.

The foundation should be designed in accordance with the provisions of the 2015 Edition of the International Building Code (IBC) as adapted by the State of New Hampshire. Footings should be embedded at least 4 ft. below the nearest proposed adjacent ground surface exposed to freezing. Interior footings not exposed to freezing should be embedded at least 18-inches below the lowest overlying floor slab elevation. These footings may require special frost protection measures if constructed during freezing conditions. Shallow foundations constructed as recommended herein are anticipated to undergo total and differential settlements of less than 1 inch and ½ inch, respectively.

Seismic Site Class

Seismic site class was determined in accordance with the 2015 IBC using a weighted average of SPT blow counts in the upper 100 feet of soil at a site. Based on the results of our explorations and analyses, we recommend the subject project be evaluated using parameters associated with Site Class C.

Liquefaction can occur in loose, saturated, granular soils. Strong shaking, such as that experienced during earthquakes, can cause sudden loss of shear strength, densification, and subsequent settlement of these soils. We evaluated the potential for liquefaction in accordance with the latest provisions of the IBC using the soil types and consistencies encountered in our explorations and interpretation of the existing subsurface information referenced above. Based on our evaluation, the risk of structurally damaging ground deformations due to liquefaction is low.

Slab-On-Grade

The building slab should be designed and constructed in accordance with recommendations contained in the latest editions of ACI Committee Reports 360R and 302.1R. Based on subgrade preparation procedures recommended herein and the anticipated soil conditions, a modulus of subgrade reaction (k) of 250 pounds per cubic inch (pci) is recommended for slab-on-grade design.

All fill should be removed below the building slab to expose the native sand or gravel layers. If bedrock is encountered in the slab excavation, the bedrock should be removed a minimum of 12-inches below the bottom of the slab.

Concrete slabs should be supported on a minimum 12-inches of underslab fill meeting the requirements of New Hampshire Department of Transportation (NHDOT) Item 304.4 Crushed Stone (Fine). Underslab fill should be placed in 10-inch maximum loose lifts, with each lift compacted to at least 95 percent of the materials maximum dry density as determined by ASTM D1557.

The building slab supporting loads up to 250 psf and bearing on materials discussed above are expected to induce less than 1-inch of settlement.

Embedded Vault Walls

Embedded vault walls should be designed to resist hydrostatic forces over the full height of the wall (i.e. water at the ground surface behind the wall). Lateral earth pressures should be calculated using an equivalent fluid unit weight of 95 pcf, which assumes saturated backfill, a level backfill surface, and the top of the walls are restrained from rotation (i.e. connected to floor slabs, stem walls, etc.).

A uniform lateral pressure of 150 psf should be added to the above pressures and applied over the full backfill height of all walls to account for vertical surcharge pressures at the tops of walls up to 300 psf.

CONSTRUCTION RECOMMENDATIONS

Site Preparation

The site should be prepared by removing all vegetation and surficial topsoil from the pump station building area and a 5 ft. perimeter around this area. Site preparation for earthwork will also require removal of all existing fill from within the ZOI beneath the proposed building foundation to expose native sand and gravel or the bedrock surface. Excavations required for site preparation should be brought back to grade with Structural Fill as recommended below. In general, the sides of these excavations should be sloped back flatter than 1.5H:1V to allow proper compaction of the interface between existing soil and new fill.

Excavation Considerations

Excavations will be required for site preparation, grading, and construction of foundations, slabs, and below-grade areas. Based on subsurface conditions encountered in our borings, excavations will likely extend through existing fill, native sand and gravel, and bedrock. Some variability should be expected, and we recommend that the project budget and schedule include contingencies for variable subgrade conditions, including removal of boulders and bedrock.

Surface water should be controlled during construction and prevented from eroding temporary slopes and disturbing excavation and subgrade materials. If excavations encounter groundwater, moderate to severe caving should be expected where seepage is present. Flowing conditions are likely where granular soils and groundwater seepage are present.

All excavations, fill placement and compaction, and foundation construction should occur in-the-dry. Dewatering to maintain dry excavations is not anticipated for shallow foundation construction. However, depending on excavation depths in other areas, dewatering could be necessary. The dewatering system should be capable of lowering the groundwater table at least 2 ft. below the anticipated excavation depths and be kept operational until fill placement and compaction, and foundation construction have been completed to a level of at least 2 ft. above the groundwater table elevation. The dewatering system should be capable of handling variable flow rates and should be the responsibility of the Contractor.

Temporary excavation support may be required depending on depths of excavations and the need to support adjacent utilities and structures. Excavation support, if necessary, should be the responsibility of the Contractor and designed by a Professional Engineer licensed in the State of New Hampshire. All excavations should be made in accordance with all applicable local and OSHA safety regulations.

Bedrock Excavation

Based on the subsurface conditions encountered in our explorations and anticipated foundation depths, bedrock excavation could be necessary for shallow foundation construction. Bedrock should be removed a minimum of 12-inches below proposed foundations, slab, and utilities.

The proposed pump station building will be located next to critical infrastructure including a water storage tank, a below-grade pump station vault, and subsurface utilities. Bedrock removal methods such as mechanical hoe-ramming and blasting will cause vibrations that could damage these structures. We therefore recommend that non-explosive demolition agents such as expansive demolition grout be used to facilitate bedrock removal. All loose, fragmented rock should be removed below all foundations, slabs, and utilities, to expose the undisturbed, competent bedrock surface.

A condition survey of nearby structures, residences, and utilities should be completed prior to rock excavation and/or blasting. Vibration (seismic) monitoring should be completed in conjunction with rock blasting.

Subgrade Preparation and Protection

Following site preparation and excavation to required subgrade elevations, the sand and gravel subgrades should be recompact until dense and stable with several passes of a minimum 700-pound vibratory plate compactor, or equivalent effort. Weston & Sampson should be contacted to evaluate the stability of subgrades prior to placement of foundation forms, rebar, and overlying materials.

Soft and/or disturbed areas will require over-excavation and backfilling with compacted angular crushed stone or compacted Structural Fill as recommended by the geotechnical engineer. A geosynthetic separation layer between soil subgrades and crushed stone backfill may be required. We recommend that a geosynthetic used for separation consist of a nonwoven geosynthetic with an AOS of #70 to # 100 sieve, and a minimum puncture resistance of at least 120 pounds (such as Mirafi 180N or equivalent).

Soils containing more than trace amounts of silt are highly susceptible to softening and disturbance by construction activity during wet or freezing weather. Subgrade protection should be the responsibility of the contractor and special precautions and protective measures appropriate for the weather and traffic conditions during construction should be used during earthwork and foundation construction to preserve the integrity of subgrades.

If construction occurs during freezing conditions, insulating blankets, heaters, or other suitable measures should be employed to prevent foundation subgrades from freezing until the foundations are backfilled sufficiently to prevent frost from reaching the structure subgrades. The Contractor should be responsible for subgrade protection.

Trenches

Utility trench excavations should be completed as recommended above. Pipe bedding should be installed in accordance with the pipe manufacturers' recommendations. If groundwater seepage or standing water is present in the base of utility trench excavations, we recommend over-excavating the trench by 12 to 18-inches and placing trench stabilization material in the base. Trench stabilization material should consist of well-graded, crushed

stone or crushed gravel with a maximum particle size of 4 inches and be free of deleterious materials. The percent passing the #200 sieve should be less than 5 percent by weight when tested in accordance with ASTM C 117.

Trench backfill above the pipe zone should consist of imported granular sand and gravel with no more than 10 percent passing a #200 sieve such as Structural Fill or granular soils from on-site excavations meeting the above requirements. Trench backfill should be placed in 6-inch maximum loose lifts and compacted to 92 percent relative to ASTM D1557 and to 95 percent of maximum dry density as determined by ASTM D1557 within 2 feet of finished grades. Construction of hard surfaces, such as sidewalks or pavement, should not occur within two weeks of backfilling.

Fill

Imported fill meeting the requirements of NHDOT Item 304.2 Gravel or Item 304.3 Crushed Gravel and having a maximum particle size of 3-inches is recommended for use as Structural Fill within the ZOI beneath new foundations and slabs.

On-site granular soils meeting the grain size requirements for Structural Fill may be used as such provided they are free of organics, contamination (including metals, VOCs, SVOCs, etc.), and other deleterious materials. On-site soils not meeting the requirements for Structural Fill but containing less than approximately 20 percent passing the #200 sieve may be suitable for re-use as Common Fill outside the foundation ZOI. Common Fill should be compacted to a minimum 92 percent of the materials maximum dry density as determined by ASTM D1557.

All fill should be placed in maximum 10-inch thick loose lifts (measured prior to compaction) with each lift compacted to at least 95 percent of maximum dry density as determined by ASTM D1557 (modified proctor) for the specific fill material. Density testing should be completed on each lift of fill during construction to confirm compaction requirements are met.

LIMITATIONS

We have prepared this report for use by the Town of Hudson, and members of the design and construction team for the subject project and this site only. The data and report can be used for estimating purposes, but our report, conclusions, and interpretations should not be construed as a warranty of the subsurface conditions and are not applicable to other sites. Additional information about interpretation and use of this report is included in ***Attachment B***.

Explorations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect subsurface conditions that may exist between exploration locations. If subsurface conditions differing from those described are noted during excavation and construction, we should be contacted and reevaluation will be necessary.

Site development plans and design details were considered preliminary at the time this report was prepared. If changes are made in site grades, configuration, design loads, or type of construction for the structure, the conclusions and recommendations may not be applicable. We should be consulted to review final design drawings and specifications to see that our recommendations are suitably followed. If design changes are made, we should be retained to review our conclusions and recommendations and provide a written

evaluation or modification. Additional geotechnical engineering analyses and explorations may be necessary.

