Request for Proposal

Kindergarten Modular Classroom Addition to the Early Childhood Center

115 Phillips Brook Road

North Andover, Massachusetts

Awarding Authority
Town of North Andover
School Building Committee
120 Main Street
North Andover, MA 01845

KBA ARCHITECTS
Knight, Bagge & Anderson, Inc.
6 Thirteenth Street
Charlestown, Massachusetts 02129
617-241-2807

Owner's Project Manager
NV5
44 Pleasant Street
Watertown, MA 02472
617-744-3126

November 1, 2017

S123917

Early Childhood Center Modular Addition, North Andover, MA
MGL c149.s44E(4),

The North Andover School Building Committee, on behalf of Town of North Andover, seeks proposals from qualified Contractors for the transport, site work, utility connections, foundation, miscellaneous modifications to the site, provision, assembly and installation of modular units to the existing Modular Pre K School site, ready for use and occupancy by the North Andover School Department. The project includes all design and engineering required to meet all applicable code and regulatory groups and associations for early childhood education. The project includes all necessary site work and utility connections necessary and construction of the building that meets the intent of this RFP. The scope of work also includes the installation of a 2,500-3,500 SF pre-engineered metal building that will be part of the modular classroom addition

Awarding Authority:	**Town of North Andover, MA (School Building Committee)**
Owner's Project Manager:	**NV5**
Architect:	**KBA Architects**
Estimated Construction Cost:	**Not Specified**
Building Size:	**23,500 Gross Sq. Ft.**
Scheduled Occupancy:	**August 31, 2018**

Proposals must conform to the requirements set forth in this Request for Proposal (RFP). **The RFP will be available for download as of 9:00 a.m., Wednesday, November 1, 2017, at https://www.nv5.com/client-access/project-downloads/k-12/kindergarten-expansion-andover-ma/**

All offerors are invited to attend a Non Mandatory **Pre-Proposal site visit** scheduled for **3:00 pm, November 3, 2017**, at the North Andover Early Childhood Center, 115 Phillips Brooks Rd, North Andover, MA 01845.

Proposals mus**t be received before 10:00am** (l**ocal time) on Friday, November 17, 2017**, at the following location: **TOWN OF NORTH ANDOVER,** TOWN HALL, 120 Main Street, North Andover, MA 01845, attn. Mr. Ray Santilli (Assistant Town Manager)

Proposal procedures and award of the Contract shall be in accordance with the provision of MGL c149.s44E(4), including all currents amendments. Each proposal must include a certificate of eligibility in the category of work "Modular Construction / Prefabrication" and a complete update statement.

A complete description of the evaluation procedures and criteria is provided in the RFP. Prospective proposers shall not communicate with any person or entity participating on the Selection Committee at any time during this process except through written questions submitted in accordance with the process outlined in the RFP.

TABLE OF CONTENTS

PROPOSAL REQUIREMENTS, CONTRACT FORMS AND CONDITIONS OF THE CONTRACT

TECHNICAL SPECIFICATIONS

END OF SECTION

REQUEST FOR PROPOSAL

KINDERGARTEN MODULAR CLASSROOM ADDITION
NORTH ANDOVER E.C.C.

NORTH ANDOVER, MASSACHUSETTS

The Town of North Andover, acting by and through the School Building Committee, hereinafter called the "Awarding Authority", seeks proposals from qualified General Contractors for the transport, site work, utility connections, foundation, miscellaneous modifications to the site, provision, assembly and installation of modular units to the existing Early Childhood Center site, ready for use and occupancy by the North Andover School Department. The project includes all design and engineering required to meet all applicable code and regulatory groups and associations for early childhood education. The project includes all necessary site work and utility connections and construction of the building that meets the intent of this RFP.

Awarding Authority:	Town of North Andover, MA Acting by and through the School Building Committee
Owner's Project Manager:	NV5
Architect:	KBA Architects
Estimated Construction Cost:	$6,000,000
Building Size:	23,500 Gross Sq. Ft.
Substantial Completion:	August 20, 2018

Proposals must conform to the requirements set forth in this Request for Proposal (RFP).
The Request for Proposal, specifications manual and drawing set will be available for download as of 9:00 a.m. local legal time, Wednesday, November 1, 2017, at
https://www.nv5.com/client-access/project-downloads/k-12/kindergarten-expansion-andover-ma/

All offerors are invited to attend a **Non Mandatory Pre-Proposal site visit scheduled for 3:00 pm, November 3, 2017**, at the North Andover Early Childhood Center, 115 Phillips Brooks Rd, North Andover, MA 01845.

Proposals must be received before 10:00am (l**ocal time) on Friday, November 17, 2017**, at the following location: **TOWN OF NORTH ANDOVER,** TOWN HALL, 120 Main Street, North Andover, MA 01845, attn. Mr. Ray Santilli (Assistant Town Manager)

CONTRACTOR CERTIFICATE OF ELIGIBILITY

Proposals from the General Contractor will be valid only when accompanied by (1) a **Certificate of Eligibility issued by DCAMM in the category for Modular Construction / Prefabrication,** showing that the contractor has been approved to bid on Projects the size and nature of that advertised, and (2) an update statement summarizing the contractor's record for the period between the latest DCAMM Certification and the date the Contractor submits its Proposal. The Update Statements are not public records and will not be open to public inspection.

BID DEPOSITS

Cash, certified check, or a treasurer's check or cashier's check, issued by a responsible bank or trust company, or a bid bond payable to the Town of North Andover School Department shall be submitted with each bid in the amount of 5% of the bid.

Proposal procedures and award of the Contract shall be in accordance with the provision of MGL c149.s44E(4), including all currents amendments.

A complete description of the evaluation procedures and criteria is provided in this RFP. Prospective offerors shall not communicate with any person or entity participating on the Selection Committee at any time during this process except through written questions submitted in accordance with the process outlined in this RFP.

INSTRUCTIONS TO PROPOSERS

TOWN OF NORTH ANDOVER
Acting by and through the School Building Committee

Hereinafter called the "Awarding Authority":

PROPOSALS SHALL BE DELIVERED TO:
TOWN OF NORTH ANDOVER
TOWN HALL
120 Main Street
North Andover, MA 01845
Attn.: Ray Santilli, Assistant Town Manager

1.01 Proposal procedures and award of the Contract shall be in accordance with the provision of MGL c149.s44E(4), including all currents amendments. Each proposal must include a DCAMM certificate of eligibility in the category of work "Modular Construction / Prefabrication" and a complete Update Statement.

1.02 Proposals shall be received by the Awarding Authority at the address listed above, no later than:

10:00 AM, local legal time, Friday November 17, 2017

At which time and place the Awarding Authority will not open the proposals publicly, but will open them in the presence of one or more witnesses. Any proposal received after the time and date specified will not be considered. All proposals will be forthwith evaluated. Notwithstanding the provisions of MGL s.7 of c.4, until the completion of the evaluation, or until the time for acceptance specified in the RFP, whichever occurs earlier, the contents of the proposals will remain confidential and will not be disclosed to competing Proposers.

1.03 **The Request for Proposal, specifications manual and drawing set will be available electronically at 9:00 AM local legal time, on Wednesday, November 1, 2017** Link to download all documents: **https://www.nv5.com/client-access/project-downloads/k-12/kindergarten-expansion-andover-ma/** . Sign in is required prior to obtaining the documents.

1.04 A Non-mandatory pre proposal site briefing will be held by the Awarding Authority at **3:00 PM, on Friday, November 3, 2017 at the North Andover Early Childhood Center,** 115 Phillips Brooks Rd, North Andover, MA 01845. All proposers are invited to attend.

1.05 PROPOSER'S QUALIFICATIONS

A. Certification Form: signed by an authorized officer of the firm. No Proposer who is currently subject to debarment by the state or federal government shall be eligible to serve as Contractor or as Subcontractor on the Project.

B. No individual or firm may submit a Proposal unless it is accompanied by a CERTIFICATE OF ELIGIBILITY in the category of work "Modular Construction/Prefabrication" issued by the Massachusetts Division of Capital Asset Management (DCAMM) including a current DCAMM UPDATE STATEMENT on or before the time and date stipulated in this Request for Proposal in accordance with the above-referenced General Laws. The Update Statements are not public records and will not be open to public inspection.

C. All employees to be employed at the worksite shall have successfully completed a course in construction safety and health approved by the OSHA that at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

D. Furthermore, no individual or firm may submit a Proposal unless he/she, after proposal opening, is able to demonstrate to the satisfaction of the Awarding Authority that he/she does customarily perform modular classroom and associated site preparation work, has sufficient skilled and experienced labor force, and is able to meet the specified Project Schedule.

1.06 INTERPRETATION OF RFP DOCUMENTS: NOTIFICATION OF ERRORS

A. Interpretation of the provisions of the RFP Documents will be made by the Architect upon written request of any Proposer, provided that such request is received by the Architect at least six (6) days prior to date of proposal submission deadline, and that the Architect considers such interpretation to be of sufficient importance. Oral or telephone interpretations will not generally be made, and if made, shall be strictly informal and not legally valid or binding.

B. Questions can be submitted by email to **Inga Knox, NV5,** inga.knox@nv5.com, **no later than 5:00 PM local legal time on Thursday, November 9, 2017**.

C. Architect's interpretations shall be in the form of Addendum to the RFP Documents.

D. Proposers are urged to communicate any error or discrepancy found in the RFP Documents to the Architect. Telephone calls pointing out any such errors or discrepancies will be taken by the Architect, but only for the purpose of receiving the information in order that it may be properly processed, and not for interpretation or clarification.

1.07 ADDENDA

A. Addenda may be required during the RFP period to modify, clarify, or interpret the RFP Documents. Addenda shall be issued by the Architect electronically to all persons or parties to whom RFP Documents have been issued (Proposers of Record). Failure to receive such Addenda shall in no way relieve any Proposer from the execution of its provisions. All Proposers are cautioned to verify the number of Addenda that have been issued and to secure any needed copies from the Architect before submitting a proposal.

B. Addenda documents will be available electronically. Link to download Addenda documents: https://www.nv5.com/client-access/project-downloads/k-12/kindergarten-expansion-andover-ma/

A. Proposers shall acknowledge each and every Addendum in the spaces provided on the Price Proposal Form. Failure of a Proposer to acknowledge each and every Addendum in the space provided on the Price Proposal Form may cause rejection of the proposal.

1.08 EXAMINATION OF RFP DOCUMENTS AND SITE

A. Each Proposer shall carefully examine the RFP Documents in their entirety to obtain a thorough understanding of the work of his proposal in addition to work of related trades. In addition, each Proposer shall personally visit the site to become thoroughly acquainted with the field conditions as they exist thereon.

B. Failure of any Proposer to thoroughly examine the RFP Documents or to visit and examine the site shall in no way relieve the Proposer of any obligation with respect to his proposal or of any responsibility assigned the Proposer under the Contract.

1.09 MODIFICATION AND WITHDRAWAL OF PROPOSALS

A. Modifications or withdrawals of Proposals will be permitted after submission of such proposals provided clearly written, readily understandable instructions for same are received by the Awarding Authority in writing prior to time established for opening of such proposals.

B. No proposals may be withdrawn after that time, except as otherwise provided herein or by law for a period of 30 days, excluding Saturdays, Sundays and legal holidays from due day.

1.10 PRICE PROPOSAL FORM

A. The Awarding Authority will make available to every person applying therefore, a Price Proposal Form. Price Proposal must be submitted on the form provided by Awarding Authority and is included in the RFP documents. The price proposal is to be submitted per requirements setforth in Proposal Submission Requirements section of the RFP.

B. All blank spaces provided on the Price Proposal Form shall be filled in with ink or typewritten. Where space is provided, Total Contract Price shall be expressed in both words and figures. In case of discrepancy between the two, the written words shall govern.

C. No interlineations, additions, alterations, or erasures shall be made on the Form.

D. The Awarding Authority is exempt from sales and federal excise tax to the extent permitted under law; Proposers should not include such taxes in figuring or in references to any proposal.

1.11 ALTERNATES

A. Each proposer shall provide a proposed price on each alternate listed. In the event that any alternate does not involve a change in the amount of the price, the proposer shall so indicate by using the words "No Change" or insert "$0.00" in the space provided for that alternate.

1.12 SUBMISSION OF PROPOSAL

A. The Proposal shall be properly executed and enclosed and plainly marked on the outside with the following information:

PROPOSAL FOR:
KINDERGARTEN MODULAR CLASSROOM ADDITION TO THE E.C.C.
NORTH ANDOVER, MA

SUBMITTED BY: _____
(Name of Proposer)

_____
(Address of Proposer)

B. If Proposal is mailed, the above-required price proposal shall be enclosed in an envelope identified with the above markings and mailed to the place of Proposal opening, as described in the RFP. Mailed proposals must be received before time scheduled for opening of Proposals.

1.13 Prior to the execution of the contract, the selected Proposer shall furnish to the Awarding Authority a Payment Bond and a Performance Bond of a surety company qualified to issue bonds in the Commonwealth of Massachusetts and satisfactory to the Awarding Authority each in the sum of Contract Price; provided, however, that if there is more than (1) one surety company, the surety companies shall be jointly and severally liable. The cost of such bonds shall be included in the proposed price.

1.14 FOREIGN CORPORATIONS

A. The attention of Proposers are called to the General Laws, Chapter 30, Section 39L, as amended by The Acts of 1967, Chapter 3, under which the Awarding Authority may not enter into a contract with a foreign corporation (a corporation not organized under the Laws of Massachusetts), nor approve a foreign corporation as a subcontractor, unless the foreign corporation has filed with the Awarding Authority a certificate by the State Secretary stating that the foreign corporation has complied with General Laws, Chapter 181, Sections 3 and 5, and stating the date of such compliance.

1.15 Where applicable, wages and contributions to be paid employees on the Project shall not be less than those established by the schedule issued by the Commissioner of the Department of Labor and Workforse development of the Commonwealth of Massachusetts, in accordance with MGL c.149, s.26 to 27H inclusive, a copy of is included in the RFP documents and shall be made as part of the contract.

1.16 The Awarding Authority is exempt from sales and federal excise tax to the extent permitted under law. Proposers should not include such taxes in figuring or in references to any proposal.

1.17 AWARD OF CONTRACT

A. The Contract will be awarded to the most responsive, responsible, competent and eligible Proposer, as determined by the Awarding Authority.

B. Award will be made no later than 30 business days following completion of the evaluation process, unless such time is mutually extended.

C. The Awarding Authority reserves the right to reject any and all proposals.

1.18 Applicable Commonwealth of Massachusetts General Laws are incorporated herein by reference. Any inconsistency between the RFP Documents and these statues, or any other applicable statutes, bylaws, or regulation existing on the date on which the proposals are to be received, shall not be grounds for invalidating the RFP procedures, but, where required by law, such statute, bylaw, or regulation shall be deemed to govern.

1.19 The Awarding Authority will reject Proposals when required to so by the above-referenced General Laws. In addition, the Awarding Authority reserves the right and authority to reject and all Proposals or any part thereof, and/or to waive any informalities in the RFP if it is deemed by the Awarding Authority to be in the public interest to do so; or if less than three proposals are received; or if proposed prices are not acceptable without further competition. Pursuant to such right and authority, the Awarding Authority may, for example, reject the proposal of any contractor which the Awarding Authority has determined is not competent to perform the work as specified; or has exhibited a pattern or tendency of failing to complete such projects in a timely manner; or to comply with the applicable laws; or whose proposal is inaccurate or incomplete in anyway.