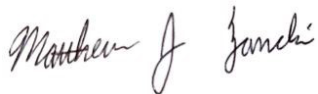
The recommendations in this report are preliminary as actual subsurface conditions may differ from those interpreted based on our subsurface explorations. For our recommendations to be considered final, we must be retained to observe the actual subsurface conditions encountered during construction. Our observations will allow us to interpret the actual conditions present during construction and adapt our recommendations if needed.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty, expressed or implied, is given.

It has been a pleasure assisting you with this project and we look forward to our continued involvement. Please call if you have any questions.

Sincerely,

WESTON & SAMPSON ENGINEERS, INC.



Matthew J. Zanchi, PE (NH)
Project Engineer



Thomas J. Strike, PE
Team Leader

Attachments:

Figure 1 – Project Locus (1 page)

Figure 2 – Aerial Image (1 page)

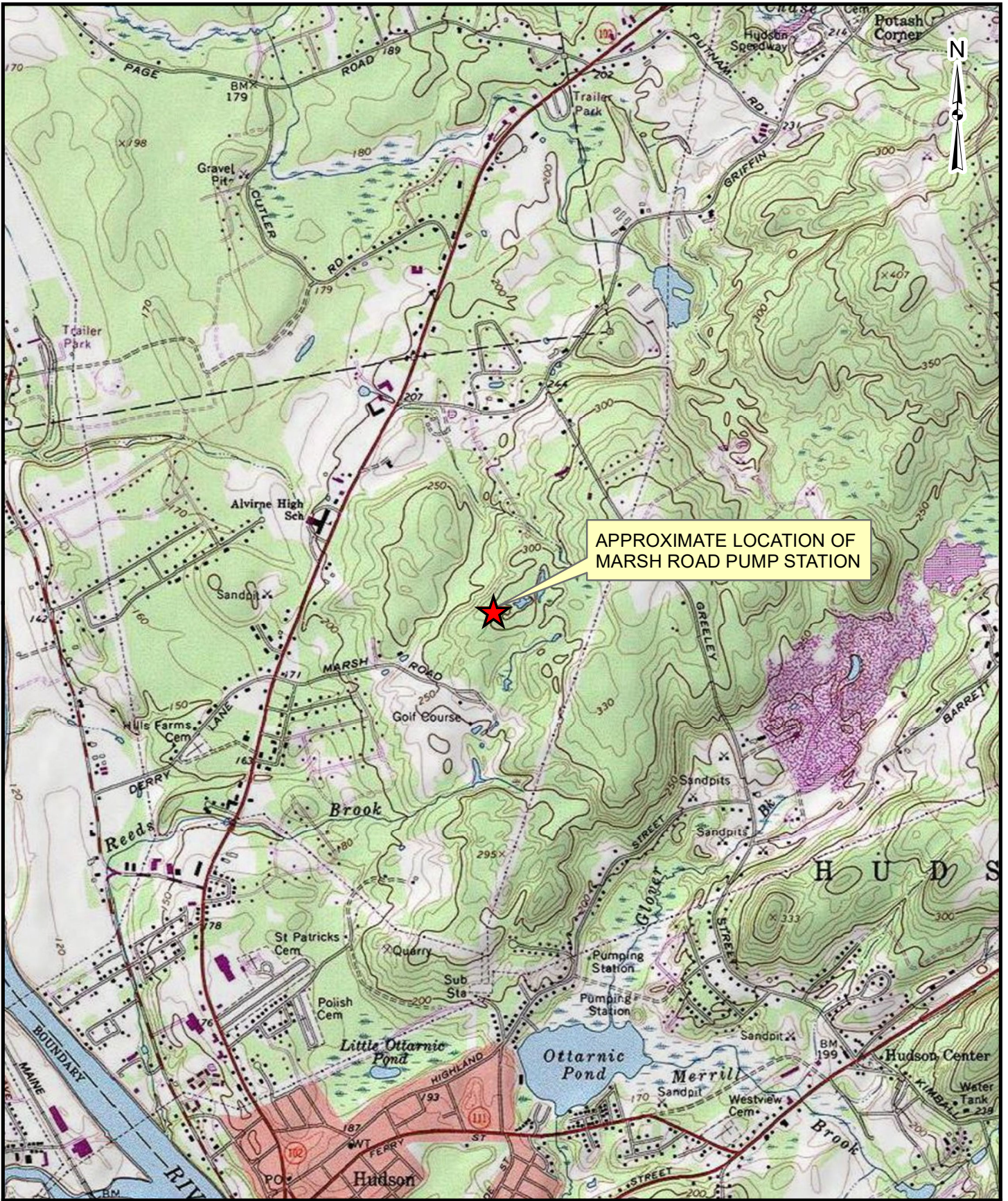
Attachment A – Boring Logs (4 pages)

Attachment B – Important Information about This Geotechnical-Engineering Report (2 pages)

SW:MJZ:TJS

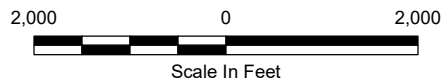
\\wse03.local\WSE\Projects\NH\Hudson, NH\Pump Stations\Marsh Rd PS\Geotechnical\Memo\Geotech Letter Report - Hudson PS_FINAL.doc

FIGURES



**FIGURE 1
PROJECT LOCUS**

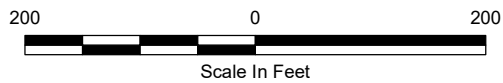
**MARSH ROAD PUMP STATION
HUDSON, NEW HAMPSHIRE**

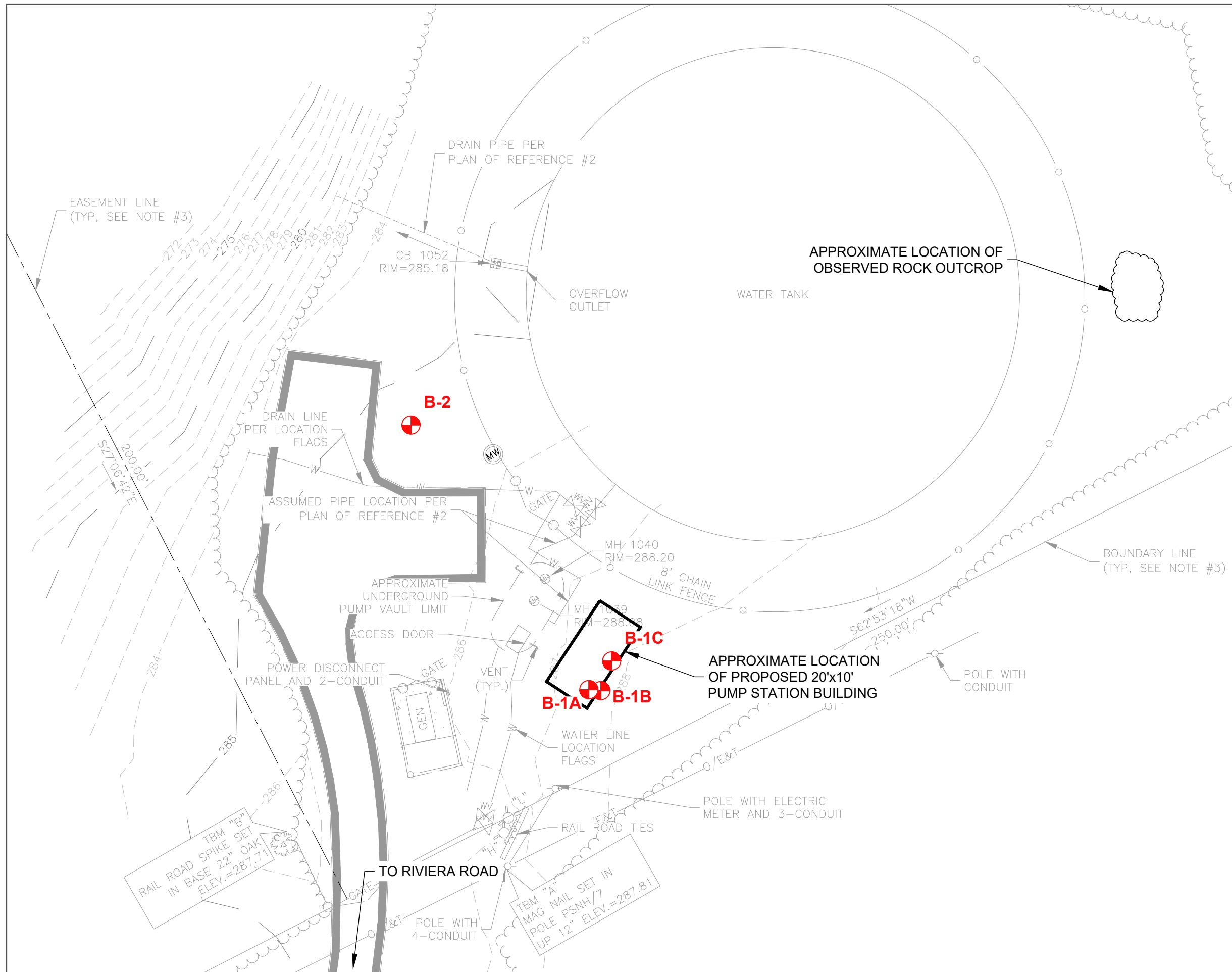




**FIGURE 2
AERIAL IMAGE**

**MARSH ROAD PUMP STATION
HUDSON, NEW HAMPSHIRE**

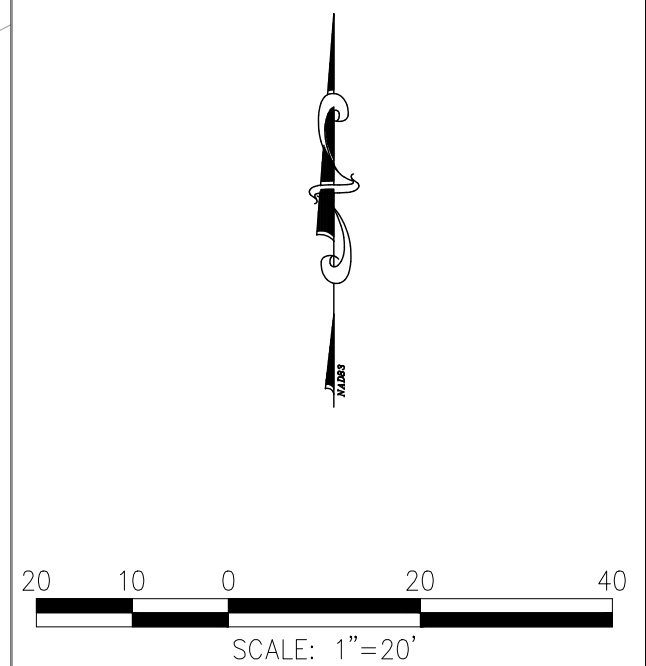




- NOTES:**
1. THIS FIGURE IS BASED ON AN EXISTING CONDITIONS SURVEY PLAN PREPARED BY SFC ENGINEERING OF WINDHAM, NEW HAMPSHIRE DATED AUGUST 24, 2021.
 2. BORINGS B-1 AND B-2 COMPLETED BY NEW ENGLAND BORING CONTRACTORS OF DERRY, NEW HAMPSHIRE ON SEPTEMBER 13, 2021 AND OBSERVED BY WESTON & SAMPSON ENGINEERS, INC.
 3. BORING LOCATIONS SHOWN ON THIS PLAN WERE LOCATED RELATIVE TO EXISTING SITE FEATURES AND ARE APPROXIMATE.
 4. ELEVATION DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

LEGEND:

B-1
 BORING DESIGNATION AND APPROXIMATE LOCATION.



**FIGURE 3
SITE PLAN**

**MARSH ROAD PUMP STATION
HUDSON, NEW HAMPSHIRE**

DESIGNED BY: MJZ	CHECKED BY: STS	OCTOBER 2021
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Weston & SampsonSM

ATTACHMENT A
Boring Logs

GUIDE TO SUBSURFACE EXPLORATION LOGS



INDEX SHEET 1 GENERAL INFORMATION

GENERAL NOTES AND USE OF LOGS

- 1.) Explorations were made by ordinary and conventional methods and with care adequate for Weston & Sampson's study and/or design purposes. The exploration logs are part of a specific report prepared by Weston & Sampson for the referenced project and client, and are an integral part of that report. Information and interpretations are subject to the explanations and limitations stated in the report. Weston & Sampson is not responsible for any interpretations, assumptions, projections, or interpolations made by others.
- 2.) Exploration logs represent general conditions observed at the point of exploration on the date(s) stated. Boundary lines separating soil and rock layers (strata) represent approximate boundaries only and are shown as solid lines where observed and dashed lines where inferred based on drilling action. Actual transitions may be gradual and changes may occur over time.
- 3.) Soil and rock descriptions are based on visual-manual examination of recovered samples, direct observation in test pits (when permissible), and laboratory testing (when conducted).
- 4.) Water level observations were made at the times and under the conditions stated. Fluctuations should be expected to vary with seasons and other factors. Use of fluids during drilling may affect water level observations. The absence of water level observations does not necessarily mean the exploration was dry or that subsurface water will not be encountered during construction.
- 5.) Standard split spoon samplers may not recover particles with any dimension larger than 1-3/8 inches. Reported gravel conditions or poor sample recovery may not reflect actual in-situ conditions.
- 6.) Sections of this guide provide a general overview of Weston & Sampson's practices and procedures for *identifying* and *describing* soil and rock. These procedures are predominantly based on ASTM D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*, the International Society of Rock Mechanics (ISRM) standards, and the *Engineering Geology Field Manual* published by the Bureau of Reclamation. Not all aspects of this guide relating to description and identification procedures of soil and rock may be applicable in all circumstances.

SAMPLER GRAPHICS

- Split Spoon (Standard)
2" OD, 1-3/8" ID
- Split Spoon (Oversize)
3" OD, 2-3/8" ID
- Shelby or Piston Tube
3" OD, 2-7/8" ID
- Double-Tube Rock Core Barrel
2" Core Diameter
- Direct Push with Acetate Liner
Various Liner Sizes
- Auger Sample
(from cuttings or hand auger)
- Grab Sample
(manual, from discrete point)
- Composite Sample
(multiple grab samples)

WELL GRAPHICS

- Cement concrete seal around casing or riser pipe
- Bentonite seal around casing or riser pipe
- Cement grout seal around casing or riser pipe
- Soil backfill around riser pipe or beneath screen
- Gravel backfill around screen or riser pipe
- Sand backfill around screen or riser pipe (filter sand)
- Solid-wall riser; Sch. 40 PVC, 1" ID unless noted otherwise
- Slotted screen; Sch. 40 PVC, 1" ID with machined slots

CAVING / SEEPAGE TERMS

The following caving and/or seepage terms may appear on a test pit log.

Caving Term	Criteria
Minor.....	less than 1 cubic ft.
Moderate.....	1 to 3 cubic ft.
Severe.....	greater than 3 cubic ft.

Seepage Term	Criteria
Slow.....	less than 1 gpm
Moderate.....	1 to 3 gpm
Fast.....	greater than 3 gpm

KEY TO WATER LEVELS

- Observed in exploration during advancement.
- Measured in exploration at completion, prior to backfilling or well installation.
- Measured in exploration after the stated stabilization period, prior to backfilling, or in well installation if noted.

DEFINITIONS OF COMMON TERMS

Sample Recovery Ratio - The length of material recovered in a drive or push type sampler over the length of sampler penetration, in inches (e.g. 18/24).

Standard Penetration Test (SPT) - An in-situ test where a standard split-spoon sampler is driven a distance of 12 or 18 inches (after an initial 6-inch seating interval) using a 140-lb. hammer falling 30 inches for each blow.

SPT Blows - The number of hammer blows required to drive a split-spoon sampler each consecutive 6-inch interval during a *Standard Penetration Test*. If no discernable advancement of a split spoon sampler is made after 50 consecutive hammer blows, 50/X indicates *sampler refusal* and is the number of blows required to drive the sampler X inches.

SPT N-Value (N) - The uncorrected blow count representation of a soil's penetration resistance over a 12-inch interval after an initial 6-in. seating interval, reported in blows per foot (bpf). The N-value is correlated to soil engineering properties.

Auger Refusal - No discernable advancement of the auger over a period of 5 minutes with full rig down pressure applied.

Casing Refusal (Driven) - Casing penetration of less than 6 inches after a minimum 50 blows of a drop hammer weighing 300 lbs. or a minimum 100 blows of a drop hammer weighing 140 lbs.

PID Measurement - A measurement (electronic reading) taken in the field using a photoionization detector (PID) to detect the presence of volatile organic compounds in a soil sample. Values are reported as benzene equivalent units in parts per million (ppm) unless noted otherwise.

Rock Quality Designation (RQD) - A qualitative index measure of the degree of jointing and fracture of a rock core taken from a borehole. The RQD is defined as the sum length of solid core pieces 4 inches or longer divided by the run (cored) length, expressed as a percentage. Higher RQD values may indicate fewer joints and fractures in the rock mass.

Fill (Made Ground) - A deposit of soil and/or artificial waste materials that has been placed or altered by human processes.

LABORATORY TESTS AND FIELD MEASUREMENTS

MC.....	Moisture Content	IC.....	1D Incremental Consolidation
OC.....	Organic Content	VS.....	Laboratory Vane Shear
PL.....	Plastic Limit	US.....	Unconfined Compression
LL.....	Liquid Limit	TC.....	Triaxial Compression
GC.....	Gravel Content	PP.....	Pocket (Hand) Penetrometer
SC.....	Sand Content	TV.....	Torvane (Hand Vane)
FC.....	Fines Content	PID.....	Photoionization Detector
DS.....	Direct Shear	FID.....	Flame Ionization Detector

BORING ADVANCEMENT METHODS

Hollow-Stem Auger Drilling - Utilizes continuous flight auger sections with hollow stems to advance the borehole. Drill rods and a plug are inserted into the auger stem to prevent the entrance of soil cuttings into the augers.

Rotary Wash Drilling - Utilizes downward pressure and rotary action applied to a non-coring bit while washing the cuttings to the surface using a circulating fluid injected down the drill rods. The borehole is supported with either steel casing or the drilling fluid. Where a casing is used, the borehole is advanced sequentially by driving the casing to the desired depth and then cleaning out the casing. The process of driving and cleaning the casing is commonly referred to as the 'drive-and-wash' technique.

Continuous Sampling - Includes a variety of methods and procedures during which the borehole is advanced via continuous recovery of soil samples. *Direct Push* sampling is a common method that uses static downward pressure combined with percussive energy to drive a steel mandrel into the ground at continuous intervals while recovering soil samples in disposable acetate liners.

Rock Coring - Utilizes downward pressure and rotary action applied to a core barrel equipped with a diamond-set or tungsten carbide coring bit. During conventional coring, the entire barrel is retrieved from the hole upon completion of a core run. Wireline coring allows for removal of the inner barrel assembly containing the actual core while the drill rods and outer barrel remain in the hole. Various types and sizes of core barrels and bits are used.

GUIDE TO SUBSURFACE EXPLORATION LOGS



INDEX SHEET 2 SOIL DESCRIPTION

SOIL CONSTITUENTS

Naturally occurring soils consist of one or more of the following matrix constituents defined in terms of particle size.

Constituent	U.S. Sieve Size	Observed Size (in.)
Gravel (Coarse)	3/4 in. - 3 in.	3/4 - 3
Gravel (Fine)	No. 4 - 3/4 in.	1/5 - 3/4
Sand (Coarse)	No. 10 - No. 40	1/16 - 1/5
Sand (Medium)	No. 40 - No. 10	1/64 - 1/16
Sand (Fine)	No. 200 - No. 40	1/300 - 1/64
Fines (Silt or Clay)	Smaller than No. 200	Less than 1/300

SOIL IDENTIFICATION

Soil identification refers to the grouping of soils with similar physical characteristics into a category defined by a **group name** and corresponding **group symbol** based on estimation of the matrix soil constituents to the nearest 5% and simple manual tests. Proportions of cobbles, boulders, and other non-matrix soil materials are not considered during this procedure but are included in the overall soil description if observed or thought to be present. Refer to the following descriptions and tables adapted from ASTM D2488.