1.20 COMMENCEMENT AND COMPLETION OF WORK

A. The successful Proposer, upon execution of the Contract Agreement, shall commence the work of the Contract promptly after said execution of the Contract Agreement, and shall thereafter diligently and continuously carry on the work in such manner as to substantially complete the work of each phase in accordance with the specified Project Schedule.

1.21 LIQUIDATED DAMAGES

A. Liquidated damages for not completing the work within the time limit specified in the Project Schedule for each phase will be assessed to the Contractor. Liquidated damages will be in the amount as stipulated in Agreement Between Owner And Contractor which is $1000 per day. The liquidated damages amount per calendar day is a minimum damage figure to compensate the Awarding Authority for administrative costs and loss or delay of its use of the building or site, and for added Project Manager, Architect and consultant fees, and does not limit in any way the liability of the Contractor for damages in excess of the specified liquidated damages amount for other damages, in particular, damages for breach of Contract. It is expressly understood that such liquidated damages do not constitute a penalty.

END OF SECTION

PROJECT SCHEDULE

The Awarding Authority has established the project schedule as follows. Each proposer shall acknowledge that time is of the essence and shall prepare a Proposed Work Plan with detailed timeline, in accordance with the Project Schedule requirements, to clearly illustrate how he intends to accomplish all the required tasks, including, but not limited to, all on-site and off-site work and activities that may affect the work of this contract.

RFP Period: November 1, 2017 thru November 29, 2017

November 1, 2017	RFP advertisement published in the Central Register. Published RFP Documents available to all Offerors after 9:00 AM.
November 3, 2017	Non Mandatory Pre-Proposal site briefing 3:00 PM at the North Andover Early Childhood Center
November 17, 2017	Proposals due at 10:00AM at the North Andover Town Hall
November 20, 2017	Selected Finalists Interview, if required by Awarding Authority.
November 29, 2017	Anticipated Date of Award.

Design and Engineering Phase: December 8, 2017 thru March 16, 2018

January 15, 2018	Contractor completes engineering calculations, plans and specifications sealed and signed by a registered professional engineer licensed in Massachusetts and sufficient for state inspection and building permit application, including but not limited to: Site Plans and Details, including deck, ramps, stairs and walkways Building Foundation Plans and Details Floor plans Elevations Reflected Ceiling Plans Roof Plans Building Section Details Fire Protection Plans and Details Plumbing Plans and Details HVAC Plans and Details Electrical Plans and Details – power and lighting Low Voltage Signal and Telecommunication Plans and Details Contractor completes submittal process. Three (3) sets of sealed documents are required.
By January 15, 2018	Submit all modular addition information for approval by Architect
March 16, 2018	Contractor secures Building Permit.

Site Preparation Phase: April 5, 2018 thru May 20, 2018.

April 4, 2018	Contractor mobilizes to designated site area. Site preparation work for modular buildings begins. Construction Access Permit will be obtained by the District prior to mobilization date.
May 20, 2018	Modular classroom site preparation work complete. Disturbed site pavement patched for intended use. Contractor coordinates the utility service preparation work for modular construction with local agencies having jurisdiction.

Fabrication & Delivery Phase: March 9, 2018 thru May 20, 2018.

Fabricate at an off-site manufacturing facility, the modular units in accordance with the performance specifications, safety inspection/certification, building code and transportation requirements.

Modular Building Assembly and Installation Phase: May 25, 2018 thru August 20, 2018.

May 29, 2018	First modular units arrive on site, including surveys, escorts and permits, from manufacturing and/or storage facility to designated Project site area for modular buildings assembly and installation.
July 9, 2018	Owner's Separate Contractor begins interior renovation to the existing Early Childhood Center Elementary School Building under a separate contract.
August 20, 2018	Modular construction complete with final inspections by Awarding Authority, Architect and all authorities having jurisdiction. Contractor secures Occupancy Permit for the modular buildings. School access to modular buildings for school opening preparation. Awarding Authority completes the site and traffic work under a separate Site Work Contract.
September 6, 2018	Faculty and students occupy the modular buildings for full academic session.

END OF SECTION

PROPOSAL SUBMISSION REQUIREMENTS

1.01 GENERAL REQUIREMENTS

A. Proposal Format: Each Proposal should be submitted in plastic three-ring binder with front cover clearly labeled with project name and proposer's name. Contents should be tabbed with divider pages, and printed in 8-1/2" x 11" portrait format, or if necessary, folded 11" x 17" landscape format. Where applicable, plans or drawings larger than 11" x 17" should be folded and placed in 8-1/2" x 11" envelopes.

B. Number of Copies Required:

- For the Non-Price Proposal information, submit total of one original, seven duplicate copies and one electronic copy on disc or thumb drive.

- For the Price Proposal, submit one signed original & seven duplicate copies, all to be enclosed in a separate, sealed envelope.

  Note: Electronic only proposals will NOT be acceptable

C. Each Proposal shall consist of the following two parts.

1. Qualification Based Non-Price Proposal: will be opened and witnessed in private on the specified due date, at which time the names of firms submitting proposals will be recorded.

2. Price Proposal: will be opened separately after the evaluation of the Qualification Based Proposals has been completed.

1.02 QUALIFICATION BASED PROPOSAL

A. This part of the Proposal shall consist of the following components:

1. A cover letter: signed by an authorized officer of the firm, identifying the firm, containing a statement of interest and explaining why the firm is the best qualified contractor for this Project.

2. Certifications:

   a. Certification Form: signed by an authorized officer of the firm.
   b. DCAMM Certificate of Eligibility for "Modular Construction/ Prefabrication."
   c. DCAMM Update Statement.

3. Firm Qualifications:

   a. Firm History and Philosophy.

b. List of Similar Projects completed in the past 10 years, including project name, size, location, contract period, original proposed price and final cost.

c. References List: each Proposer shall provide at least three (3) references who can attest to the successful installation in the last five (5) years of similar modular construction such as identified in this proposal. Reference name, title, organization, address, phone numbers must be included for each project. Preferences should be given to educational projects located in Massachusetts and completed under MGL c.149, s.44E(4).

d. Project Team: including an Organization Chart with proposed Project Team. Identify firm's proposed Project Team members, including but not limited to Project Manager, Installation Manager, Site Supervisor, Maintenance Manager, Design Engineer, etc. each with contact information (including phone, cell, fax and email). Attach resumes listing professional and educational credentials.

e. A listing of all proposed sub-contractors, if used. The subcontractors associated with the disconnection, transport, and site assembly/installation procedures must have worked with the Proposer on at least three (3) successfully completed contracts in the last five (5) years. Provide subcontractor credentials.

f. Financial Statements that indicate gross contract income received over the past three years and signed contract projections for the next 3 years.

g. Safety Record: Provide the last three year insurance safety modifier. Each listing must be accompanied by a letter from the insurance company.

4. Work Plan: using CPM approach to clearly illustrate, with detailed time line, how the firm proposes to execute each phase of the work of the Contract to meet each critical milestone in accordance with the specified Project Schedule. Include both off site work tasks and on site logistics plan including storage, staging, laydown areas for installation and removal of modular units.

5. Modular Building Plans and Details: A set of building plans and details illustrate the proposed modular construction. The drawings submitted with each proposal must provide information necessary to portray all pertinent design and engineering details of the modular construction, including, but not limited to:

   a. An installation plan showing the proposed location of the modular buildings on the property; an indication of the locations on the modular buildings at which utility service connections are proposed; and locations of existing utility services to which the proposed modular buildings can be connected.
   b. Typical foundation and mounting details.
   c. Typical classroom plans with four interior elevations clearly defined and detailed to illustrate full understanding of the requirements specific to this project.

d. Typical plans and details of corridor and connector elements.
e. Typical modular unit structural elements including floors, walls and roof details.
f. Typical modular unit service appurtenances including mechanical, electrical, fire protection and telecommunication systems. Such details shall include all light fixtures, outlets, switches, controls, smoke detectors, and location and capacity/rating of all equipment, fixtures, and appliances.
g. Typical details of windows and doors.
h. Typical interior finish details for wall, floor and ceiling; exterior roof, skin finish and trim.

6. Modular Construction Specifications: Proposals must include Scope of Services and modular building specifications, organized in CSI Masterformat 2014 (48 Division), governing the materials and equipment used in the modular construction.

7. Warranties: The complete terms of all warranties provided by the manufacturer or by the Proposer relative to the design, manufacturing, installation and maintenance of the modular buildings, including both general warranties and special warranties associated with particular components and equipment, include, but not limited to, coverage and with response time for remedial work.

8. Modular Building Origins: Indication as to whether the proposed modular buildings will be either (1) manufactured within Massachusetts, or (2) manufactured outside of Massachusetts but within United States, or (3) manufactured outside of the United States. If a combination of two or three, the percentage of each. The distance from the Project Site will be calculated by the Awarding Authority based on Google Map search.

1.03 PRICE PROPOSAL

A. The Price Proposal shall be appended to the original copy of the Qualification Based Proposal in the three ring binder. The Price Proposal must be properly executed and enclosed in a sealed 8-1/2" x 11" envelope plainly marked on the outside with the following information:

Price Proposal for: Early Childhood Center
Modular Classroom Addition
North Andover, MA.

Submitted by: _____
(Name of Proposer)

_____
(Address of Proposer)

B. Submit price proposal using the Price Proposal Form. The Price Proposal Form must be signed by an individual authorized to bind the Proposer contractually.

C. A Bid Deposit in the amount of five percent (5%) of the proposed Total Contract Price (including Alternates) shall also be included with Price Proposal. The deposit must be in the form of a bank, treasurer's or certified check or a bid bond written by a surety company authorized and licensed to do business in the Commonwealth of Massachusetts and acceptable by the Awarding Authority. Bid Bond shall be made payable to the Town of North Andover.

D. The Awarding Authority is exempt from sales and federal excise tax to the extent permitted under law; Offerors should not include such taxes in figuring or in references to any proposal.

1.04 Any Proposer may correct, modify, or withdraw his/her proposal by written notice received prior to the time and date designated for the opening of the Proposals. After the deadline for submitting proposals has past, a Proposer may not change the price or any other provisions of his/her proposal in a manner prejudicial to the interest of the Awarding Authority or fair competition. The Awarding Authority, at its own discretion, with or without cause, may waive minor informalities or allow the Proposer to correct them. All decisions by the Awarding Authority are final.

1.05 After the opening of the Proposals, a register of qualified proposals received will be published and mailed to each Proposer.

1.06 To complete RFP process, up to three Offerors may be requested to make an in-person presentation to the Town of North Andover School Building Committee, if deemed necessary by the Awarding Authority.

END OF SECTION

PRICE PROPOSAL FORM

TO THE AWARDING AUTHORITY:

A. The undersigned proposes to furnish all labor, materials and equipment required for the site preparation, fabrication, delivery and assembly/installation of the:

EARLY CHILDHOOD CENTER
KINDERGARTEN MODULAR CLASSROOM ADDITION
NORTH ANDOVER, MA

in accordance with RFP Documents prepared by the Architect

Knight, Bagge & Anderson, Inc.
6 Thirteenth Street
Charlestown, MA 02129

for the Contract Price specified below, subject to additions and deductions according to the terms of the Specifications.

B. This Proposal includes Addenda numbered: _____.

C. The Proposed Total Contract Price is:

_____ Dollars
($)

The Proposed Total Contract Price is further itemized as follows:

BASE BID:

Item No.	Description	Proposed Price
1	Site Preparation, Foundation, Utilities and associated Site Work	$
2	Modular Unit Fabrication, Delivery, Assembly, Installation and Construction	$
3	2,200 s.f. Pre-Engineered Modular Building Materials and Installation including Build-out	$

Alternates

Alternate No. 1	Submit the additional cost to furnish and construct a 3,200 s.f. pre-engineered metal building in lieu of the 2,200 s.f. building that is included under the base bid.	$
Alternate No. 2	Furnish and install the combined Unified Art & Science space	$

D. The undersigned agrees that, if selected as Contractor, he/she will within five (5) days, Saturdays, Sundays, and legal holidays excluded, after presentation thereof by the Awarding Authority, execute the Contract in accordance with the terms of this Proposal and furnish a Performance Bond and a Labor and Materials Payment Bond of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Awarding Authority, each in the amount no less than 100% of the Contract Price. The premiums for those bonds are to be paid by the Contractor and are included in the Proposed Price.

E. The undersigned hereby certifies that he/she is able to furnish labor that can work in harmony with Owner's separate contractor(s) and all other elements of labor employed or to be employed on the work and that he/she will comply fully with all laws and regulations applicable to awards made subject to MGL c.149, § 44E.

F. The undersigned hereby certifies that all employees to be employed at the worksite have successfully completed a course in construction safety and health approved by the OSHA that at least 10 hours in duration at the time the employee begins work.

G. The undersigned bidder hereby certifies, under the pains and penalties of perjury, the foregoing proposal is based upon the payment to laborers to be employed on the Project of wages in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned Proposer agrees to indemnify the Awarding Authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work, arising out of or as a result if (1) the failure of the said bid to be based upon the payment of the said applicable prevailing wages rates or (2) the failure of the Proposer, if selected as the Contractor, to pay laborers employed on the Project the said applicable prevailing wage rates.

H. The undersigned further certifies under the penalties of perjury that this Proposal is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

I. The undersigned further certifies under penalties of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of Section 29F of Chapter 29, or any other applicable debarment provisions of any chapter of the General Laws or any rule or regulation promulgated thereunder.

Date: _____

_____
(Name of Proposer)

Signed: _____

(Seal)

By: _____
(Print Name and Title of Person Signing Proposal)

_____
(Business Address)

_____
(City and State)

_____
(Business Telephone Number)

REFERENCES

The undersigned offers the following information as evidence of his qualifications to perform the work as proposed according to all the requirements of the RFP Documents:

1. Have been in business under present business name for _____ years.

2. Ever failed to complete any work awarded? _____.

3. List three (3) projects completed in the past ten (10) years on which you served as contractor for work of similar character as required for this project:

Project	Owner	Phone No.	Amount of Contract
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4. Bank Reference: _____.

PERFORMANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS, that we _____ with a place of business at _____, as Principal (the "Principal"), and _____, a corporation qualified to do business in the Commonwealth of Massachusetts, with a place of business at _____ as Surety (the "Surety"), are held and firmly bound unto the Town of North Andover, Massachusetts as Obligee (the "Obligee"), in the sum of _____ lawful money of the United States of America, to be paid to the Obligee, for which payment, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has assumed and made a Contract with the Obligee, bearing the date of _____, for the construction of _____ _____.

NOW THE CONDITIONS of this obligation are such that if the Principal (and all Subcontractors under said contract) shall well and truly keep and perform all the undertakings, covenants, agreement, terms and conditions of said contract on its part to be kept and performed during the original term of said contract and any extensions thereof that may be granted by the Obligee, with or without notice to the Surety, and during the life and any guarantee required under the contract, and shall also well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of any and all duly authorized modifications, alterations, changes or additions with notice to the Surety being hereby waived, then this obligation shall become null and void; otherwise, it shall remain in full force and virtue.

IN THE EVENT the Contract is abandoned by the Principal, or is terminated by the Town of North Andover, Massachusetts under the applicable provisions of the Contract, the Surety hereby further agrees that the Surety shall, if requested in writing by the Town of North Andover, Massachusetts promptly take such action as is necessary to complete said Contract in accordance with its terms and conditions.