Coarse-Grained Soil - Coarse-grained soils contain fewer than 50% fines and are identified based on the following table.

Primary Constituent	Fines Percent	Type of Fines and Gradation	Group Symbol	Group Name ⁽¹⁾
GRAVEL	≤ 5%	well graded	GW	Well graded gravel
		poorly graded	GP	Poorly graded gravel
	10%	clayey well graded fines	GW-GC	Well graded gravel with clay fines
		poorly graded silty well graded fines	GP-GC	Poorly graded gravel with clay fines
15% to 45%	clayey	GC	Clayey gravel	
	silty	GM	Silty gravel	
SAND	≤ 5%	well graded	SW	Well graded sand
		poorly graded	SP	Poorly graded sand
	10%	clayey well graded fines	SW-SC	Well graded sand with clay fines
		poorly graded silty well graded fines	SP-SC	Poorly graded sand with clay fines
	15% to 45%	clayey	SC	Clayey sand
		silty	SM	Silty sand
	15% to 45%	clayey well graded	SW-SM	Well graded sand with silt
		poorly graded silty well graded	SP-SM	Poorly graded sand with silt
	15% to 45%	clayey	SC	Clayey sand
		silty	SM	Silty sand

⁽¹⁾ If soil is a gravel and contains 15% or more sand, add "with sand" to the group name. If soil is a sand and contains 15% of more gravel, add "with gravel" to the group name.

Inorganic Fine-Grained Soil - Fine-grained soils contain 50% or more fines and are identified based on the following table.

Plasticity Criteria	Dry Strength	Coarse Fraction S = Sand, G = Gravel	Group Symbol	Group Name ⁽¹⁾
Medium	Medium to high	< 15% S + G	CL	Lean clay
		≥ 30% % S ≥ % G	CL	Sandy lean clay
		S + G % S < % G	CL	Gravelly lean clay
Non-plastic	None to low	< 15% S + G	ML	Silt
		≥ 30% % S ≥ % G	ML	Sandy silt
		S + G % S < % G	ML	Gravelly silt
High	High to very high	< 15% S + G	CH	Fat clay
		≥ 30% % S ≥ % G	CH	Sandy fat clay
		S + G % S < % G	CH	Gravelly fat clay
Low to Medium	Low to medium	< 15% S + G	MH	Elastic silt
		≥ 30% % S ≥ % G	MH	Sandy elastic silt
		S + G % S < % G	MH	Gravelly elastic silt

⁽¹⁾ If soil contains 15% to 25% sand or gravel, add "with sand" or "with gravel" to the group name.

Organic Fine-Grained Soil - Fine-grained soils that contain enough organic particles to influence the soil properties are identified as Organic Soil and assigned the group symbol **OL** or **OH**.

Highly Organic Soil (Peat) - Soils composed primarily of plant remains in various stages of decomposition are identified as Peat and given the group symbol **PT**. Peat usually has an organic odor, a dark brown to black color, and a texture ranging from fibrous (original plant structure intact or mostly intact) to amorphous (plant structure decomposed to fine particles).

SOIL DESCRIPTION

Soils are described in the following general sequence. Deviations may occur in some instances.

Identification Components

(1) Group Name and Group Symbol

Description Components

- (2) Consistency (Fine-Grained) or Apparent Density (Coarse-Grained)
- (3) Color (*note, the term "to" may be used to indicate a gradational change*)
- (4) Soil Moisture
- (5) Matrix Soil Constituents (Gravel, Sand, Fines)
 - ↳ Proportion (*by weight*), particle size, plasticity of fines, angularity, etc.
- (6) Non-Matrix Soil Materials and Proportions (*by volume*)
- (7) Other Descriptive Information (Unusual Odor, Structure, Texture, etc.)
- (8) [Geologic Formation Name or Soil Survey Unit]

SPT N-VALUE CORRELATIONS

Consistency	SPT N-Value	Apparent Density	SPT N-Value
Very soft	0 - 2	Very loose	0 - 5
Soft	2 - 4	Loose	5 - 10
Medium stiff	4 - 8	Medium dense	10 - 30
Stiff	8 - 15	Dense	30 - 50
Very stiff	15 - 30	Very dense	> 50
Hard	> 30		

SOIL MOISTURE

Dry..... Apparent absence of moisture; dry to the touch.
Moist..... Damp but no visible water.
Wet..... Visible free water; saturated.

PROPORTIONS / PERCENTAGES

Proportions of gravel, sand, and fines (excluding cobbles, boulders, and other constituents) are stated in the following terms indicating a range of percentages by weight (to nearest 5%) of the minus 3-in. soil fraction and add up to 100%.

Proportions of cobbles, boulders, and other non-matrix soil materials including artificial debris, roots, plant fibers, etc. are stated in the following terms indicating a range of percentages by volume (to the nearest 5%) of the total soil.

Mostly 50% - 100%	Numerous 40% - 50%
Some 30% - 45%	Common 25% - 35%
Little 15% - 25%	Occasional 10% - 20%
Few 5% - 10%	Trace Less than 5%
Trace Less than 5%	

PLASTICITY (FINES ONLY)

Non-plastic..... Dry specimen ball falls apart easily. Cannot be rolled into thread at any moisture content.
Low..... Dry specimen ball easily crushed with fingers. Can be rolled into 1/8-in. thread with some difficulty.
Medium..... Difficult to crush dry specimen ball with fingers. Easily rolled into 1/8-in. thread.
High..... Cannot crush dry specimen ball with fingers. Easily rolled and re-rolled into 1/8-in. thread.

COBBLES AND BOULDERS

Cobbles - Particles of rock that will pass a 12-in. square opening and be retained on a 3-in. sieve.
Boulders - Particles of rock that will not pass a 12-in. square opening.

Note: Where the percentage (by volume) of cobbles and/or boulders cannot be accurately or reliably estimated, the terms "with cobbles", "with boulders", or "with cobbles and boulders" may be used to indicate observed or inferred presence.

GUIDE TO SUBSURFACE EXPLORATION LOGS



INDEX SHEET 3 ROCK DESCRIPTION

ROCK DEFINITION

Where reported on an exploration log, *rock* is defined as any naturally formed aggregate of mineral matter occurring in larges masses or fragments. This definition of rock should not be taken as a replacement for any definitions relating to rock and/or rock excavation defined in construction documents. Intensely weathered or decomposed rock that is friable and can be reduced to gravel size particles or smaller by normal hand pressure is identified and described as soil. Poorly indurated formational materials which display both rock-like and soil-like properties are identified and described as rock followed by the soil description. In such cases, the term "poorly indurated" or "weakly cemented" is added to the rock name (e.g. weakly cemented sandstone).

ROCK IDENTIFICATION

Rock is identified by a combination of *rock type* (igneous, metamorphic, or sedimentary) followed by the the *rock name* (e.g. granite, schist, sandstone).

ROCK DESCRIPTION

Rock descriptions are presented in the following general sequence. The detail of description is dictated by the complexity and objectives of the project.

Identification Components

(1) Rock Type and Name

Description Components

- (2) Rock Grain Size (*for clastic sedimentary rock*)
- (3) Crystal Size (*for igneous and metamorphic rock*)
- (4) Bedding Spacing (*for sedimentary rock*)
- (5) Color
- (6) Hardness and Weathering Descriptors
- (7) Fracture Density
- (8) [Geologic Formation Name]

ROCK QUALITY DESIGNATION

$$RQD (\%) = \frac{\sum \text{Length of intact core pieces} \geq 4 \text{ inches}}{\text{Total length of core run (inches)}} \times 100$$

The RQD should correlate with the fracture density in most cases. Higher RDQ values generally indicate fewer joints and fractures.

GRAIN / CRYSTAL SIZE

Grain Size for Clastic Sedimentary Rock

The names of clastic sedimentary rocks are generally based on their predominant clast or grain size (e.g. fine sandstone, medium sandstone, coarse gravel conglomerate, cobble conglomerate, siltstone, claystone).

Crystal Size for Igneous and Metamorphic Rock

Grain Size Description	Average Crystal Size (in.)
Very coarse grained (pegmatitic)	Greater than or equal to 3/8
Coarse-grained	Between 3/16 and 3/8
Medium-grained	Between 1/32 and 3/16
Fine-grained	Between 1/250 and 1/32
Aphanitic	Less than or equal to 1/250

BEDDING SPACING

Bedding Description	Thickness / Spacing
Massive	Less than 10 ft.
Very thickly bedded	3 ft. to 10 ft.
Thickly bedded	1 ft. to 3 ft.
Moderately bedded	4 in. to 1 ft.
Thinly bedded	1 in. to 4 in.
Very thinly bedded	1/4 in. to 1 in.
Laminated	Less than 1/4 in.

Note: Bedding is generally only applicable to sedimentary or bedded volcanic rocks.

HARDNESS

Hardness	Criteria
Extremely hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very hard	Cannot be scratched with a pocketknife or sharp pick with difficulty. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with with a pocketknife or sharp pick with difficulty. Breaks with heavy hammer blows.
Moderately hard	Can be scratched with a pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily with a pocketknife or sharp pick. Breaks with light to moderate manual pressure.
Very soft	Can be readily indented, grooved, or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

WEATHERING (INTACT ROCK)

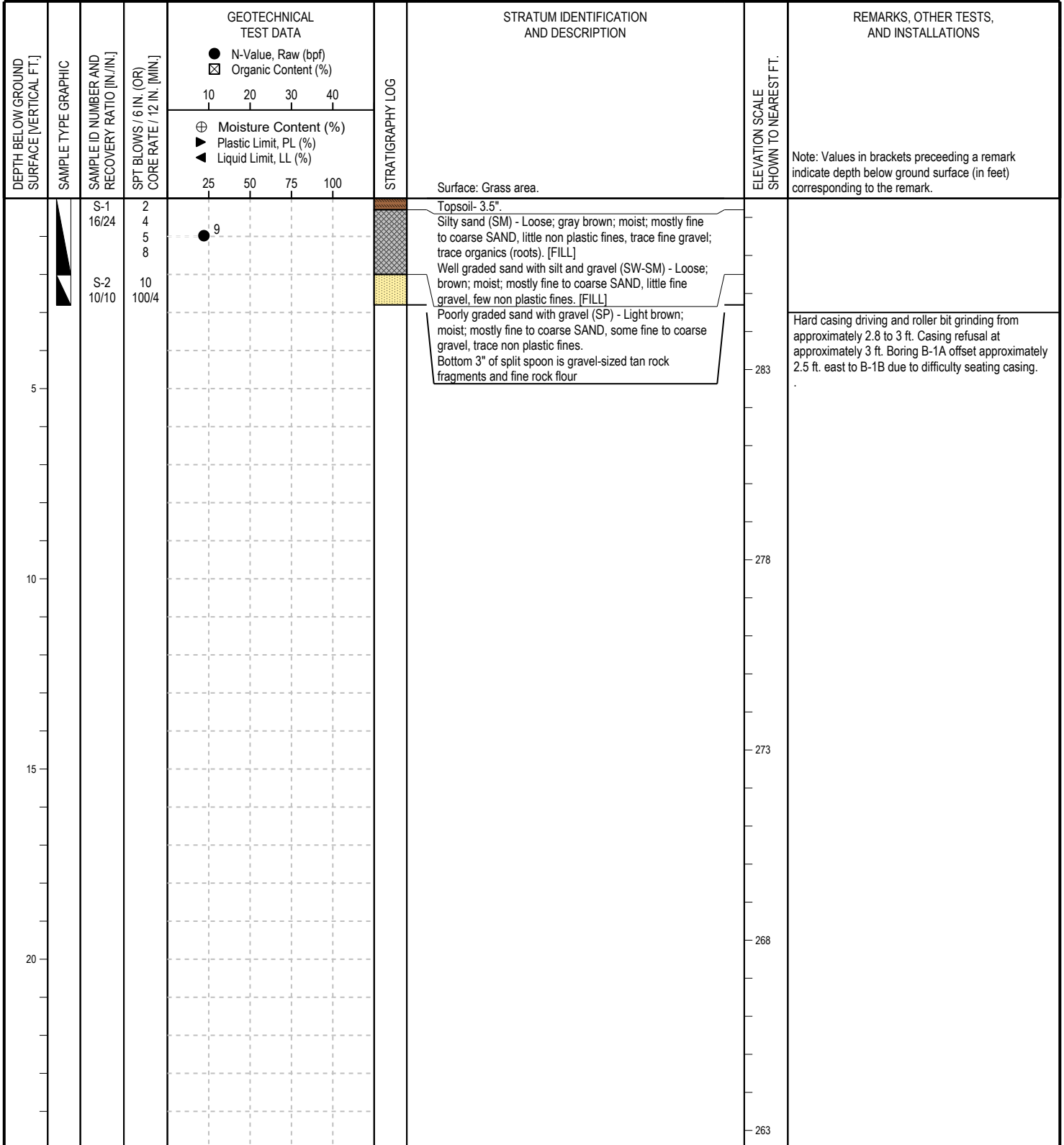
Weathering Description	Discoloration and/or Oxidation	General Characteristics
Fresh	Body of rock and fracture surfaces are not discolored or oxidized.	Rock texture unchanged. Hammer rings when crystalline rocks are struck.
Slightly weathered	Discoloration or oxidation limited to surface of, or short distance from, fractures. Most surfaces exhibit minor to complete discoloration.	Rock texture preserved. Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately weathered	Discoloration or oxidation extends usually throughout. Fe-Mg minerals appear rusty. All fracture surfaces are discolored or oxidized.	Rock texture generally preserved. Hammer does not ring when rock is struck. Body of rock slightly weakened.
Intensely weathered	Discoloration or oxidation throughout. Feldspar and Fe-Mg minerals altered to clay to some extent. All fracture surfaces are discolored or oxidized and friable.	Rock texture altered by chemical disintegration. Can usually be broken with moderate to heavy manual pressure or by light hammer blow . Body of rock is significantly weakened.
Decomposed	Discoloration or oxidation throughout but resistant minerals such as quartz may be unaltered. All feldspar and Fe-Mg minerals are completely altered to clay.	Resembles a soil; partial or complete remnant rock structure may be preserved. Can be granulated by hand. Resistant minerals may present as stringers or dikes.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures
Very slightly fractured	Core lengths greater than 3 ft.
Slightly fractured	Core lengths mostly from 1 ft. to 3 ft.
Moderately fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely fractured	Core lengths mostly from 1 in. to 4 in.
Very intensely fractured	Mostly chips and fragments

Note: Fracture density is based on the fracture spacing in recovered core, measured along the core axis (excluding mechanical breaks).

CONTRACTOR:	NE Boring Contractors, Inc.	BORING LOCATION:	See site plan.	DATE START:	September 13, 2021
FOREMAN:	G. Peacock	ADVANCE METHOD:	Rotary Wash Drilling	DATE FINISH:	September 13, 2021
LOGGED BY:	M. Zanchi, PE	AUGER DIAMETER:	N/A	GROUND EL:	287.5 ± (NAVD88)
CHECKED BY:	T. Strike, PE	SUPPORT CASING:	Driven Flush-Joint Casing (4" ID)	FINAL DEPTH:	3.0 ft.
EQUIPMENT:	Truck Mounted Drill Rig	CORING METHOD:	N/A	GRID COORDS:	N:105838 ± / E:1047991 ±
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings	GRID SYSTEM:	NAD83 State Plan (NH)



Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

CONTRACTOR:	NE Boring Contractors, Inc.	BORING LOCATION:	See site plan.	DATE START:	September 13, 2021
FOREMAN:	G. Peacock	ADVANCE METHOD:	Rotary Wash Drilling	DATE FINISH:	September 13, 2021
LOGGED BY:	M. Zanchi, PE	AUGER DIAMETER:	N/A	GROUND EL:	287.7 ± (NAVD88)
CHECKED BY:	T. Strike, PE	SUPPORT CASING:	Driven Flush-Joint Casing (4" ID)	FINAL DEPTH:	4.0 ft.
EQUIPMENT:	Truck Mounted Drill Rig	CORING METHOD:	N/A	GRID COORDS:	N:105838 ± / E:1047994 ±
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings	GRID SYSTEM:	NAD83 State Plan (NH)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA				STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
				● N-Value, Raw (bpf)	☒ Organic Content (%)	⊕ Moisture Content (%)	▶ Plastic Limit, PL (%)				
				10	20	30	40		Surface: Grass area.		
				25	50	75	100		Refer to boring log for B-1A for sample descriptions from 0 to 3 ft. B-1B is offset approximately 2.5 ft. east of B-1A.		
5										283	Possible boulder or bedrock encountered at approximately 3.5 ft. Spin casing and roller bit advanced to approximately 4 ft. Boring B-1B offset approximately 6.5 ft. north to B-1C due to difficulty seating casing.
10										278	
15										273	
20										268	
										263	

CONTRACTOR:	NE Boring Contractors, Inc.	BORING LOCATION:	See site plan.	DATE START:	September 13, 2021
FOREMAN:	G. Peacock	ADVANCE METHOD:	Rotary Wash Drilling	DATE FINISH:	September 13, 2021
LOGGED BY:	M. Zanchi, PE	AUGER DIAMETER:	N/A	GROUND EL:	287.8 ± (NAVD88)
CHECKED BY:	T. Strike, PE	SUPPORT CASING:	Driven Flush-Joint Casing (4" ID)	FINAL DEPTH:	9.5 ft.
EQUIPMENT:	Truck Mounted Drill Rig	CORING METHOD:	NX Conventional	GRID COORDS:	N:105844 ± / E:1047996 ±
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings	GRID SYSTEM:	NAD83 State Plan (NH)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]	GEOTECHNICAL TEST DATA				STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
				● N-Value, Raw (bpf)	☒ Organic Content (%)	⊕ Moisture Content (%)	▶ Plastic Limit, PL (%)				
				10	20	30	40		Surface: Grass area.		Note: Values in brackets preceding a remark indicate depth below ground surface (in feet) corresponding to the remark.
5		S-3 4/6 C-1 57/60	100 04:18 08:12 04:30 04:28 05:30						Refer to boring logs for B-1A and B-1B for sample descriptions from 0 to 3 ft. B-1C is offset approximately 6.5 ft. north of B-1B.		
									Poorly graded gravel with silt and sand (GP-GM) - Light brown; moist; mostly fine to coarse GRAVEL, some fine to coarse sand, few non plastic fines.	283	Drill through possible cobble from approximately 3 to 3.8 ft.
									Hard, slightly weathered, gray, medium to coarse-grained, GRANITE, horizontal to low angle joints, close to moderate spacing, slight iron staining and weathering of joint surfaces. [TWO-MICA GRANITE OF SOUTHEASTERN NH] RQD: 77%		Rollerbit grinding on possible top of bedrock at approximately 4.5 ft. Core rock from approximately 4.5 to 9.5 ft.
10										278	
15										273	
20										268	
										263	

ATTACHMENT B
Important Information about This
Geotechnical-Engineering Report

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

conspicuously that you’ve included the material for information purposes only. To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* **Confront the risk of moisture infiltration** by including building-envelope or mold specialists on the design team. **Geotechnical engineers are not building-envelope or mold specialists.**