IN WITNESS WHEREOF, the Principal and Surety have hereto set their hands and seals this _____ day of _____.

PRINCIPAL	SURETY
_____	_____
_____ [Name and Seal]	_____ [Attorney-in-fact] [Seal]
_____ [Title]	_____ [Address]
Attest: _____	_____ [Phone]
	Attest: _____

END OF PERFORMANCE BOND

PAYMENT BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS, that we _____
with a place of business at _____,
as Principal (the "Principal"), and _____, a
corporation qualified to do business in the Commonwealth of Massachusetts, with a place of business at
_____ as Surety
(the "Surety"), are held and firmly bound unto the Town of North Andover, Massachusetts as Obligee
(the "Obligee"), in the sum of _____ lawful money of
the United States of America, to be paid to the Obligee, for which payment, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has assumed and made a contract with the Obligee, bearing the date of _____, for the construction of _____
_____.

NOW, THE CONDITIONS of this obligation are such that if the Principal and all subcontractors under said contract shall pay for all labor performed or furnished and for all materials used or employed in said contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said contract that may hereafter be made, notice to the Surety of such modifications, alterations, extensions of time, changes or additions being hereby waived, the foregoing to include, but not be limited to, any other purposes or items set out in, and to be subject to, the provisions of Massachusetts General Laws, Chapter 30, Section 39M, and Chapter 149, Section 29, as amended then this obligation shall become null and void; otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREFORE, the Principal and Surety have hereto set their hands and seals this _____ day of _____.

PRINCIPAL	SURETY
_____	_____
_____	_____
[Name and Seal]	[Attorney-in-fact] [Seal]
_____	_____
[Title]	[Address]
Attest: _____	_____
	[Phone]
	Attest: _____

END OF PAYMENT BOND

COMPARATIVE EVALUATION CRITERIA

1.01 COMPARATIVE EVALUATION CRITERIA

Proposals received by the Awarding Authority and satisfying the submission requirements will be reviewed and graded based on the following Comparative Evaluation Criteria. Proposals meeting the minimum requirements will be evaluated as to the level of the proposal submission satisfy the evaluation criteria. Each evaluation criteria has four rated levels: HIGHLY ADVANTAGEOUS, ADVANTAGEOUS, ACCEPTABLE, and UNACCEPTABLE.

Pursuant to MGL c.149, s.44E(4), the Awarding Authority, in determining the most advantageous proposal, shall give preference, other considerations being equal, first to modular buildings transported within Massachusetts, and second to those transported outside of Massachusetts but within the United States.

The Awarding Authority may reject any and all proposals, with or without cause, and all decisions of the Awarding Authority are final without recourse.

The following Evaluation Criteria will be applied to each proposal:

1. The overall quality of the Proposal:

    HIGHLY ADVANTAGEOUS
    if the proposal is responsive, very well organized and contains more than sufficient information required for Awarding Authority to complete the evaluation.

    ADVANTAGEOUS
    if the proposal is responsive and well organized with sufficient information required for Awarding Authority to complete the evaluation.

    ACCEPTABLE
    if the proposal is responsive and contains adequate information required for Awarding Authority to complete the evaluation.

    UNACCEPTABLE
    if the proposal is non-responsive, poorly organized and contains insufficient information required for Awarding Authority to complete the evaluation.

2. Safety Record:

    HIGHLY ADVANTAGEOUS
    If the Insurance Modifier is 1.0 or lower.

    ADVANTAGEOUS
    If the Insurance Modifier is between 1.1 to 1.3.

ACCEPTABLE
If the Insurance Modifier is between 1.4 to 1.5.

UNACCEPTABLE
If the Insurance Modifier is greater than 1.5.

3. Modular Units transportation origin:

HIGHLY ADVANTAGEOUS
if the proposed modular units are transported within Massachusetts.

ADVANTAGEOUS
if the proposed modular units are transported within USA and within 1,000 miles from Massachusetts.

ACCEPTABLE
if the proposed modular units are transported anywhere but within 1,500 miles from Massachusetts.

UNACCEPTABLE
if the proposed modular units are transported beyond 2,000 miles from Massachusetts.

4 a. Prior similar experience: Modular Classrooms or other Modular Building Types

HIGHLY ADVANTAGEOUS
if more than three (3) similar projects completed satisfactory within the last ten (10) years under MGL c.149, s.44E.

ADVANTAGEOUS
if three (3) similar projects completed satisfactory in the last ten (10) years and at least two under MGL c.149, s.44E.

ACCEPTABLE
if three (3) similar projects completed satisfactory in the last ten (10) years and at least one under MGL c.149, s.44E.

UNACCEPTABLE
if no similar projects completed satisfactory within the last ten (10) years, or project completed under MGL c.149, s.44E.

4 b. Prior similar experience: Pre-Engineered Metal Buildings

HIGHLY ADVANTAGEOUS
if more than three (3) similar projects completed satisfactory within the last ten (10) years.

ADVANTAGEOUS (3 points)
if three (3) similar projects completed satisfactory in the last ten (10) years.

ACCEPTABLE (2 points)
if three (3) similar projects completed satisfactory in the last ten (10) years.

UNACCEPTABLE (1 point)
if no similar projects completed satisfactory in the last ten (10) years.

5. Schedule:

HIGHLY ADVANTAGEOUS (4 points)
for the proposal providing a detail Work Plan using CPM to illustrate all activities including obtaining certificate of occupancy upon Substantial Completion on or before August 20, 2018.

ADVANTAGEOUS (3 points)
for the proposal providing a Work Plan using CPM to illustrate major activities including obtaining certificate of occupancy upon Substantial Completion on or before August 20, 2018.

ACCEPTABLE (2 points)
for the proposal providing a Work Plan using CPM to illustrate milestone activities including obtaining certificate of occupancy upon Substantial Completion on August 20, 2018.

UNACCEPTABLE (1 point)
for the proposal providing a Work Plan without using CPM; or cannot achieve certificate of occupancy upon Substantial Completion on August 20, 2018.

6. Deviation and/or variation statement:

HIGHLY ADVANTAGEOUS (4 points)
if there are no or minor qualifications or exclusions which do not affect the schedule, quality or performance of work but allow for cost savings.

ADVANTAGEOUS (3 points)
if there are minor qualifications or exclusions which do not affect the schedule, quality or performance of the work.

ACCEPTABLE (2 points)
if there are minor qualifications or exclusions which do not significantly affect the schedule, quality or performance of the work and are acceptable by the Awarding Authority.

UNACCEPTABLE (1 point)
if there are qualifications or exclusions which affect the schedule, quality or performance of the work.

7. References:

HIGHLY ADVANTAGEOUS (4 points)
if more than three (3) positive references of the proposed project team are from three (3) similar school projects successfully completed in Massachusetts within the past ten (10) years.

ADVANTAGEOUS (3 points)
if three (3) positive references of the proposed project team are from three (3) similar school projects successfully completed in Massachusetts within the past ten (10) years.

ACCEPTABLE (2 points)
if three (3) positive references of the proposed project team are from three (3) similar school projects successfully completed in New England within the past ten (10) years.

UNACCEPTABLE (1 point)
if the proposer is unable to provide three positive reference of the proposed project team from similar school projects successfully completed in New England within the past ten (10) years.

1.02 A short list of firms will be determined and ranked in order by the Awarding Authority as represented by the Awarding Authority and its designees in accordance with the criteria.

1.03 Selection process:

1. Proposals will be evaluated upon the basis of the criteria for evaluation set forth and will then be ranked in order of qualification. This further review and evaluation may include interviews or the opportunity to provide additional information to the reviewers.

2. Evaluation of Price Proposals. When the non-price proposal information has been evaluated, each price proposal will be opened, reviewed and recorded.

3. The Awarding Authority reserves the right to request further information and/or in person presentation from the three (3) highest ranked Proposers. The Awarding Authority will determine the most advantageous proposal from a responsible, responsive, and eligible Proposer, taking into consideration both price and ratings on the evaluation criteria contained in this Section.

4. The evaluation of proposals and determination of the most advantageous proposal shall be made in accordance with M.G.L. Chapter 149, Section 44E(4).

END OF SECTION

PROPOSER'S LISTING OF DEVIATION AND/OR VARIATION FROM PLANS OR SPECIFICATION

(Part of Non-Price Proposal)

List by Specification or plan where proposed deviations from bid documents will take place:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

NOTE: List must be attached to information requested for non-price proposal. List will be part of minimum/evaluation criteria. If no deviation / variation from specification, complete form noting "No Deviation and/or Variation from Specification".

_____

Proposer's Authorized Signature

END OF DEVIATIONS/VARIATION

TOWN OF NORTH ANDOVER

CONTRACT

CONTRACT #_____

DATE: _____

This Contract is entered into on, or as of, this date by and between the Town of North Andover (the "Town"), and

Contractor: _

Address: _
_

Telephone Number: _

Fax Number: _

1. This is a Contract for the procurement of the following:

2. The Contract price to be paid to the Contractor by the Town of North Andover is:

3. Payment will be made as follows:

4. Definitions

   4.1 Acceptance: All Contracts require proper acceptance of the described goods or services by the Town of North Andover. Proper acceptance shall be understood to include inspection of goods and certification of acceptable performance for services by authorized representatives of the Town to insure that the goods or services are complete and are as specified in the Contract.

4.2 Contract Documents: All documents relative to the Contract including (where used) Instructions to Bidders, Proposal Form, General Conditions, Supplementary General Conditions, General Specifications, Other Specifications included in Project Manual, Drawings, and all Addenda issued during the bidding period. The Contract documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intention of the document is to include all labor and materials, equipment and transportation necessary for the proper performance of the Contract.

4.3 The Contractor: The "other party" to any Contract with the Town. This term shall (as the sense and particular Contract so require) include Vendor, Contractor, Engineer, or other label used to identify the other party in the particular Contract. Use of the term "Contractor" shall be understood to refer to any other such label used.

4.4 Date of Substantial Performance: The date when the work is sufficiently complete, the services are performed, or the goods delivered, in accordance with Contract documents, as modified by approved Amendments and Change Orders.

4.5 Goods: Goods, Supplies or Materials.

4.6 SubContractor: Those having a direct Contract with the Contractor. The term includes one who furnished material worked to a special design according to the Drawings or Specifications of this work, but does not include one who merely furnishes material not so worked.

4.7 Work: The services or materials contracted for, or both.

5. Term of Contract and Time for Performance

This Contract shall be fully performed by the Contractor in accordance with the provisions of the Contract Documents on or before _____, unless extended pursuant to a provision for extension contained in the Contract documents at the sole discretion of the Town, and not subject to assent by the Contractor, and subject to the availability and appropriation of funds as certified by the Town Accountant. The time limits stated in the Contract documents are of the essence of the Contract.

6. Subject to Appropriation

Notwithstanding anything in the Contract documents to the contrary, any and all payments which the Town is required to make under this Contract shall be subject to appropriation or other availability of funds as certified by the Town Accountant. In the absence of appropriation, this Contract shall be immediately terminated without liability for damages, penalties or other charges.

7. Permits and Approvals

Permits, Licenses, Approvals and all other legal or administrative prerequisites to its performance of the Contract shall be secured and paid for by the Contractor.

8. Termination and Default

8.1 Without Cause. The Town may terminate this Contract on seven (7) calendar days notice when in the best interests of the Town by providing notice to the Contractor, which shall be in writing and shall be deemed delivered and received when given in person to the Contractor, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the Contractor. Upon termination without cause, Contractor will be paid for services rendered to the date of termination.

8.2 For Cause. If the Contractor is determined by the Town to be in default of any term or condition of this Contract, the Town may terminate this Contract on seven (7) days notice by providing notice to the Contractor, which shall be in writing and shall be deemed delivered and received when given in person to the Contractor, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the Contractor.

8.3 Default. The following shall constitute events of a default under the Contract:

1) any material misrepresentation made by the Contractor to the Town; 2) any failure to perform any of its obligations under this Contract including, but not limited to the following: (i) failure to commence performance of this Contract at the time specified in this Contract due to a reason or circumstance within the Contractor's reasonable control, (ii) failure to perform this Contract with sufficient personnel and equipment or with sufficient material to ensure the completion of this Contract within the specified time due to a reason or circumstance within the Contractor's reasonable control, (iii) failure to perform this Contract in a manner reasonably satisfactory to the Town, (iv) failure to promptly re-perform within a reasonable time the services that were rejected by the Town as unsatisfactory, or erroneous, (v) discontinuance of the services for reasons not beyond the Contractor's reasonable control, (vi) failure to comply with a material term of this Contract, including, but not limited to, the provision of insurance and non-discrimination, (vii) any other acts specifically and expressly stated in this Contract as constituting a basis for termination of this Contact, and (viii) failure to comply with any and all requirements of state law and/or regulations, and Town bylaw and/or regulations.

9. The Contractor's Breach and the Town's Remedies

Failure of the Contractor to comply with any of the terms or conditions of this Contract shall be deemed a material breach of this Contract, and the Town of North Andover shall have all the rights and remedies provided in the Contract documents, the right to cancel, terminate, or suspend the Contract in whole or in part, the right to maintain any and all actions at law or in equity or other proceedings with respect to a breach of this Contract, including damages and specific performance, and the right to select among the remedies available to it by all of the above.

From any sums due to the Contractor for services, the Town may keep the whole or any part of the amount for expenses, losses and damages incurred by the Town as a consequence of

procuring services as a result of any failure, omission or mistake of the Contractor in providing services as provided in this Contract.

10. Statutory Compliance

10.1 This Contract will be construed and governed by the provisions of applicable federal, state and local laws and regulations; and wherever any provision of the Contract or Contract documents shall conflict with any provision or requirement of federal, state or local law or regulation, then the provisions of law and regulation shall control. Where applicable to the Contract, the provisions of the General Laws are incorporated by reference into this Contract, including, but not limited to, the following:

General Laws Chapter 30B – Procurement of Goods and Services.

General Laws Chapter 30, Sec. 39, *et seq*: - Public Works Contracts.

General Laws Chapter 149, Section 44A, *et seq*: Public Buildings Contracts.

10.2 Wherever applicable law mandates the inclusion of any term and provision into a municipal contract, this Section shall be understood to import such term or provision into this Contract. To whatever extent any provision of this Contract shall be inconsistent with any law or regulation limiting the power or liability of cities and towns, such law or regulation shall control.

10.3 The Contractor shall give all notices and comply with all laws and regulations bearing on the performance of the Contract. If the Contractor performs the Contract in violation of any applicable law or regulation, the Contractor shall bear all costs arising therefrom.

10.4 The Contractor shall keep itself fully informed of all existing and future State and National Laws and Municipal By-laws and Regulations and of all orders and decrees of any bodies or tribunals having jurisdiction in any manner affecting those engaged or employed in the work, of the materials used in the work or in any way affecting the conduct of the work. If any discrepancy or inconsistency is discovered in the Drawings, Specifications or Contract for this work in violation of any such law, by-law, regulation, order or decree, it shall forthwith report the same in writing to the Town. It shall, at all times, itself observe and comply with all such existing and future laws, by-laws, regulations, orders and decrees; and shall protect and indemnify the Town of North Andover, and its duly appointed agents against any claim or liability arising from or based on any violation whether by him or its agents, employees or subcontractors of any such law, by-law, regulation or decree.