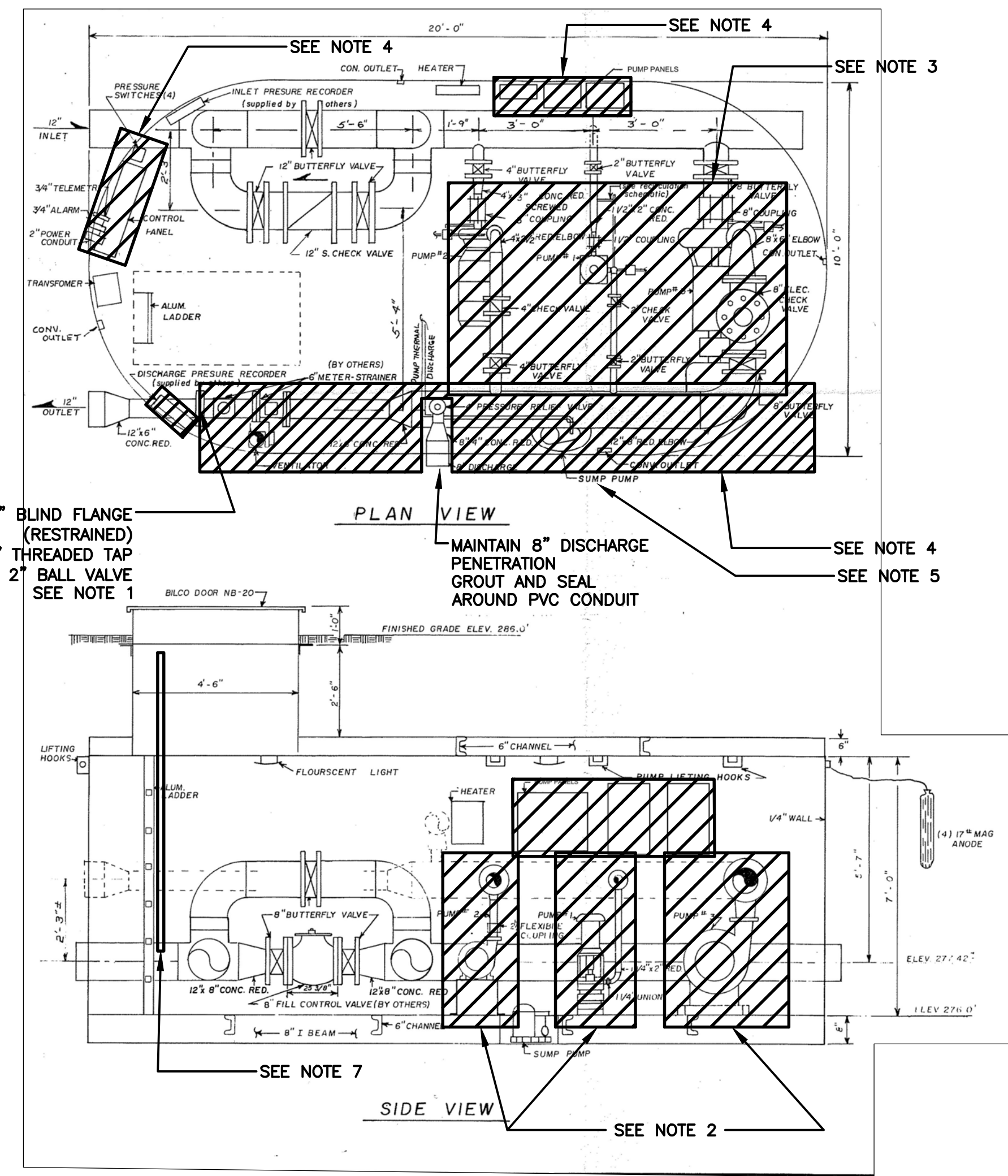


Telephone: 301/565-2733

e-mail: info@geoprofessional.org www.geoprofessional.org

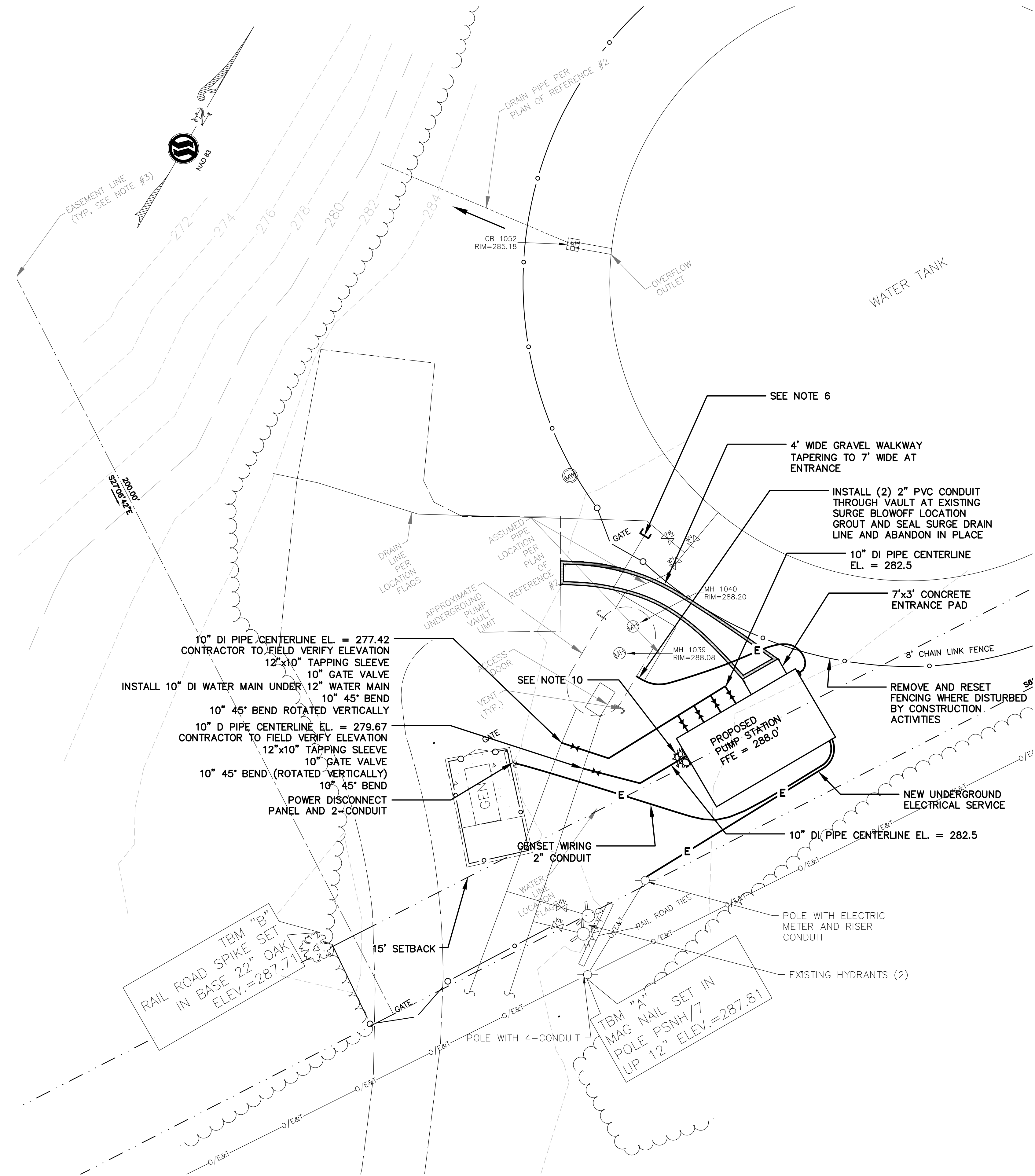
DRAWING INDEX

SHEET	TITLE
C001	MARSH ROAD PUMP STATION - DEMOLITION & SITE PLAN
M001	MARSH ROAD PUMP STATION - PROCESS PLAN
M002	MARSH ROAD PUMP STATION - ELEVATION VIEWS
S001	GENERAL NOTES 1
S101	FOUNDATION PLAN
E600	ELECTRICAL ONE LINE




MECHANICAL DEMO PLAN
SCALE: N.T.S.

- NOTES:**
- ALL DEMOLITION WORK TO BE CONDUCTED UPON FINAL COMPLETION OF PUMP STATION CONSTRUCTION. FINAL COMPLETION SHALL INCLUDE ACCEPTANCE OF REQUIRED START-UP TESTING, ACCEPTABLE OPERATION OF PUMP STATION FOR FOUR WEEK PERIOD, AND APPROVAL FROM THE OWNER AND ENGINEER. INSTALLATION OF 6" BLIND FLANGE TO BE CONDUCTED DURING NIGHTTIME SHUTDOWN WHICH CONTRACTOR SHALL COORDINATE WITH OWNER AND ENGINEER.
 - REMOVE AND DISPOSE OF EXISTING DOMESTIC SERVICE BOOSTER PUMPS, FIRE PUMP AND ASSOCIATED PIPING.
 - CLOSE ISOLATION VALVES ON PUMP SUCTION BRANCHES AND FURNISH AND INSTALL BLIND FLANGE CONNECTIONS.
 - REMOVE AND DISPOSE EXISTING DISCHARGE HEADER PIPING, PUMP STARTERS, PUMP CONTROL PANEL, DISCHARGE PRESSURE RECORDER, SUCTION PRESSURE INDICATOR. MAINTAIN EXISTING STATION INTRUSION AND TEMPERATURE ALARMS, ENVIRONMENT CONTROL/THERMOSTAT, DEHUMIDIFIER, UNIT HEATER, LIGHTING, AND TANK LEVEL TELEMTRY.
 - CONTRACTOR TO INVESTIGATE LOCATION OF SUMP PUMP DISCHARGE THROUGH THE USE OF DYE WATER OR OTHER WATER TRACING METHODOLOGY.
 - INSTALL 6" MJ CAP ON EXISTING DRAIN LINE AND ABANDON IN PLACE. BRICK AND BLOCK SEAL SURGE RELIEF DRAIN LINE.
 - CONTRACTOR TO INSTALL LADDER-UP SAFETY POST WITHIN EXISTING UNDERGROUND STATION. SAFETY POST SHALL BE INSTALLED ON THE VERTICAL CENTERLINE OF THE FIXED LADDER BELOW THE MANHOLE COVER. LADDER-UP SAFETY POST SHALL BE MODEL LU-1 AS MANUFACTURED BY THE BILCO COMPANY, OR APPROVED EQUAL.
 - ALL PROPOSED WATER MAIN SHALL BE ZINC COATED, POLYETHYLENE ENCASED, CLASS 52 DUCTILE IRON WATER MAIN.
 - CONDUIT TO BE SCHEDULE 80 PVC.
 - CONTRACTOR TO PROVIDE 2 CUBIC YARDS OF RIP RAP FOR SURGE RELIEF BLOW OFF TO PREVENT GROUND SCOUR.
 - ALL CONSTRUCTION SHALL MEET TOWN OF HUDSON, NH WATER UTILITY AND ENGINEERING CONSTRUCTION SPECIFICATION.



PUMP STATION SITE PLAN
SCALE: 1:10

Project:
TOWN OF HUDSON, NH



MARSH ROAD PUMP STATION
DESIGN

2 CONSTITUTION DR
HUDSON, NH 03051

Weston & Sampson
Engineers, Inc.

100 International Drive, Suite 152
Portsmouth, NH 03801
978.532.1900 800.SAMPSON
www.westonandsampson.com

Consultants:

Revisions:

No.	Date	Description

Seal:

COA:
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Issued For:

DRAFT DOCUMENTS

Scale: AS NOTED

Date: 2/18/2022

Drawn By: JTR

Reviewed By: SHK

Approved By: JWM

W&S Project No.: ENG21-0801

W&S File No.: 247-100

Drawing Title:

**MARSH ROAD PUMP
STATION -
DEMOLITION & SITE
PLAN**

Sheet Number:

C001

QUESTIONS AND ANSWERS RELATED TO PHASE 1 & 2 OF THIS PROJECT

DESIGN/BUILD SERVICES FOR MARSH ROAD WATER PUMP STATION TOWN OF HUDSON, NEW HAMPSHIRE

Below is a list of questions and answers from Phase 1 of this project. It shall be the responsibility of the Contractor to be aware of this amendment and providing this document with the bid documents.

Question 1: On page 96 Section 1.05 Design Criteria, D. The exterior walls shall be finished with an exposed aggregate finish with a cantilever strip extension at the base and roofline. Page 100 Section 2.10 Finishes The exterior surface of the building body shall be of an architectural concrete finish. Question: Just want to confirm the exterior UCP has a smooth stucco finish that can be painted any color?

Answer 1: Smooth stucco finish that can be painted any color pre-approved by Town Engineer.

Question 2: Page 100 Section 2.10 Finishes: The floor shall be coated with Sherwin-Williams Armorseal Rextane I floor coating with Sharksgrip additive for nonslip profile, Tnemec Series 201/208 Epoxy Flooring System with sand broadcast, or approved equal. Under Section 3.2 Installation: G. Interior Floor finish painting shall be by the Contractor in the field. Paint color to be selected by Engineer. Question: UCP uses Sikaguard 62 Floor sealer with sand broadcast that can be done in our shop is this acceptable?

Answer 2: Yes, it is

Question 3: Will all the piping and pumps be installed in the field by a site contractor?

Answer 3: Yes.

Question 4: Drawing M002 shows three hatches 3' x 3'. Is there a spec on what you would like to use?

Answer 4: This is a design built so the spec will need to be submitted prior to approval of the building. This could be part of the building spec submittal.

Question 5: For this subject project, would Trillium (Wemco) be an accepted manufacturer for the vertical turbine pumps?

Answer 5: No, the contract shall stick with the specifications on the RFP.

Question 6: Is there additional electrical information about the generator hook up?

Answer 5: Yes and will be part of this document.

Question 7: Who will be responsible for notifications regarding shut offs or disruption of service?

Answer 7: The contractor shall be responsible for the notifications, if necessary. The Town will assist with providing addresses for adjacent properties to this project.

Question 8: Will work during the weekends be allowed?

Answer 8: Yes, with Engineering Departments written approval.

Question 9: We do not see an operational description or "Order of Operations" with the bid documents. We are concerned that the operation of the station may necessitate more than one of the pumps to run simultaneously. The feeder for the Pump Control Panel is shown at 200A, which will not be sufficient depending on the operational logic. Can you please clarify how the station operates ?

Answer 9: The system description and functional descriptions are included on the RFP document, see page SDFD. The contractor shall be responsible for the proper 100 % design, including panel size, for the proposed functions and intended design of the station.

Question 10: Related to the above question, without an operational description, we cannot generate a complete bill of material for the Pump Control Panel.?

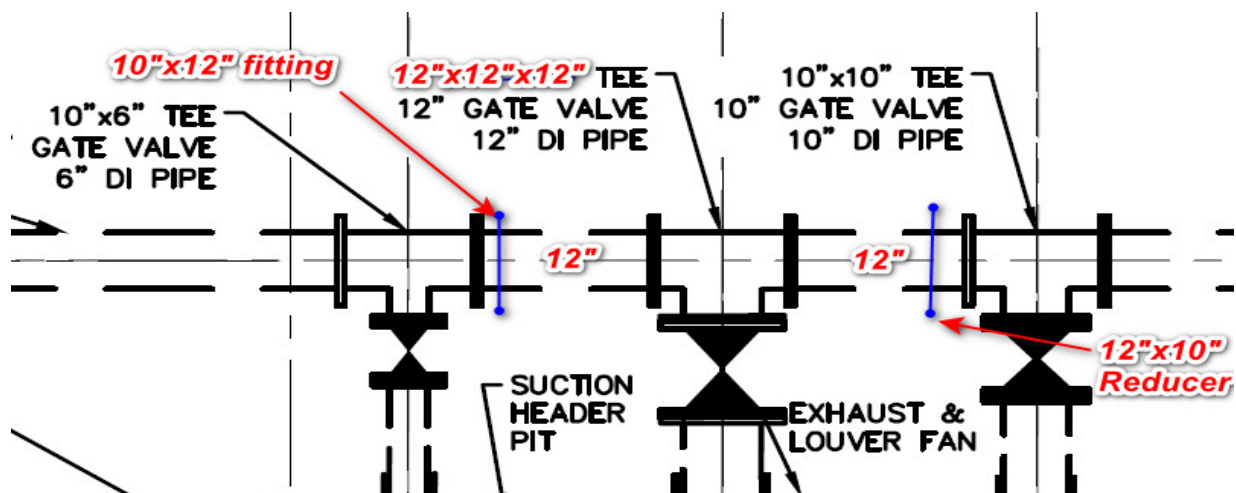
Answer 10: This is a design built project, which will require the design to be 100% completed by the contractor. Once that has been completed, the contractor can spec the parts they need and the cost associated with those parts for this design built project.

Question 11: Will new instruments/control devices be installed by your SCADA/Instrumentation provider to allow the new wiring to be completed while the existing systems remain operational? If so, will they be installing and/or furnishing these items?

Answer 11: This is a design built project, which will require the contractor to set up a design and construction contract with the SCADA consultant regarding the design and construction portion of this project. The contractor and the SCADA contractor will need to have an agreement between the two parties regarding who will be responsible for what regarding cost related to design and construction phase.

Question 12: Drawing shows a 10" main pipeline with a 12" tee fitting to 100 H.P. pump. This will require a 10" X 10" X 12" M J tee fitting. I was told this fitting is not available, should you change the drawing?

Answer 12: Contractor shall be responsible for obtaining all the parts called for. In case they can't contractor could increase the size of the size of the section in front of the 100 HP to 12 " main to accommodate a 12x12x12 MJ Fitting, see below



Question 13: If the town is going to ordinate with utility and supply the covers for the overhead wires.

Answer 13: No , that's responsibility of the contractor

Question 14: Is this a prevailing wage job?