11. Conflict of Interest

Both the Town and the Contractor acknowledge the provisions of the State Conflict of Interest Law (General Laws Chapter 268A), and this Contract expressly prohibits any activity which shall constitute a violation of that law. The Contractor shall be deemed to have investigated the application of M.G.L. c. 268A to the performance of this Contract; and by executing the Contract documents the Contractor certifies to the Town that neither it nor its agents, employees, or subcontractors are thereby in violation of General Laws Chapter 268A.

12. Certification of Tax Compliance

This Contract must include a certification of tax compliance by the Contractor, as required by General Laws Chapter 62C, Section 49A (Requirement of Tax Compliance by All Contractors Providing Goods, Services, or Real Estate Space to the Commonwealth or Subdivision).

13. Discrimination

The Contractor will carry out the obligations of this Contract in full compliance with all of the requirements imposed by or pursuant to General Laws Chapter 151B (Law Against Discrimination) and any executive orders, rules, regulations, and requirements of the Commonwealth of Massachusetts as they may from time to time be amended.

14. Assignment

Assignment of this Contract is prohibited, unless and only to the extent that assignment is provided for expressly in the Contract documents.

15. Condition of Enforceability Against the Town

This Contract is only binding upon, and enforceable against, the Town if: (1) the Contract is signed by the Town Manager or its designee; and (2) endorsed with approval by the Town Accountant as to appropriation or availability of funds; and (3) endorsed with approval by the Town Counsel as to form.

16. Corporate Contractor

If the Contractor is a corporation, it shall endorse upon this Contract (or attach hereto) its Clerk's Certificate certifying the corporate capacity and authority of the party signing this Contract for the corporation. Such certificate shall be accompanied by a letter or other instrument stating that such authority continues in full force and effect as of the date the Contract is executed by the Contractor. This Contract shall not be enforceable against the Town of North Andover unless and until the Contractor complies with this section.

The Contractor, if a foreign corporation, shall comply with the provisions of the General Laws, Chapter 181, Sections 3 and 5, and any Acts and Amendments thereof, and in addition thereto, relating to the appointment of the Commissioner of Corporations as its attorney, shall file with the Commissioner of Corporations a Power of Attorney and duly authenticated copies of its Charter or Certificate of Incorporation; and said Contractor shall comply with all the laws of the Commonwealth.

17. Liability of Public Officials

To the full extent permitted by law, no official, employee, agent or representative of the Town of North Andover shall be individually or personally liable on any obligation of the Town under this Contract.

18. Indemnification

The Contractor shall indemnify, defend and save harmless the Town, the Town's officers, agents and employees, from and against any and all damages, liabilities, actions, suits, proceedings, claims, demands, losses, costs, expenses, recoveries and judgments of every nature and description (including reasonable attorneys' fees) that may arise in whole or in part out of or in connection with the work being performed or to be performed, or out of any act or omission by the Contractor, its employees, agents, subcontractors, material men, and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by any party indemnified hereunder. The Contractor further agrees to reimburse the Town for damage to its property caused by the Contractor, its employees, agents, subcontractors or material men, and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, including damages caused by his, its or their use of faulty, defective, or unsuitable material or equipment, unless the damage is caused by the Town's gross negligence or willful misconduct. The existence of insurance shall in no way limit the scope of the Contractor's indemnification under this contract.

19. Workers Compensation Insurance

The Contractor shall provide by insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws of Massachusetts (The Worker's Compensation Act) to all employees of the Contractor who are subject to the provisions of Chapter 152 of the General Laws of Massachusetts.

Failure to provide and continue in force such insurance during the period of this Contract shall be deemed a material breach of this Contract, shall operate as an immediate termination thereof, and Contractor shall indemnify the Town for all losses, claims, and actions resulting from the failure to provide the insurance required by this Article.

The Contractor shall furnish to the Town evidence of such insurance prior to the execution of this Contract before the same shall be binding on the parties thereto, except if specifically waived by the Town.

20. Documents, Materials, Etc.

Any materials, reports, information, data, etc. given to or prepared or assembled by the Contractor under this Contract are to be kept confidential and shall not be made available to any individual or organization by the Contractor (except agents, servants, or employees of the Contractor) without the prior written approval of the Town, except as otherwise required by law. The Contractor shall comply with the provisions Chapter 66A of the General Laws of Massachusetts as it relates to public documents, and all other state and federal laws and regulations relating to confidentiality, security, privacy and use of confidential data.

Any materials produced in whole or in part under this Contract shall not be subject to copyright, except by the Town, in the United States or any other country. The Town shall have unrestricted authority to, without payment of any royalty, commission, or additional fee of any type or nature,

publicly disclose, reproduce, distribute and otherwise use, and authorize others to use, in whole or in part, any reports, data or other materials prepared under this Contract.

All data, reports, programs, software, equipment, furnishings, and any other documentation or product paid for by the Town shall vest in the Town at the termination of this Contract. The Contractor shall at all times, during or after termination of this Contract, obtain the prior written approval of the Town before making any statement bearing on the work performed or data collected under this Contract to the press or issues any material for publication through any medium.

21. Audit, Inspection and Recordkeeping

At any time during normal business hours, and as often as the Town may deem it reasonably necessary, there shall be available in the office of the Contractor for the purpose of audit, examination, and/or to make excerpts or transcript all records, contracts, invoices, materials, payrolls, records of personnel, conditions of employment and other data relating to all matters covered by this Agreement.

22. Payment

The Town agrees to make all reasonable efforts to pay to the Contractor the sum set forth in the Contractor's bid or proposal within thirty (30) days of receipt of an invoice detailing the work completed and acceptance from the Town of the work completed.

23. Waiver and Amendment

Amendments, or waivers of any additional term, condition, covenant, duty or obligation contained in this Contract may be made only by written amendment executed by all signatories to the original Agreement, prior to the effective date of the amendment.

To the extent allowed by law, any conditions, duties, and obligations contained in this Contract may be waived only by written Agreement by both parties.

Forbearance or indulgence in any form or manner by a party shall not be construed as a waiver, nor in any manner limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach shall constitute a waiver of any subsequent default or breach of a similar or different matter.

24. Forum and Choice of Law

This Contract and any performance herein shall be governed by and be construed in accordance with the laws of the Commonwealth. Any and all proceedings or actions relating to subject matter herein shall be brought and maintained in the courts of the Commonwealth or the federal district court sitting in the Commonwealth, which shall have exclusive jurisdiction thereof. This paragraph shall not be construed to limit any other legal rights of the parties.

25. Notices

Any notice permitted or required under the provisions of this Contract to be given or served by either of the parties hereto upon the other party hereto shall be in writing and signed in the name or on the behalf of the party giving or serving the same. Notice shall be deemed to have been received at the time of actual service or three (3) business days after the date of a certified or registered mailing properly addressed. Notice to the Contractor shall be deemed sufficient if sent to the address set forth in the Contract and to the Town of North Andover by being sent to the Town Manager, Town Hall, 120 Main Street, North Andover, Massachusetts 01845.

26. Binding on Successors

This Contract shall be binding upon the Contractor, its assigns, transferees, and/or successors in interest (and where not corporate, the heirs and estate of the Contractor).

27. Complete Contract

This instrument, together with its endorsed supplements, and the other components of the contract documents, constitutes the entire contract between the parties, with no agreements other than those incorporated herein.

28. Supplemental Conditions

The foregoing provisions apply to all contracts to which the Town of North Andover shall be a party. One of the following "Supplements" *must* be "checked" as applicable to this Contract, shall be attached hereto, and shall in any event apply as the nature of the Contract requires. The Supplement contains additional terms governing the Contract:

[ ] GOODS

SUPPLEMENT "G" - Applicable to Contracts for the procurement of Goods (governed by the provisions of General Laws Chapter 30B)

[ ] SERVICES

SUPPLEMENT "S" - Applicable to Contracts for the procurement of Services (governed by the provisions of General Laws Chapter 30B)

[ ] CONSTRUCTION

SUPPLEMENT "C" - Applicable to Contracts for Construction

IN WITNESS WHEREOF the parties have hereto and to two other identical instruments set forth their hands the day and year first above written.

THE TOWN

_____
Division/Department Head

_____
Town Manager Date

THE CONTRACTOR

_____
Company Name

_____
Signature Date

_____
Print Name & Title

Federal Identification
No.:_____

APPROVED AS TO FORM:

_____
Town Counsel Date

CERTIFICATION AS TO AVAILABILITY OF FUNDS:

_____
Town Accountant Date

SUPPLEMENT "C"

[] CONSTRUCTION

SUPPLEMENT "C" - Applicable to Contracts for the construction of:

(1) Public Buildings and Public Works
(governed by the provisions of General Laws Chapter 30B);

(2) Public Buildings
(governed by the provisions of General Laws Chapter 149,§ 44A, et seq.); and

(3) Public Works
(governed by the provisions of General Laws Chapter 30, §39M, et seq)

1. This form supplements the Town of North Andover "Contract and General Conditions" and applies only to contracts for the construction, reconstruction, alteration, remodeling or repair of public works or public buildings.

2. Wherever the law requires one contracting with a city or town to be bonded, such obligation shall be understood to be a term and condition of this Contract. The Contractor agrees to secure such bond (where required) in the form required by the Town and provide an original thereof to the Town prior to the commencement of performance.

3. Equality:

   3.1. In the case of a closed Specification written for a specific item or items to be furnished under the Base Bid, such specifications shall, as applicable, be in compliance with the Massachusetts General Laws, Chapter 30, Section 39M and Chapter 149, Sec. 44A et seq.

   3.2. Where the name of an item, material or manufacturer is mentioned in the Specifications or on the Drawings, except as above noted, the intent is to establish a standard and in no way should be construed to exclude any item or manufacturer not mentioned by name, but whose product meets the Specifications as to design, utility and quality. Final decision shall rest with the Project Representative as to its acceptability.

4. Change orders to contracts governed by General Laws Chapter 30B may not increase the quantity of goods or services provided by more than twenty-five (25%) per cent, in compliance with Sec. 13 of Chapter 30B.

5. The Contractor will carry out the obligations of this contract in full compliance with all of the requirements imposed by or pursuant to General Laws Chapter 151, Sec. 1, et seq. (Minimum Wage Law) and any executive orders, rules, regulations, and requirements of the Commonwealth of Massachusetts as they may from time to time be amended. The Contractor will at all times comply with the wage rates as determined by the Commissioner of the Department of Labor and Industries, under the provisions of General Laws Chapter 149, Sections 26 and 27D (Prevailing Wage), as shall be in force and as amended.

6. The Contractor shall continuously maintain adequate protection of all work from damage and shall protect the property of the Town and others, including adjacent property, from injury or loss arising

in connection with the Contract. The Contractor shall make good any such damage, injury or loss, except as may be directly due to errors in the Contract Documents or caused by agents or employees of the Town, or due to causes beyond the Contractor's control and not the Contractor's fault or negligence.

7. The Contractor shall take all necessary precautions for the safety of employees on the work, and shall comply with all applicable provisions of Federal, State and local laws and codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. The Contractor will erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of workers and the public, shall post danger signs warning against the hazards created by such features of construction such as pits, protruding nails, hosts, well holes, elevator hatchways, scaffolding, window openings, stairways and falling materials; and shall designate a responsible member of its organization on the work, whose duty shall be the prevention of accidents.

8. The Town shall at all times have access to the work wherever it is in preparation or progress and the Contractor shall provide suitable accommodations for such access.

9. The Contractor shall appoint a competent superintendent and foreman and any necessary assistants, all of whom shall be satisfactory to the Town. If the Town in its sole discretion determines that the construction superintendent, foreman, or assistants are unacceptable to the Town, then upon seven days notice from the Town, the Contractor shall replace such person or persons with people acceptable to the Town.

10. The Contractor shall give efficient supervision to the work, using its best skill and attention. The Contractor shall carefully study and compare the drawings, specifications and other instructions and shall at once report to the Town any error, inconsistency or omission which shall be discovered. Included in this responsibility shall be supervision of all work performed by subcontractors on the work.

11. If the Contractor should neglect to prosecute the work properly, or fail to perform the contract or any of its provisions, the Town, upon three days written notice, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

12. <u>Inspection by the Town's Project Representative</u>

    12.1. The Town shall have the right to designate a Project Representative who may make periodic visits to the site to familiarize the Town generally with the progress and quality of the work, and to determine in general if the work is proceeding in accordance with the Contract Documents. The Project Representative will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the work, and will not be responsible for the Contractor's failure to carry out the construction work in accordance with the Contract Documents. During such visits and on the basis of these observations while at the site, the Project Representative will keep the Town informed on the progress of the work, will endeavor to guard the Town against defects and deficiencies in the work of contractors, and may condemn structural work as failing to conform to the Contract Documents. The Project Representative shall have authority to act on behalf of the Town only to the extent expressly delegated by the Town, which shall be shown to the Contractor, and shall have authority to stop the work whenever such stoppage may reasonably be necessary to insure the proper execution of the Contract.

12.2. In connection with the work, the Project Representative shall not be responsible for construction methods, means, techniques, sequences or procedures employed by the Contractor or the Contractor's safety programs, requirements, regulations, or precautions.

13. Decisions of the Project Representative

13.1. The Project Representative shall, within a reasonable time, make decisions on all claims of the Town or the Contractor and on all other matters relating to the execution and progress of the structural work or the interpretation of the Contract Documents.

13.2. The Project Representative's decision, in matters relating to the project, shall be final, if within the terms of the Contract Documents.

13.3. If, however, the Project Representative fails to render a decision within ten days after the parties have presented their evidence, either party may then avail itself of the remedies provided in this contract or available to it by law. If the Project Representative renders a decision after such remedies have commenced, such decision may be entered as evidence but shall not disturb or interrupt such proceedings except where such decision is acceptable to the parties concerned.

14.1 Use of Premises by the Contractor:

14.1. The Contractor shall confine its apparatus, the storage of materials and the operations of its workmen to limits indicated by law, by-laws, permits or directions of the Town and shall not unreasonably encumber the premises with its materials.

14.2. The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

15. Maintenance of Premises:

The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by its employees or work, and at the completion of the work it shall remove all its rubbish from and about the work site and all its tools, scaffolding and surplus materials and shall leave its work "broom-clean", or its equivalent, unless more exactly specified. In case of dispute, the Town may remove the rubbish and charge the cost to the several contractors, as the Town shall determine to be just.

16. Right to Terminate

If the Contractor should (1) be adjudged a bankrupt, (2) make a general assignment for the benefit of creditors, (3) have a receiver appointed on account of its insolvency, (4) persistently or repeatedly refuse or fail to supply enough personnel and resources to perform the contract, (5) fail to make prompt payment to subcontractors or to providers of materials or labor, (6) persistently disregard laws and regulations or lawful directives of the Town, or (7) be guilty of a substantial violation of any provision of the Contract, then the Town may, without prejudice to any other right or remedy and after giving the Contractor (or any surety) seven days written notice, terminate the contract and the employment of the Contractor and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method it deems appropriate.

In such cases, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid amount owed to the Contractor for work already completed shall exceed the expense of finishing the work, including compensation for additional architectural, managerial, legal and administrative services, such excess shall be paid to the Contractor. If such expenses shall exceed such unpaid balances, the Contractor shall pay the difference to the Town.

The Contractor shall not be relieved of liability to the Town by virtue of any termination of this contract, and any claim for damages against the Contractor relating to the Contractor's performance under this contract shall survive any termination hereunder.

Notwithstanding any other provision of this Agreement, the Town reserves the right at any time in its absolute discretion to suspend or terminate this Agreement in whole or in part for its convenience upon seven days written notice to the Contractor. The Town shall incur no liability by reason of such termination except for the obligation to pay compensation for all work performed by the Contractor and accepted by the Town to the termination date.

17. Progress Payments:

17.1. The Contractor shall submit to the Town an itemized Application for Payment, supported to the extent required by the Town by invoices or other vouchers, showing payments for materials and labor, payments to Subcontractors and such other evidence of the Contractor's right to payment.

17.2. The Contractor shall, before the first application, submit to the Town a schedule of values of the various parts of the work, including quantities aggregating the total sum of the Contract, divided so as to facilitate payments to Subcontractors, made out in such form as the Town and the Contractor may agree upon, and, if required, supported by such evidence as to its correctness. This schedule, when approved by the Town, shall be used as a basis for payment, unless it is found to be in error. If applying for payments, the Contractor shall submit a statement based upon this schedule.

18. Withholding of Payments

18.1. The Town may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any payment to such extent as may be necessary in its reasonable opinion to protect the Town of North Andover from loss on account of:

18.1.1. Defective work not remedied.

18.1.2. Claims filed or reasonable evidence indicating probable filing of claims.

18.1.3. Failure of the Contractor to make payments properly to Subcontractors or for material or labor.

18.1.4. A reasonable doubt that the Contract can be completed for the balance then unpaid.

18.1.5. Damage to another contractor.

18.1.6. Delays resulting in liquidated damages.

18.2. Withholding of payments shall be in strict compliance with statutory requirements.

19. Claims by Contractor and Liability of Town

All claims by the Contractor against the Town shall, unless otherwise provided by law, be initiated by a written claim submitted to the Town no later than seven (7) calendar days after the event or the first appearance of the circumstances causing the claim. The claim shall set forth in detail all known facts and circumstances supporting the claim. The Contractor shall continue its performance under this contract regardless of the submission or existence of any claims.

The limit of liability of the Town under this Agreement is limited to the compensation provided herein for work actually performed, and shall in no event include liability for delays or for incidental, special or consequential damages or lost profits or for damages or loss from causes beyond the Town's reasonable control.

20. Liquidated Damages:

Because both parties recognize (1) that the time for completion of this Contract is of the essence, (2) that the Town will suffer loss if the work is not completed within the contract time specified, plus any extension thereof allowed in accordance with the provisions of this contract, and (3) the delays, expense and difficulties involved in a legal proceeding to determine the actual loss suffered by the Town if the work is not completed in time, it is agreed that the Contractor will pay the Town as liquidated damages representing an estimate of delay damages, not as a penalty, the sum of One Thousand Dollars ($1,000) per day for each calendar day of delay until the work is completed, whether the work is completed by the Contractor or some other person. The Town's right to impose liquidated damages shall in no way prohibit or restrict the Town's right to bring a legal action for damages in lieu of or in addition to its option to impose liquidated damages. The Town may deduct any liquidated damages from money due the Contractor, and if such payment is insufficient to cover the liquidated damages, then the Contractor shall pay the amount due.

21. The Contractors' Mutual Responsibility:

Should the Contractor cause damage to any separate subcontractor on the work, the Contractor agrees, upon due notice, to settle with such contractor by agreement, or by recourse to remedies provided by law or by the provisions of the contract. If such separate contractor sues the Town on account of any damage alleged to have been sustained, the Town shall notify the Contractor, who shall defend such proceedings at the Town's expense and, if any judgment against the Town arises therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Town.

22. Separate Contracts:

22.1. The Town reserves the right to let other Contracts in connection with this work under similar General Conditions. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate its work with theirs.

22.2. If any part of the Contractor's work depends, for proper execution or results, upon the work of any other contractor, the Contractor shall inspect and promptly report to the Town any defects in such work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute an acceptance

of the other contractor's work as fit and proper for the reception of its work except as to defects which may develop in the other contractor's work after the execution of its work.

22.3. To insure the proper execution of its subsequent work, the Contractor shall measure work already in place and shall at once report to the Town any discrepancy between the executed work and the Drawings.

23. Subcontracts:

23.1. All Subcontracts shall be awarded in conformity with the requirements of the General Laws, Commonwealth of Massachusetts, Chapter 149, Sections 44A to 44L, inclusive.

23.2. The Contractor agrees that it is as fully responsible to the Town for the acts and omissions of its Subcontractors and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

23.3. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the Town.

24. Contractor-Subcontractor Relations:

The Contractor agrees to bind every Subcontractor and every Subcontractor agrees to be bound by the terms of the Agreement, the General Conditions of the Contract, the Supplementary General Conditions, the Drawings and Specifications, as far as applicable to its work, including the provisions of the General Laws, Commonwealth of Massachusetts, Chapter 149, Section 44A, et seq.

25. Indemnification:

25.1. The Contractor shall indemnify, defend and save harmless the Town, its officers, agents and employees from and against any and all damages, liabilities, actions, suits, proceedings, claims, demands, losses, recoveries and judgments of every nature and description (including reasonable attorneys' fees) brought or recovered against them that may arise in whole or in part out of or in connection with the work being performed or to be performed, or out of any act or omission by the Contractor, its employees, agents, subcontractors, material men, and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by any party indemnified hereunder. The Contractor further agrees to reimburse the Town for damage to its property caused by Contractor, its employees, agents, subcontractors or material men, and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, including damages caused by his, its or their use of faulty, defective or unsuitable material or equipment, unless the damage is caused by the Town's gross negligence or willful misconduct. The existence of insurance shall in no way limit the scope of the Contractor's indemnification under this Contract.

25.2. In any and all claims against the Town or any of their agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or

any Subcontractor under Workmen's Compensation Acts, disability benefit acts or other employee benefit acts.

25.3. The intent of the Specifications regarding insurance is to specify minimum coverage and minimum limits of liability acceptable under the Contract. However, it shall be the Contractor's responsibility to purchase and maintain insurance of such character and in such amounts as will adequately protect it and the Town from and against all claims, damages, losses and expenses resulting from exposure to any casualty liability in the performance of the Work.

26. The Contractor's Insurance:

26.1. The Contractor shall purchase and maintain such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

26.1.1. Claims under Worker's Compensation, disability benefit and other similar employee benefit acts;

26.1.2. Claims for damages because of bodily injury, occupational sickness or disease, or death of its employees, and claims insured by usual personal injury liability coverage;

26.1.3. Claims for damage because of bodily injury, sickness or disease, or death of any person other than its employees, and claims insured by usual personal liability coverage;

26.1.4. Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

26.2. The insurance required by the above shall be written for not less than the following minimum limits of liability:

26.2.1. Worker's Compensation Insurance Requirements

Workers' Compensation coverage as required by the laws of the Commonwealth of Massachusetts.

26.2.2. Liability Insurance Requirements

Liability insurance shall include all major divisions and shall be on a comprehensive general basis including Premises and Operations, Owners and Contractor's Protective, Products and Completed Operations, and Owned, Non-owned and Hired Motor Vehicles. All such insurance shall be written for not less than any limits of liability required by law, unless otherwise provided in the contract documents, or the following limits, whichever are greater:

Comprehensive General Liability Insurance (Broad Form)

Bodily Injury	$1,000,000 per person $2,000,000 aggregate
Property Damage	$1,000,000 per occurrence $2,000,000 aggregate
Automobile Liability Insurance	$500,000 per person $1,000,000 per occurrence
Excess Liability (Umbrella)	$10,000,000
Excess Liability (Umbrella –Subcontractors)	$1,000,000 or 1.5 times the value of the subcontract, whichever is higher

26.3. The above insurance policies shall also be subject to the following requirements:

26.3.1. Insurance coverage for the Contractor's Comprehensive General Liability, as hereinafter specified under Paragraph entitled "Protective Liability Insurance" shall be written by one and the same insurance company to avoid the expense of duplicate and/or overlapping coverage and to facilitate and expedite the settlement of claims.

26.3.2. Certificates of Insurance acceptable to the Town shall be addressed to and filed with the Town prior to commencement of the work. Renewal certificates shall be addressed to and filed with the Town at least ten (10) days prior to the expiration date of required policies.

26.3.3. No insurance coverage shall be subject to cancellation without at least thirty (30) days prior written notice forwarded by registered or certified mail to the Town. The Town shall also be notified of the attachment of any restrictive amendments to the policies.

26.3.4. All Certificates of Insurance shall be on the "MIIA" or "ACORD" Certificate of Insurance form, shall contain true transcripts from the policies, authenticated by the proper officer of the Insurer, evidencing in particular those insured, the extent of coverage, the location and operations to which the insurance applies, the expiration date and the above-mentioned notice clauses.

26.3.5. All premium costs shall be included in the Contractor's bid.

26.3.6. All insurance shall be written on an occurrence basis. Coverage shall be maintained without interruption from date of the Contract until date of final payment and termination of any coverage required to be maintained after payment.

27. Protective Liability Insurance:

27.1. The Contractor shall purchase and maintain such insurance as described in the preceding paragraph as will protect the Town from claims which may arise from operations under the Contract, including operations performed for the named insureds by independent contractors and general inspection thereof by the named insureds.

27.2. The Contractor shall also purchase and maintain such insurance as will protect the Town against Automobile Non-Ownership Liability in connection with the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

27.3. The limits of liability for coverage required under the preceding paragraphs shall be as specified under the provisions hereof governing the Contractor's General Liability Policy.

27.4. The Town shall be named as an additional insured on the above referenced liability Policies, and the Contractor's insurance shall be the primary coverage. The cost of such insurance, including required endorsements and amendments, shall be the sole responsibility of the Contractor.

28. Liens:

Neither the Final Payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the Town a complete release of all liens arising out of the Contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that as far as it has knowledge or information, the releases and receipts include all the labor and material for which a lien could be filed. The Contractor shall comply with all statutory provisions of the General Laws of the Commonwealth of Massachusetts with regard to liens, Chapter 254 and 149 as amended (as a minimum requirement).

29. Guarantees:

29.1. The Contractor guarantees and warrants to the Town that all labor furnished under this Contract will be competent to perform the tasks undertaken, that the product of such labor will yield only first-class results, that materials and equipment furnished will be of good quality and new unless otherwise permitted by this Contract, and that the Work will be of good quality, free from faults and defects and in strict conformance with this Contract. All Work not conforming to these requirements may be considered defective.

29.2. If at any time any part of the work constructed under the terms of this contract shall in the opinion of the Town Manager require repairing due to defective work or materials furnished by the Contractor, he may notify the Contractor in writing to make the required repairs. If the Contractor shall neglect to start such repairs within ten days of the date of giving it notice thereof and to complete the same to the satisfaction of the Town Manager with reasonable dispatch, then the latter may employ other persons to make such repairs. The Town shall charge the expense thereof to the Contractor and may use any moneys still retained to pay for the same, and if such sum is insufficient, the Contractor shall be obligated to pay the balance thereof.

29.3. All guarantees and warranties required in the various Sections of the Specifications which originate with a Subcontractor or Manufacturer must be delivered to the Town before final payment to the Contractor may be made for the amount of that subtrade or for the phase of work to which the guarantee or warranty relates. The failure to deliver a required guarantee or warranty shall be held to constitute a failure of the Subcontractor to fully complete his work in accordance with the Contract Documents. The Contractor's obligation to correct work is in addition to, and not in substitution of, such guarantees or warranties as may be required in the various Sections of the Specifications.

This Agreement is intended to take effect as a sealed instrument. Witness our hands and seals hereto:

Dated: _____

The Contractor by: _____
Authorized Signature

The Town of North Andover by: _____
Town Manager

_____
Department/Division Head

_____
Town Counsel
Approved as to Form

_____
Town Accountant
Certified as to Appropriation

CONDITIONS OF THE CONTRACT

1.01 For the purposes of these Conditions of the Contract, the Proposer awarded the contract is referred to as the Contractor. The Contractor, before submitting a proposal, shall examine carefully, the conditions relative to the contract under which the work is to be performed, the site of the work and the RFP Documents. The Awarding Authority will not be responsible for errors, omissions and/or charges for extra work arising from the Contractor's failure to familiarize him/herself with the requirements of the RFP or existing site conditions. Submissions of a proposal for the work shall represent that the Contractor has satisfied him/herself as to the conditions to be encountered, and the labor, materials and equipment required for the performance of work under this Contract.

A. Design: The Contractor shall be responsible for the design and engineering required for the fabricating and their delivery, and installation at the specified project site, including, but not limited to, Site, Civil, Architectural, Structural, Mechanical and Electrical designs. Designs shall conform to Massachusetts State codes and all Government regulations. All final plans shall bear the seal of a registered Professional Engineer licensed in the State of Massachusetts.

B. Design approvals: Engineering plans shall be submitted by the Contractor to the Architect for review before the work is performed. No representation or approval by the Awarding Authority shall release the Contractor from its responsibility to conform to all applicable codes and all government regulations governing the construction or its conformance to the RFP Documents. All material shall receive written approval from the Architect through submittal reviews before being delivered and/or installed on site. The Contractor shall allow a fourteen (14) calendar day review period or mutually agreed upon schedule for all submittals requiring approval.

C. Supervision: The Contractor shall maintain a Massachusetts licensed construction supervisor for supervision adequate to insure its conformance to the codes and all government regulations and specifications during all phases of construction at construction site. All on-site work shall progress under the direct supervision of the Contractor's on-site supervisor. Verification of field dimensions shall be the responsibility of the Contractor.

D. Warranties: Unless specified by a manufacturer's warranty of greater duration as required by this RFP, the Contractor shall warrant the work to be free from defects in workmanship or materials for 1 year from the date of substantial completion. The Contractor shall replace or repair defects discovered during this warranty period at no cost to the Awarding Authority.

E. Existing Conditions: Documentation of existing conditions with photographs will be performed by the Awarding Authority prior to the Contractor's mobilization on the site. The existing conditions photographic record will be mutually agreed to by both parties and signed off by the Contractor.

1.03 WORK EXECUTION REQUIREMENTS:

A. Unless otherwise specified, the Contractor shall provide and pay for all materials, labor, tools, equipment, transportation, fuel, weather protection and other facilities necessary for the execution and completion of the work.

B. Unless otherwise specified, all materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials. Notwithstanding, he Awarding Authority and Contractor recognize that a significant portion of the work relates to disassembling, transporting and re-assembling existing modular buildings.

C. The Contractor shall, at all times, enforce strict discipline and good order among its employees and shall not employ, on the work, any disorderly person or anyone not skilled in the work assigned to them.

D. All manufactured articles, material, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the manufacturer's directions and instructions unless otherwise indicated in the Contract Documents.

E. The Contractor shall sequence the work and maintain the limit of work in such a manner to maintain the existing buildings egress systems at all times during the duration of construction until the time of modular building acceptance.

F. The Contractor shall adhere to the local Work Day restriction By-Laws. Additionally there shall be no deliveries before 7:00 AM or after 7:00 PM.

G. Contractor toilet facilities. Contractor shall be responsible for providing portable/temporary toilet facilities located within the limit of work. Contractors will not have access to toilet facilities in the existing school building at any time.

1.04 PERMITS AND REGULATIONS:

A. The Awarding Authority anticipates that the fee will be waived for the building Permit.

B. Applicable permits, licenses and inspections necessary for the execution of the work shall be secured and paid for by the Contractor.

C. This Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as specified. If the Contractor observes that the specifications are at variance therewith, it shall promptly notify the Architect in writing and any necessary changes shall be adjusted as provided in the contract for changes in the work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, it shall bear all costs arising there from.

D. All permits and fees required for surveys, escorts, transportation, fire watches, traffic control details and inspections shall be paid for by the Contractor.