Answer 14: No

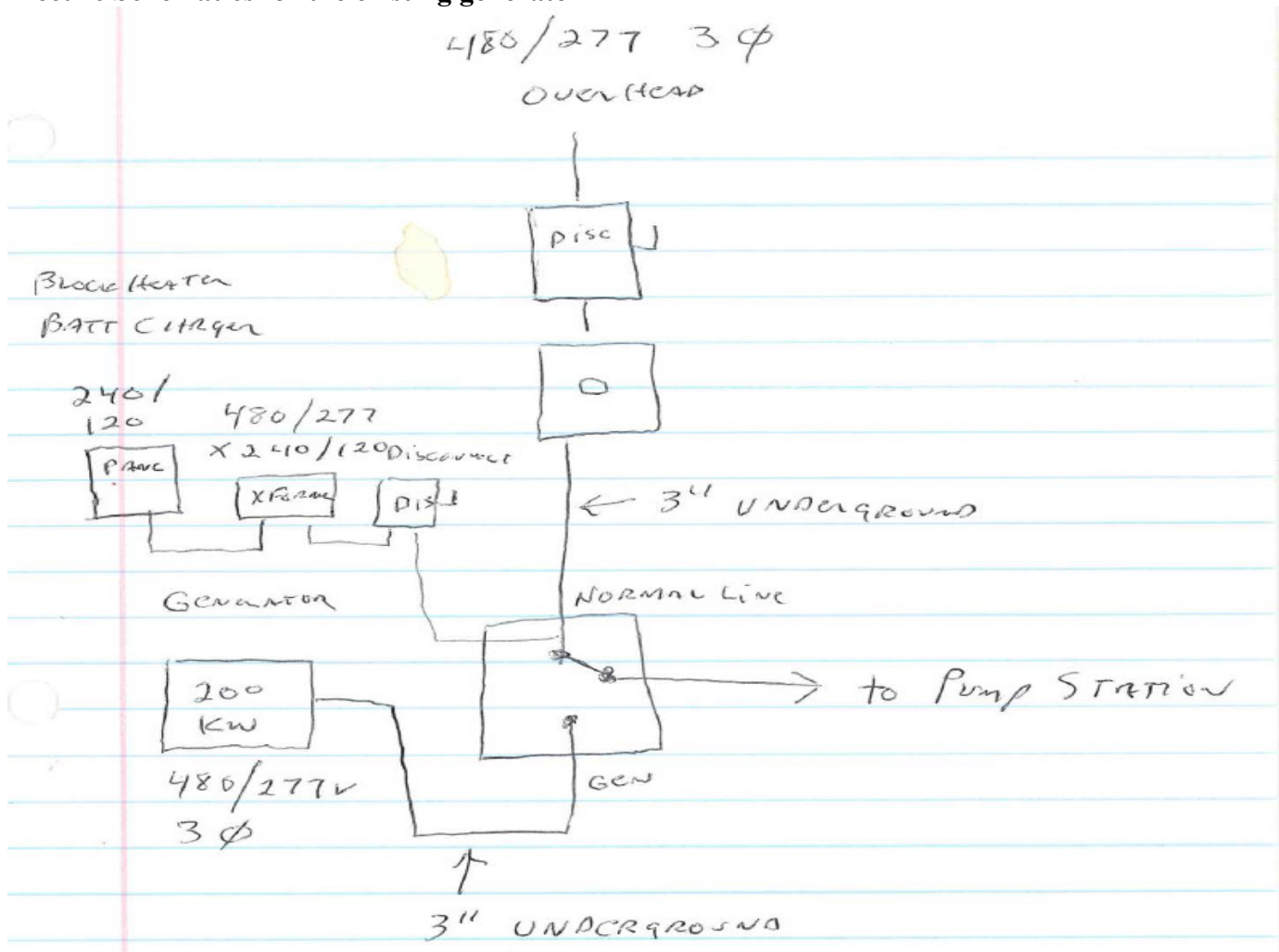
Question 15: Location of the pressure transmitter ½" corporation cock in existing piping?

Answer 15: This is a design built project and the contractor shall be responsible for determine the location

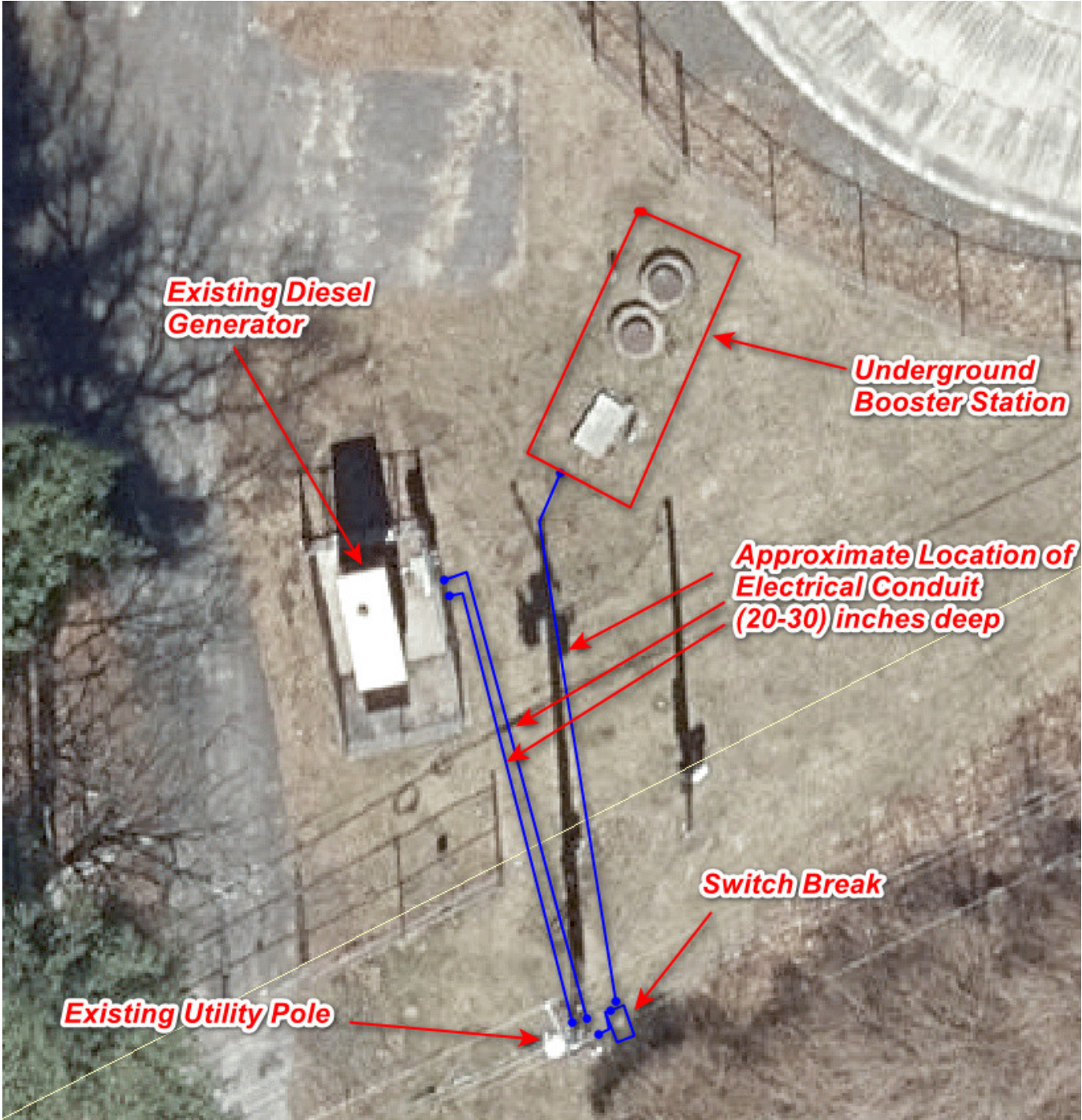
Question 16: Can you provide us with some verification where the gas line is located?

Answer 15: The generator is diesel powered and there is no gas service in the pump station. We don't Believe there is gas service in this work area but the contractor shall conduct a dig safe to determine all utilities in the area of work.

Electric Schematics for the existing generator



Approximately conduit layout locations related to the existing generator



Below is a list of questions and answers from **Phase 2** of this project. It shall be the responsibility of the Contractor to be aware of this amendment and providing this document with the bid documents.

Question 1: Please provide cut sheets for the pumps, motors, canisters, and VFDs that have already been purchased.

Answer 1: Shop Drawings have been provided on the Town website

Question 2: Please elaborate on the bullet, “The proposed work will include all water piping installation within 5 feet of the building.” For example, are Tap & Sleeves, Piping, and valve headers included in the scope of this contract. See image below from Drawing C001:

Answer 2: Water pipe work will only include only the pipe within 5 feet from the building foundation. No tap and sleeve will be required for this phase of the project.

Question 3: Based off of our preliminary estimates, our proposal for this project is expected to exceed the approximated budget of \$400,000. Is this budget flexible, or are there additional funds available?

Answer 3: All bids will be evaluated, even if they are over the budget.

Question 4: What are the Work Hours?

Answer 4: 7 AM- 7 PM , Monday – Saturday

Question 5: We are going to provide a new Electrical service from the Utility Pole to the new building in this phase or just stop the conduit 5’ short of the building and Phase 2 will complete the service?

Answer 5: The contractor is required to provide all piping from the proposed building to five feet outside the building. You are not required to go to the pole and you are also not required to install a new service on this phase of the project.

Question 6: We are just installing the conduits from the generator to 5’ short of the building.

Answer 6: The contractor is required to provide all piping from the proposed building to five feet outside the building. You do not need to install conduit all the way to the generator, that task will be on the next phase.

Question 7: It calls for (2) 2" pvc conduits from the building to the Vault , is this electrical or Mechanical conduits and are these getting installed this phase?

Answer 7: The 2 -2" conduits are for electrical and SCADA (coms), from the existing vault to the new building. The coms will not be required on this phase. The second 2" conduit can be used for the temporary electrical supply for heating the new building.

Question 8: Is the new building and foundation part of Phase 1 or Phase 2, I assume Phase 1 and we would need to install our grounding?

Answer 8: Phase 1 was the purchase of the motors, pumps, canisters and VFDs, which is complete. Phase 2 is the installation of the building with all the components provided by the town (as listed above) and all the piping within the building plus five feet out (from the building to 5 feet out, not the other way around). Phase 3 will consist of connecting all the water pipes, electrical services, coms, programing execution, connected to the generator, turnkey ready . Contractor shall decide if grounding will be included on their proposal , or not,

Question 9: How far is the existing building to the new building for the temporary heating circuit, and do you know what size heater and voltage the heater will be so I can size the circuit correctly?

Answer 9: The proposed building is approximately 15 feet away from the existing vault, please see plans for additional details. It will be up to the contractor to determine the size of the heater, which could be temporary, to keep the building above freezing conditions.

Signed: _____
I DO understand the above and agree to meet specifications

Signed: _____
I DO NOT meet specifications as listed in this amendment

Failure to submit this amendment form with your RFP response may result in your Proposal being rejected as unresponsive.

Company: _____

Signed by: _____

Printed or typed name: _____

Address: _____

Telephone number: _____ fax number: _____

Toll free number: _____ e-mail: _____

Cell phone number: _____

Primary point of contact: _____

Payment terms and conditions: _____

Please fill out, sign and return to:

Town of Hudson
Town Clerk's Office
12 School Street, Hudson, NH 03051
603-886-6003;
cstrout-lizotte@hudsonnh.gov

Due Date/Time: April 26, 2024 Not Later Than 10:00 AM