E. This Contractor shall acquire a large structure moving permit from the Town of North Andover. The Application to Move a Structure (including manufactured and modular buildings) is issued by the Town of North Andover Inspectional Services Division.

F. Site Working Hours shall be as follows:
Monday through Friday: 7am - 7pm
Saturday and Sunday: Prior to scheduling any work, the Police Department must be contacted for permission.

G. Overall schedule for work on site while school is in operation shall be subject to coordination with the E.C.C. events schedule.

H. Site Contractor shall be selected from the Town of North Andover approved contractor list. The Modular Contractor shall coordinate with the Town of North Andover. This Contractor shall contact the Town Engineer for list of approved site contractors.

I. All water gate operation must be performed through the town department. Permits are required from the engineering department and the work shall be coordinated with the Water/Sewer department.

1.05 PROTECTION:

A. This construction will be undertaken within the grounds of a fully occupied pre-kindergarten school. The Contractor shall maintain safety barriers, fencing, protection and operations as required by law, to protect the students, faculty, other building occupants and general public from danger and harm during the construction.

B. The Contractor shall continuously maintain adequate protection of all its work, including the modular units, from damage or loss; and shall protect the adjacent public and private properties from damage or loss arising in connection with the contract. It shall make good any such damage, injury or loss. The Contractor shall adequately protect adjacent property as provided by law and the Contract Documents.

C. The Contractor shall take all necessary precautions for the safety of employees on the work site and shall comply with all applicable provisions of federal, state and local safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. It shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of the public and workers, and shall post danger signs warning against the hazards created by such features of construction as pits, protruding nails, hoists, well holes, scaffolding, openings, elevation changes, and falling materials; and it shall designate a responsible member of its organization on the work, whose duty shall be the prevention of accidents. The name and position of any person so designated shall be reported to the Awarding Authority by the Contractor.

D. The Contractor shall take all reasonable precautions for the safety of and shall provide all reasonable protection to prevent damage, injury or loss to all of the work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of its subcontractors as well as other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation, or replacement in the course of construction.

E. In the event of temporary suspension of work, or during inclement weather, or whenever the Awarding Authority shall direct, the Contractor shall protect, and shall cause its subcontractors to carefully protect the Contractor's and subcontractor's work and materials against damage or injury from weather. If, in the opinion of the Awarding Authority, any work or material shall have been damaged or injured by reason of failure on the part of the Contractor or any of its subcontractors so to protect the work, such materials shall be removed and replaced at the expense of the Contractor and at no cost to the Awarding Authority.

F. In an emergency affecting the safety of life or of the work or of adjoining property, the Contractor is hereby permitted to act at its discretion, to prevent such threatened loss or injury; and it shall so act, without appeal, if so authorized or instructed.

1.06 ACCESS TO WORK AND TESTING:

A. The Awarding Authority and its representatives shall have access to the construction areas to observe the work at such times so as not to impede the progress of the work or increase any risk to the Contractor.

B. If the Contract Documents, State requirements, the Awarding Authority's instructions, laws, ordinances, or any public authority requires work to be specifically tested or inspected, the Contractor shall give the Awarding Authority timely notice of its readiness for such inspection or testing by the Awarding Authority or its agent. If any work should be covered up without written approval or consent of the Awarding Authority, it must be uncovered for examination at the Contractor's expense.

1.07 SUPERINTENDENCE AND SUPERVISION BY CONTRACTOR:

A. During the progress of the work, the Contractor shall keep, on site, a competent superintendent, having a Massachusetts Construction Supervisors License, and any necessary assistants, all satisfactory to the Awarding Authority. The superintendent shall not be changed except with the written consent of the Awarding Authority, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in its employ. The superintendent shall represent the Contractor and all directions given to him shall be as binding as if given to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case.

B. The Contractor shall give efficient supervision to the work, using its best skill and attention. It shall carefully study all plans and specifications and other instructions and shall at once report to the Awarding Authority any error, inconsistency, or omission which it may discover.

C. The Contractor shall supervise work performed by himself and his subcontractors. In addition, the superintendent shall remain on duty whenever site is active and until all the work under this contract is fully completed, including all items appearing on the list of incomplete and/or corrective work issued at the time of final inspection.

D. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the work under the contract and shall use best efforts not to interfere with the activities of the surrounding area. No work within the wetlands buffer zone is allowed.

E. The Contractor shall be responsible to the Awarding Authority for the acts and omissions of its employees, subcontractors, and their agents and employees, and other persons performing or supplying any of the work.

F. The Contractor shall not be relieved from its obligations to perform the work in accordance with the Contract Documents either by the activities or duties of the Awarding Authority in the administration of the contract, or by inspections, tests, or approvals required or performed by persons other than the Contractor pursuant to the Contract Documents or applicable statutes or ordinances.

G. Unless otherwise provided in the Contract Documents, the Contractor shall provide, install, connect, and pay for all labor, materials, equipment, tools, construction equipment, machinery, utilities, transportation, and other facilities and services necessary for the proper execution of the work, whether temporary or permanent and whether or not incorporated or to be incorporated into the work. The contractor will be responsible for all costs associated with weather conditions.

1.08 CHANGES IN THE WORK:

A. The Awarding Authority may order extra work or make changes by altering, adding to, or deducting from the work, the contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract except that any request for extension of time caused thereby shall be made by the Contractor in writing at the time of ordering such change.

B. A change order is a written order to the Contractor signed by the Awarding Authority, issued after execution of the contract, authorizing a change in the work or an adjustment in contract sum or time of completion. The contract time and time of completion may be changed only by change order. A change order signed by the Contractor indicates its agreement therewith, including the adjustment in contract sum or in the change of the time of completion.

C. In giving instructions, the Awarding Authority and /or the Architect shall have the authority to make minor changes in the work, not involving extra cost, and not inconsistent with the purpose of the project, but otherwise except in an emergency endangering life or property, no extra work or change shall be authorized unless in pursuance of a written order from the Awarding Authority.

1.09 CONSTRUCTION CHANGE DIRECTIVE:

A. A Construction Change Directive (CCD) shall be issued in the absence of total agreement on the terms of a Change Order.

B. If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on Lump Sum, Time and Materials, or Unit Price as determined by the Town.

C. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Awarding Authority and the Architect in writing of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

D. A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith including adjustments in Contract Sum and Contract Time and with the method of determining them. Such agreement shall be effective immediately and shall be considered a Change Order.

1.10 WORK PERFORMED UNDER PROTEST:

A. In the event the Awarding Authority and the Contractor can not agree to the amount of a Change Order, or in a Construction Change Directive, or if the Contractor performs certain work that it considers a change in the contract but Awarding Authority considers the Work to be part of the Contract, the Contractor shall proceed to perform the Work in question and keep time and materials records and submit those records daily to the Awarding Authority. Failure to submit those records shall result in a forfeiture of any claim and extinguish any claim. At the conclusion of such Work the contractor shall submit a change order request to the Awarding Authority and the Architect for consideration. All rulings by the Awarding Authority will be final.

1.11 CORRECTION OF WORK:

A. The Contractor shall promptly remove from the premises all work condemned or rejected by the Building Department or Awarding Authority for failing to conform to the Contract Documents, and the Contractor shall promptly replace and re-execute its own work in accordance with the Contract Documents and without additional expense to the Awarding Authority and shall bear the expense of making good all work of subcontractors destroyed or

damaged by such removal or replacement. All quality control decisions by the Awarding Authority will be final.

B. The Contractor shall remedy, in or within 5 days or other schedule reached by mutual consent with the Awarding Authority, any defects due to material or workmanship and pay for any damage to other work resulting therefrom. The Awarding Authority shall give notice in writing of observed defects with reasonable promptness.

1.12 RIGHT OF AWARDING AUTHORITY TO PERFORM WORK:

A. If the Contractor should neglect to execute the work properly or fail to perform any provision of the contract, the Awarding Authority, after five (5) days written notice to the Contractor, may, without prejudice to any other remedy, have others perform the work in question and may deduct the cost thereof from the payment then or thereafter due the Contractor.

B. This Contractor shall work in cooperation with the Owner's Separate Contractors that will be performing the site work package which will include but not be limited to, utilities, paving, curbing, walkways, grading, seeding and landscaping that generally falls 10’ outside the addition footprint. The Awarding Authority shall also be performing a limited amount of interior renovation work in the existing E.C.C. and some IT, security and phone / PA installation in the new addition.

1.13 RIGHT OF AWARDING AUTHORITY TO TERMINATE CONTRACT

A. If a petition is filed by the Contractor, or against the Contractor with its consent, under any federal or state law concerning bankruptcy, reorganization, insolvency, or relief from creditors, or if such petition is filed against the Contractor without its consent and is not dismissed within sixty (60) days, or if the Contractor is generally not paying its debts as they become due, or if the Contractor becomes insolvent, or if the Contractor consents to the appointment of a receiver, trustee, liquidator, custodian, or the like and if such appointment is not terminated within sixty (60) days, or if the Contractor makes an assignment for the benefit of creditors, or if the Contractor refuses or fails, except in cases for which it is entitled to an extension, to supply enough properly skilled workmen or proper materials to maintain the construction schedule, or if it fails to make prompt payment to a subcontractor, or disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction or otherwise is responsible for a substantial violation of any provision of the contract documents, then the Awarding Authority, without prejudice to any right or remedy, and after giving the Contractor seven (7) days written notice, may terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment, and machinery thereon owned by the Contractor and may finish the work by whatever method it may deem expedient. In such cases, the Contractor shall not be entitled to receive any further payment until the work is finished.

B. In case of termination of the Contract, pursuant to paragraph above, the Awarding Authority may, at its election (but is under no obligation to), assume and become liable for the obligation, commitments, and unsettled claims the Contractor has previously undertaken and incurred in

good faith in connection with said work. Should the Awarding Authority so elect, the Contractor shall execute and deliver an assignment of its contractual rights as the Awarding Authority may require, for the purpose of fully vesting in the Awarding Authority, the rights and benefits of the Contractor under such obligations or commitments.

C. TERMINATION FOR CONVENIENCE

1. The Awarding Authority may terminate this contract, with or without cause, for convenience, even though the Contractor is not in default, by giving notice to the Contractor specifying in said notice the date of termination. (1) all sums due and owing under this Contract through the date of termination, including any retainage withheld to the date of termination; (2) a reasonable sum to cover expenses which the Contractor incurs during demobilization of the project.

2. Lost profits shall not be payable. The payment provided in paragraph above shall be considered to fully compensate the Contractor for all claims and expenses and those of any engineers, subcontractors and suppliers, directly or indirectly, with or without cause, attributable to the termination.

3. Contractors Duties Upon Termination for Convenience:

a. Upon termination of this contract for convenience as provided in this Section 1.13, the Contractor shall (1) stop the work; (2) stop placing orders and subcontracts in connection with this contract; (3) cancel all existing orders and subcontracts; (4) surrender the site to the Awarding Authority in a safe condition; (5) transfer to the Awarding Authority, all materials, supplies, work in process, appliances, facilities, equipment and machinery of this contract, and all plans, drawings, specifications and other information and documents used in connection with this contract.

1.14 DAMAGES:

A. Should either party to this Contract suffer damages because of any wrongful act or neglect or omission of the other party or anyone employed by it, claims shall be made in writing to the party liable within 21 days of the first observance of such damage and not later that the final payment, except in the case of subsequently discovered defective work or materials.

B. In the event the Awarding Authority receives a third party demand for direct payment. The Awarding Authority shall take all measures consistent with advice offered form the Awarding Authority's legal counsel. The Contractor shall bear all of the Awarding Authority's costs associated with administering demands for direct payment (including but not limited to reasonable legal fees and architectural services).

1.15 ASSIGNMENT OR SUB-LETTING AS A WHOLE:

A. Neither party to the contract shall assign the contract or sub-let it as a whole without the written consent of the other party, nor shall the Contractor assign any monies due or to become due to it hereunder, without the previous written consent of the Awarding Authority.

1.16 SUB-CONTRACTS:

A. The Contractor agrees that it is as fully responsible to the Awarding Authority for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

B. Nothing contained in the Contract Documents shall create any contractual relation between any subcontractor and the Awarding Authority.

1.17 QUALITY OF MATERIALS:

A. Where the name of an item, material, or manufacturer is mentioned in the specifications or on the drawings, the intent is to establish a standard and in no way should be construed to exclude any item or manufacturer not mentioned by name, but whose product meets the specifications as to design, utility, and quality. Final decision shall rest with the Awarding Authority as to its acceptability (see MGL c. 30, §39M). All decisions of the Awarding Authority shall be final.

B. Where more than one name of an item, material, or manufacturer is mentioned in the specifications, the Contractor shall have the right to use any one so named without further written approval as to design, utility and quality.

1.18 PERFORMANCE, LABOR & MATERIALS PAYMENT BONDS:

A. Before contract signing, the Contractor shall furnish the Awarding Authority with a Performance Bond and a Labor and Materials Payment bond, in a form acceptable to the Awarding Authority, each in the amount of one hundred percent (100%) of the contract price, to insure completion of the work and payment for all labor and materials furnished on the project.

1.19 CONTRACTOR'S LIABILITY INSURANCE:

A. Insurance: The Contractor, at no additional cost to the Awarding Authority, shall purchase and maintain such insurance as will protect him/herself, the Awarding Authority, that may arise out of or result from the Contractor's operations, whether such operations are performed by the Contractor or by any subcontractors or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Such insurance shall provide coverage of the type and in the amounts specified below. The Town of North Andover and Architect shall be listed as an additional insured on all applicable policies for the life of the project. The Insurance Carrier should be rated A or better and must be licensed in the State of Massachusetts.

B. To the extent permitted by law, the Contractor shall provide the Awarding Authority with insurance certificates showing required insurances and expiration dates before the start of any work.

1. Claims under Worker's Compensation, disability benefit, and other similar employee benefits acts.

2. Claims for damages because of bodily injury, occupational sickness, disease, or death of its employees, and claims insured by usual personal injury liability coverage.

3. Claims for damage because of bodily injury, sickness, or disease, or death of any person other than employees, and claims insured by usual injury liability coverage.

4. Claims for damages because of injury to or destruction of tangible property, including loss of use resulting there from.

C. The Insurance required shall be written by an Insurance carrier rated A or better and must be licensed in the State of Massachusetts, and for not less than the following minimum limits of liability.

1. Worker's Compensation: Statutory Employers' Liability:
   $500,000 each accident
   $500,000 Disease-policy limit
   $500,000 Disease-each employee

2. Comprehensive General Liability:
   Each Person/Each Occurrence: Bodily Injury
   $1,000,000/$2,000,000
   Each Occurrence/Aggregate: $1,000,000/$2,000,000

   a. Excess liability: (Umbrella Form) at least $5,000,000.

   b. The Comprehensive General Liability Insurance Policy (Broad Form) shall include coverage for Premises Operations, Independent Contractors, Products-Completed Operations, $2,000,000 liability for damage to property by explosion, by collapse of adjoining structures, and for damage to underground pipes and utilities caused by digging with mechanical equipment. $2,000,000

   c. General Liability Insurance should be on an occurrence form with limits of:
   $2,000,000 General Aggregate
   $2,000,000 Products & Completed Operations Aggregate
   $1,000,000 Personal & Advertising Injury
   $1,000,000 Each Occurrence
   $50,000 Damage to Rented Premises (each occurrence)
   $5,000 Medical Expenses (any one person)

3. Comprehensive Automobile Liability:
   Each person/Each Occurrence: Bodily Injury
   $1,000,000/$1,000,000
   Each Occurrence/Aggregate: Property Damage

   a. The Comprehensive Automobile Liability Insurance Policy shall be written to include Owned, Hired, and Non-owned vehicles and it shall provide Extra Territorial Coverage.

4. Builders Risk Insurance (to be carried by the contractor) $10,000.00 Deductible. Contractor's insurance shall completely cover any damage to the modular units when they during their transportation to the project site, and during their erection at the project site. The Contractor's insurance shall cover damage to the units, up to the replacement value of a damaged unit. Any cancellation the Awarding Authority has the right to purchase the insurance and deduct the cost from the Contract Sum.

5. Professional Liability Insurance: the engineer engaged by the Contactor for preparing design and engineering plans shall carry professional liability insurance in amounts no less than $1.0M / $2.0M.

D. The above insurance policies shall also be subject to the following requirements:
   1. Certificates of insurance acceptable to the Awarding Authority shall be addressed to and filed with the Awarding Authority prior to the commencement of the work. Renewal certificates shall be addressed to and filed with all parties at least thirty (30) days prior to the expiration date of the required policies.

   2. No insurance coverage shall be subject to cancellation without at least thirty (30) days prior written notice forwarded by registered or certified mail to the Awarding Authority. Both parties shall also be notified of the attachment of any restrictive amendments to the policies.

   3. All premium costs shall be included in the Contract Price.

1.20 CONTRACTOR'S CONTRACTUAL LIABILITY:

A. The Contractor hereby assumes the entire responsibility and liability for any and all injury to or death of any and all persons, including the Contractor's employees, and for and all damage to property cause by, resulting from, or arising out of any act, omission, or neglect on the part of the Contractor or of any subcontractors or of anyone directly or indirectly employed by any one of them, or of anyone for whose acts any one of them may be liable in connection with operations under the contract.

B. The Contractor further agrees to indemnify and hold harmless the Awarding Authority, the Architect, their consultants, employees, agents, and representatives, from and against, all claims, all damages, losses and expenses, including attorney's fees, arising out of or resulting from the performance of the work.

1.21 PREVAILING WAGE RATE:

A. The Contractor shall require that all workers be paid the prevailing wage rates for on site work, including but not limited to, dismantling, excavation, foundation construction, utility connections, installation, site restoration and finish of the modular units, and any assembly performed within Massachusetts. A copy of the applicable rates is included in the RFP Documents.

1.22 KNOWLEDGE OF AND COMPLIANCE WITH LAWS, ETC.:

A. The Contractor shall keep itself fully informed of all state and federal laws and local bylaws, ordinances, rules and regulations and of all orders, decrees of any bodies or tribunals having jurisdiction in any manner affecting those engaged or employed in the work, of the materials used in the work, or in any way affecting the conduct of the work. If any discrepancy or inconsistency is discovered in the Contract Documents for this work to be in violation of any such law, by-law, ordinance, rule, regulation, order or decree, the Contractor shall forthwith report the same in writing to the Awarding Authority. The Contractor shall, at all times, observe and comply with and shall cause all its agents, employees and subcontractors to observe and comply with all such laws, by-laws, ordinances, rules, regulations, orders and decrees; and shall protect and indemnify the Awarding Authority, Architect, and their consultants, agents and employees against any claim or liability arising from or based on any violation of any such law, by-law, ordinance, rule, regulation, order or decree.

1.23 NOTICE:

A. Any notice required by any of the contract documents shall be provided by registered mail or delivery as follows:
TOWN OF NORTH ANDOVER
Town Hall
120 Main Street
North Andover, MA 01845
Attention: Mr. Ray Santilli

1.24 THE CONTRACT DOCUMENTS:

A. The Contract Documents shall be comprised of the Request for Proposals documents (including the General Conditions and the Performance Specifications), all Forms, Addenda, the Proposal submitted by the Contractor as accepted by the Awarding Authority, and the Contract Agreement executed by the Awarding Authority and Contractor.

1.25 TIME:

A. Time is of the essence of this Contract. Within 7 days after award of the contract, the Contractor shall provide a schedule, in a form that is acceptable to the Awarding Authority, for performance of the work for review and approval by the Awarding Authority, which meets the Project Schedule for completion as required in the Request for Proposals.

B. In the event the Contractor fails to substantially complete the work and turn over the work to the Awarding Authority by the date specified in the Project Schedule, the Awarding Authority may assess liquidated damages against the Contractor in the amount of actual costs incurred by the Awarding Authority per day, for each day after the specified date that the Contractor fails to turn over the work for the use and occupancy of the Awarding Authority. Such liquidated damages may include, but are not limited to, damages associated with delay in commencement of the modular kindergarten classroom addition to the E.C.C.

C. In the event the Awarding Authority approves a contract time extension to the Contractor for a change in work as provided in Changes in the Work or Construction Change Directives, the contract time extension shall be considered the sole compensation to which the Contractor is entitled as a result of any delays to the contract completion date, The Contractor shall not be entitled to any additional compensation related to the contract time extensions.

1.26 SCHOOL PROJECT – NO CONTACT WITH STUDENTS AND CORI REPORTING:

A. The Contractor shall ensure that all the workers on the project shall not intermingle with the student population or otherwise enter Awarding Authority-owned premises at the School that occupy portion of this site except with the knowledge and written approval of the Awarding Authority. The principal at the School shall have the ability to immediately stop work in a Awarding Authority-occupied area in the event such work has not been authorized in advance, or is being performed in a manner that threatens the safety of the building occupants, the building structure, or otherwise interferes with the school's educational program. The Awarding Authority's decisions in this matter are final.

B. CORI REPORTING: In accordance with MGL c.71, s.38R, Criminal Offender Record Information (CORI) from the criminal history systems board will be required, relating to any worker who is scheduled to work at the School site, within areas of the school occupied by students, or in areas where students otherwise have access. The Contractor and its subcontractors shall make every effort to notify the Awarding Authority at least two (2) weeks before any worker may be working in areas of the school occupied by students. The General Contractor will be notified of any worker who will not be allowed to work on the project, as a result of the CORI check. The Awarding Authority reserves the right to stop work if there has been a failure to comply with this requirement, in which event, the Contractor and subcontractors shall have no claim for damages, delays or time extensions against the Awarding Authority.

C. The Contractor shall implement an identification system that ensures that all workers and visitors to the project can be immediately identified as authorized to be on the project. The Contractor shall be responsible for administering that system. The Contactor must notify the Awarding Authority immediately of any breach of this security system.

END OF SECTION

CONTRACTOR INFORMATION
(To be submitted as part of the Non-Price Submission)

If a Corporation:

Incorporated in what State: _____

President's Name: _____

Treasurer's Name: _____

Secretary's Name: _____

If a foreign corporation, are you registered to do business in Massachusetts?
Yes _____ No _____
(If "yes", to be considered for selection for this work, it is required under Massachusetts General Law to obtain from the Secretary of State, Foreign Corporations Section, a certificate stating that the corporation is registered to do business in Massachusetts, and to furnish such certificate with the Non-Price Submission.)

If a Partnership, name all partners:

Name: _____ Residence: _____

Name: _____ Residence: _____

Name: _____ Residence: _____

If an Individual:

Name: _____ Residence: _____

If an individual doing business under a firm name:

Name of Firm: _____

Business Address: _____

Name of Individual: _____

END OF SECTION

CERTIFICATION

LABOR HARMONY AND OSHA TRAINING REQUIREMENTS

The undersigned certifies under penalties of perjury that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed at the work

and

that all employees to be employed at the worksite and in the work will have completed an OSHA-approved construction safety and health course lasting at least ten (10) hours.

Signature_____ Date_____

_____ _____

Print Name & Title Company Name

CERTIFICATE OF VOTE

At a duly authorized meeting the Board of Directors of the _____ held on _____ it was

VOTED, THAT

_____ _____
(Name) (Officer)

of _____ be and hereby is authorized to execute contracts and bonds in the name and on behalf of said _____, and affix its corporate seal hereto; and such execution of any contract or obligation in the name of _____ on its behalf by such officer under seal of _____, shall be valid and binding upon _____.

I hereby certify that I am the clerk of the above named _____ and that _____ is the duly elected officer as above of said _____, and that the above vote has not been amended or rescinded and remains in full force and effect as the date of this contract.

_____ _____
(Date) (Clerk)

CERTIFICATIONS

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean natural person, business, partnership, corporation, committee, union, club or other organization, entity, or group of individuals.

Signature_____ Date_____

_____ _____

Print Name & Title Company Name

CERTIFICATE OF TAX COMPLIANCE

Pursuant to Chapter 62C of the Massachusetts General Laws, Section 49A (b), I

_____, authorized signatory for _____

Name of individual *Name of contractor*

do hereby certify under the pains and penalties of perjury that said contractor has complied with all laws of the Commonwealth of Massachusetts, and the Town of North Andover, relating to taxes, permit or other fees, reporting of employees and contractors, and withholding and remitting child support.

_____ _____

Signature Date

MINIMUM WAGE RATES

1.01 GENERAL REQUIREMENTS

A. The listing of CLASSIFICATIONS AND MINIMUM WAGE RATES as determined by The Commonwealth of Massachusetts Department of Labor and Workforce Development under the provisions of MGL c.149, ss.26 to 27H inclusive and as amended, are attached herewith and are hereby made a part of the Contract Documents.

B. The Contractor and all Subcontractors shall comply with the requirements of MGL c149, §§ 26 to 27H, inclusive and as amended.

C. It is the obligation of the Contractor to assure that the Contractor and all of its subcontractors comply with the requirements of the Massachusetts Prevailing Wage Law, MGL c149 §§26 to 27H, inclusive and as amended. The Contractor shall be responsible for all loss, cost and damage suffered or incurred by the Owner as a result of any stop work order or other enforcement action taken by the Attorney General under the authority of MGL c149 §27, and shall release, indemnify, hold harmless and defend the Owner, the Owner's Project Manager, the Architect, their officers, employees and consultants, from and against all claims, actions, suits, fines, or administrative proceedings arising out of or related to the violation by the Contractor or any subcontractor of the said Prevailing Wage Law (or, in the case of the Contractor's defense obligation, the claimed violation thereof).

D. The Contractor and all its subcontractors shall pay laborers to be employed on the project of wages in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The Contractor shall indemnify the awarding authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work, arising out of or as a result if (1) the failure of the said bid to be based upon the payment of the said applicable prevailing wage rates or (2) the failure of the bidder, if selected as the contractor, to pay laborers employed on the project the said applicable prevailing wage rates.

In accordance with the requirements of MGL c.149, s.27B, the Contractor shall submit, and shall require all of its subcontractors to keep a record of hours and wages paid to laborers employed on the project to submit, to the Awarding Authority on a weekly basis, copies of such records. All such weekly submissions shall be accompanied by the following certification:

The undersigned contractor hereby certifies, under the pains and penalties of perjury, the foregoing payroll records are true and accurate records of the wages paid to laborers employed on the project for the period stated and said wages are in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned contractor agrees to indemnify the awarding authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work, arising out of or

as a result of (1) the contractor's failure to pay laborers employed on the project the said applicable prevailing wages rates or (2) the failure of the foregoing payroll records to accurately state the said applicable prevailing wage rates; or the failure of the foregoing payroll records to accurately represent the wages actually paid to laborers employed on the project.

Date: _____ Contractor: _____

Name: _____

Title: _____

Prevailing Wage Rates

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

Awarding Authority: North Andover School Department

Contract Number: S123917 **City/Town:** NORTH ANDOVER

Description of Work: Early Childhood Center Modular Addition - Modular Classroom & Pre-Engineered Building Addition

Job Location: 566 Main Street

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2016	$32.15	$10.91	$10.89	$0.00	$53.95
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2016	$32.22	$10.91	$10.89	$0.00	$54.02
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2016	$32.34	$10.91	$10.89	$0.00	$54.14
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2015	$88.29	$9.80	$19.23	$0.00	$117.32
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	06/01/2017	$33.15	$7.60	$13.50	$0.00	$54.25
	12/01/2017	$33.78	$7.60	$13.50	$0.00	$54.88
	06/01/2018	$34.62	$7.60	$13.50	$0.00	$55.72
	12/01/2018	$35.46	$7.60	$13.50	$0.00	$56.56
	06/01/2019	$36.33	$7.60	$13.50	$0.00	$57.43
	12/01/2019	$37.19	$7.60	$13.50	$0.00	$58.29
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	06/01/2017	$34.90	$11.50	$7.10	$0.00	$53.50
	12/01/2017	$35.90	$11.50	$7.10	$0.00	$54.50
	06/01/2018	$36.90	$11.50	$7.10	$0.00	$55.50
	12/01/2018	$37.90	$11.50	$7.10	$0.00	$56.50
	06/01/2019	$38.90	$11.50	$7.10	$0.00	$57.50
	12/01/2019	$39.90	$11.50	$7.10	$0.00	$58.50
	06/01/2020	$40.90	$11.50	$7.10	$0.00	$59.50
	12/01/2020	$41.90	$11.50	$7.10	$0.00	$60.50
ASPHALT RAKER *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$46.38	$10.00	$15.25	$0.00	$71.63
	12/01/2017	$47.38	$10.00	$15.25	$0.00	$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$46.38	$10.00	$15.25	$0.00	$71.63
	12/01/2017	$47.38	$10.00	$15.25	$0.00	$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	06/01/2017	$33.15	$7.60	$13.50	$0.00	$54.25
	12/01/2017	$33.78	$7.60	$13.50	$0.00	$54.88
	06/01/2018	$34.62	$7.60	$13.50	$0.00	$55.72
	12/01/2018	$35.46	$7.60	$13.50	$0.00	$56.56
	06/01/2019	$36.33	$7.60	$13.50	$0.00	$57.43
	12/01/2019	$37.19	$7.60	$13.50	$0.00	$58.29
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2017	$42.92	$6.97	$16.21	$0.00	$66.10

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$27.90	$6.97	$10.54	$0.00	$45.41
2	65	$27.90	$6.97	$10.54	$0.00	$45.41
3	70	$30.04	$6.97	$11.35	$0.00	$48.36
4	75	$32.19	$6.97	$12.16	$0.00	$51.32
5	80	$34.34	$6.97	$12.97	$0.00	$54.28
6	85	$36.48	$6.97	$13.78	$0.00	$57.23
7	90	$38.63	$6.97	$14.59	$0.00	$60.19
8	95	$40.77	$6.97	$15.40	$0.00	$63.14

Notes:

Apprentice to Journeyworker Ratio:1:5

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (LYNN)*	08/01/2017	$52.06	$10.75	$19.35	$0.00	$82.16
	02/01/2018	$52.74	$10.75	$19.35	$0.00	$82.84
	08/01/2018	$54.09	$10.75	$19.48	$0.00	$84.32
	02/01/2019	$54.73	$10.75	$19.48	$0.00	$84.96
	08/01/2019	$56.08	$10.75	$19.62	$0.00	$86.45
	02/01/2020	$56.72	$10.75	$19.62	$0.00	$87.09
	08/01/2020	$58.07	$10.75	$19.77	$0.00	$88.59
	02/01/2021	$58.71	$10.75	$19.77	$0.00	$89.23
	08/01/2021	$60.11	$10.75	$19.93	$0.00	$90.79
	02/01/2022	$60.70	$10.75	$19.93	$0.00	$91.38

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 Lynn*

Effective Date - 08/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$10.75	$19.35	$0.00	$56.13
2	60	$31.24	$10.75	$19.35	$0.00	$61.34
3	70	$36.44	$10.75	$19.35	$0.00	$66.54
4	80	$41.65	$10.75	$19.35	$0.00	$71.75
5	90	$46.85	$10.75	$19.35	$0.00	$76.95

Effective Date - 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.37	$10.75	$19.35	$0.00	$56.47
2	60	$31.64	$10.75	$19.35	$0.00	$61.74
3	70	$36.92	$10.75	$19.35	$0.00	$67.02
4	80	$42.19	$10.75	$19.35	$0.00	$72.29
5	90	$47.47	$10.75	$19.35	$0.00	$77.57

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2016	$37.45	$7.60	$14.35	$0.00	$59.40
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2016	$36.30	$7.60	$14.35	$0.00	$58.25
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2016	$36.30	$7.60	$14.35	$0.00	$58.25
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	09/01/2017	$39.28	$9.90	$17.50	$0.00	$66.68
	03/01/2018	$40.28	$9.90	$17.50	$0.00	$67.68
	09/01/2018	$41.32	$9.90	$17.50	$0.00	$68.72
	03/01/2019	$42.35	$9.90	$17.50	$0.00	$69.75

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.64	$9.90	$1.73	$0.00	$31.27
2	60	$23.57	$9.90	$1.73	$0.00	$35.20
3	70	$27.50	$9.90	$12.31	$0.00	$49.71
4	75	$29.46	$9.90	$12.31	$0.00	$51.67
5	80	$31.42	$9.90	$14.04	$0.00	$55.36
6	80	$31.42	$9.90	$14.04	$0.00	$55.36
7	90	$35.35	$9.90	$15.77	$0.00	$61.02
8	90	$35.35	$9.90	$15.77	$0.00	$61.02

Effective Date - 03/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.14	$9.90	$1.73	$0.00	$31.77
2	60	$24.17	$9.90	$1.73	$0.00	$35.80
3	70	$28.20	$9.90	$12.31	$0.00	$50.41
4	75	$30.21	$9.90	$12.31	$0.00	$52.42
5	80	$32.22	$9.90	$14.04	$0.00	$56.16
6	80	$32.22	$9.90	$14.04	$0.00	$56.16
7	90	$36.25	$9.90	$15.77	$0.00	$61.92
8	90	$36.25	$9.90	$15.77	$0.00	$61.92

Notes:

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (LYNN)*	07/01/2017	$47.40	$12.20	$19.41	$1.30	$80.31
	01/01/2018	$48.17	$12.20	$19.41	$1.30	$81.08
	07/01/2018	$49.56	$12.20	$19.41	$1.30	$82.47
	01/01/2019	$50.30	$12.20	$19.41	$1.30	$83.21
	07/01/2019	$51.69	$12.20	$19.41	$1.30	$84.60
	01/01/2020	$52.44	$12.20	$19.41	$1.30	$85.35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CEMENT MASONRY/PLASTERING - Eastern Mass (Lynn)*

Effective Date - 07/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.70	$12.20	$12.41	$0.00	$48.31
2	60	$28.44	$12.20	$14.41	$1.30	$56.35
3	65	$30.81	$12.20	$15.41	$1.30	$59.72
4	70	$33.18	$12.20	$16.41	$1.30	$63.09
5	75	$35.55	$12.20	$17.41	$1.30	$66.46
6	80	$37.92	$12.20	$18.41	$1.30	$69.83
7	90	$42.66	$12.20	$19.41	$1.30	$75.57

Effective Date - 01/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.09	$12.20	$12.41	$0.00	$48.70
2	60	$28.90	$12.20	$14.41	$1.30	$56.81
3	65	$31.31	$12.20	$15.41	$1.30	$60.22
4	70	$33.72	$12.20	$16.41	$1.30	$63.63
5	75	$36.13	$12.20	$17.41	$1.30	$67.04
6	80	$38.54	$12.20	$18.41	$1.30	$70.45
7	90	$43.35	$12.20	$19.41	$1.30	$76.26

Notes:
Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$47.38	$10.00	$15.25	$0.00	$72.63
	12/01/2017	$48.38	$10.00	$15.25	$0.00	$73.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$31.86	$10.00	$15.25	$0.00	$57.11
	12/01/2017	$32.55	$10.00	$15.25	$0.00	$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2017	$51.41	$7.85	$16.10	$0.00	$75.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.71	$7.85	$0.00	$0.00	$33.56
2	55	$28.28	$7.85	$3.66	$0.00	$39.79
3	60	$30.85	$7.85	$3.99	$0.00	$42.69
4	65	$33.42	$7.85	$4.32	$0.00	$45.59
5	70	$35.99	$7.85	$14.11	$0.00	$57.95
6	75	$38.56	$7.85	$14.44	$0.00	$60.85
7	80	$41.13	$7.85	$14.77	$0.00	$63.75
8	90	$46.27	$7.85	$15.44	$0.00	$69.56

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	06/01/2017	$37.00	$7.60	$14.65	$0.00	$59.25
	12/01/2017	$37.85	$7.60	$14.65	$0.00	$60.10
	06/01/2018	$38.80	$7.60	$14.65	$0.00	$61.05
	12/01/2018	$39.75	$7.60	$14.65	$0.00	$62.00
	06/01/2019	$40.75	$7.60	$14.65	$0.00	$63.00
	12/01/2019	$41.75	$7.60	$14.65	$0.00	$64.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	06/01/2017	$38.00	$7.60	$14.65	$0.00	$60.25
	12/01/2017	$38.85	$7.60	$14.65	$0.00	$61.10
	06/01/2018	$39.80	$7.60	$14.65	$0.00	$62.05
	12/01/2018	$40.75	$7.60	$14.65	$0.00	$63.00
	06/01/2019	$41.75	$7.60	$14.65	$0.00	$64.00
	12/01/2019	$42.75	$7.60	$14.65	$0.00	$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS *LABORERS - ZONE 2*	06/01/2017	$37.75	$7.60	$14.65	$0.00	$60.00
	12/01/2017	$38.60	$7.60	$14.65	$0.00	$60.85
	06/01/2018	$39.55	$7.60	$14.65	$0.00	$61.80
	12/01/2018	$40.50	$7.60	$14.65	$0.00	$62.75
	06/01/2019	$41.50	$7.60	$14.65	$0.00	$63.75
	12/01/2019	$42.50	$7.60	$14.65	$0.00	$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	06/01/2017	$38.00	$7.60	$14.65	$0.00	$60.25
	12/01/2017	$38.85	$7.60	$14.65	$0.00	$61.10
	06/01/2018	$39.80	$7.60	$14.65	$0.00	$62.05
	12/01/2018	$40.75	$7.60	$14.65	$0.00	$63.00
	06/01/2019	$41.75	$7.60	$14.65	$0.00	$64.00
	12/01/2019	$42.75	$7.60	$14.65	$0.00	$65.00
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	06/01/2017	$37.75	$7.60	$14.65	$0.00	$60.00
	12/01/2017	$38.60	$7.60	$14.65	$0.00	$60.85
	06/01/2018	$39.55	$7.60	$14.65	$0.00	$61.80
	12/01/2018	$40.50	$7.60	$14.65	$0.00	$62.75
	06/01/2019	$41.50	$7.60	$14.65	$0.00	$63.75
	12/01/2019	$42.50	$7.60	$14.65	$0.00	$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	06/01/2017	$37.00	$7.60	$14.65	$0.00	$59.25
	12/01/2017	$37.85	$7.60	$14.65	$0.00	$60.10
	06/01/2018	$38.80	$7.60	$14.65	$0.00	$61.05
	12/01/2018	$39.75	$7.60	$14.65	$0.00	$62.00
	06/01/2019	$40.75	$7.60	$14.65	$0.00	$63.00
	12/01/2019	$41.75	$7.60	$14.65	$0.00	$64.00
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2015	$58.86	$9.80	$19.23	$0.00	$87.89
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2015	$42.04	$9.80	$19.23	$0.00	$71.07
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2015	$63.06	$9.80	$19.23	$0.00	$92.09
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2015	$88.23	$9.80	$19.23	$0.00	$117.26
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *ELECTRICIANS LOCAL 103*	09/01/2017	$49.28	$13.00	$17.48	$0.00	$79.76
	03/01/2018	$50.15	$13.00	$17.85	$0.00	$81.00
	09/01/2018	$51.34	$13.00	$17.89	$0.00	$82.23
	03/01/2019	$52.53	$13.00	$17.93	$0.00	$83.46
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN *ELECTRICIANS LOCAL 103*	09/01/2017	$49.28	$13.00	$17.48	$0.00	$79.76
	03/01/2018	$50.15	$13.00	$17.85	$0.00	$81.00
	09/01/2018	$51.34	$13.00	$17.89	$0.00	$82.23
	03/01/2019	$52.53	$13.00	$17.93	$0.00	$83.46

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELECTRICIAN - Local 103*

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$19.71	$13.00	$0.59	$0.00	$33.30
2	40	$19.71	$13.00	$0.59	$0.00	$33.30
3	45	$22.18	$13.00	$13.39	$0.00	$48.57
4	45	$22.18	$13.00	$13.39	$0.00	$48.57
5	50	$24.64	$13.00	$13.76	$0.00	$51.40
6	55	$27.10	$13.00	$14.12	$0.00	$54.22
7	60	$29.57	$13.00	$14.50	$0.00	$57.07
8	65	$32.03	$13.00	$14.87	$0.00	$59.90
9	70	$34.50	$13.00	$15.25	$0.00	$62.75
10	75	$36.96	$13.00	$15.62	$0.00	$65.58

Effective Date - 03/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$20.06	$13.00	$0.60	$0.00	$33.66
2	40	$20.06	$13.00	$0.60	$0.00	$33.66
3	45	$22.57	$13.00	$13.61	$0.00	$49.18
4	45	$22.57	$13.00	$13.61	$0.00	$49.18
5	50	$25.08	$13.00	$13.99	$0.00	$52.07
6	55	$27.58	$13.00	$14.38	$0.00	$54.96
7	60	$30.09	$13.00	$14.76	$0.00	$57.85
8	65	$32.60	$13.00	$15.15	$0.00	$60.75
9	70	$35.11	$13.00	$15.53	$0.00	$63.64
10	75	$37.61	$13.00	$15.93	$0.00	$66.54

Notes: :
App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2017	$55.86	$15.28	$15.71	$0.00	$86.85

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.93	$15.28	$0.00	$0.00	$43.21
2	55	$30.72	$15.28	$15.71	$0.00	$61.71
3	65	$36.31	$15.28	$15.71	$0.00	$67.30
4	70	$39.10	$15.28	$15.71	$0.00	$70.09
5	80	$44.69	$15.28	$15.71	$0.00	$75.68

Notes:
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2017	$39.10	$15.28	$15.71	$0.00	$70.09
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2017	$42.15	$10.00	$15.25	$0.00	$67.40
	11/01/2017	$42.88	$10.00	$15.25	$0.00	$68.13
	05/01/2018	$43.59	$10.00	$15.25	$0.00	$68.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2017	$43.61	$10.00	$15.25	$0.00	$68.86
	11/01/2017	$44.34	$10.00	$15.25	$0.00	$69.59
	05/01/2018	$45.06	$10.00	$15.25	$0.00	$70.31
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2017	$22.41	$10.00	$15.25	$0.00	$47.66
	11/01/2017	$22.83	$10.00	$15.25	$0.00	$48.08
	05/01/2018	$23.26	$10.00	$15.25	$0.00	$48.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 103*	09/01/2017	$49.28	$13.00	$17.48	$0.00	$79.76
	03/01/2018	$50.15	$13.00	$17.85	$0.00	$81.00
	09/01/2018	$51.34	$13.00	$17.89	$0.00	$82.23
	03/01/2019	$52.53	$13.00	$17.93	$0.00	$83.46
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING*ELECTRICIANS LOCAL 103*	09/01/2017	$36.96	$13.00	$15.62	$0.00	$65.58
	03/01/2018	$37.61	$13.00	$15.93	$0.00	$66.54
	09/01/2018	$38.51	$13.00	$15.96	$0.00	$67.47
	03/01/2019	$39.40	$13.00	$15.98	$0.00	$68.38
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$38.49	$10.00	$15.25	$0.00	$63.74
	12/01/2017	$39.32	$10.00	$15.25	$0.00	$64.57
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER *LABORERS - ZONE 2*	06/01/2017	$20.50	$7.60	$13.50	$0.00	$41.60
	12/01/2017	$21.50	$7.60	$13.50	$0.00	$42.60
	06/01/2018	$21.50	$7.60	$13.50	$0.00	$42.60
	12/01/2018	$22.50	$7.60	$13.50	$0.00	$43.60
	06/01/2019	$22.50	$7.60	$13.50	$0.00	$43.60
	12/01/2019	$23.50	$7.60	$13.50	$0.00	$44.60
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	03/01/2016	$42.13	$9.80	$17.62	$0.00	$69.55

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.07	$9.80	$1.79	$0.00	$32.66
2	55	$23.17	$9.80	$1.79	$0.00	$34.76
3	60	$25.28	$9.80	$12.25	$0.00	$47.33
4	65	$27.38	$9.80	$12.25	$0.00	$49.43
5	70	$29.49	$9.80	$14.04	$0.00	$53.33
6	75	$31.60	$9.80	$14.04	$0.00	$55.44
7	80	$33.70	$9.80	$15.83	$0.00	$59.33
8	85	$35.81	$9.80	$15.83	$0.00	$61.44

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$46.38	$10.00	$15.25	$0.00	$71.63
	12/01/2017	$47.38	$10.00	$15.25	$0.00	$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$31.86	$10.00	$15.25	$0.00	$57.11
	12/01/2017	$32.55	$10.00	$15.25	$0.00	$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 35 (ZONE 2)*	01/01/2017	$40.91	$7.85	$16.10	$0.00	$64.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 35 Zone 2*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.46	$7.85	$0.00	$0.00	$28.31
2	55	$22.50	$7.85	$3.66	$0.00	$34.01
3	60	$24.55	$7.85	$3.99	$0.00	$36.39
4	65	$26.59	$7.85	$4.32	$0.00	$38.76
5	70	$28.64	$7.85	$14.11	$0.00	$50.60
6	75	$30.68	$7.85	$14.44	$0.00	$52.97
7	80	$32.73	$7.85	$14.77	$0.00	$55.35
8	90	$36.82	$7.85	$15.44	$0.00	$60.11

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$46.38	$10.00	$15.25	$0.00	$71.63
	12/01/2017	$47.38	$10.00	$15.25	$0.00	$72.63

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 06/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$25.51	$10.00	$0.00	$0.00	$35.51
2	60	$27.83	$10.00	$15.25	$0.00	$53.08
3	65	$30.15	$10.00	$15.25	$0.00	$55.40
4	70	$32.47	$10.00	$15.25	$0.00	$57.72
5	75	$34.79	$10.00	$15.25	$0.00	$60.04
6	80	$37.10	$10.00	$15.25	$0.00	$62.35
7	85	$39.42	$10.00	$15.25	$0.00	$64.67
8	90	$41.74	$10.00	$15.25	$0.00	$66.99

Effective Date - 12/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$26.06	$10.00	$0.00	$0.00	$36.06
2	60	$28.43	$10.00	$15.25	$0.00	$53.68
3	65	$30.80	$10.00	$15.25	$0.00	$56.05
4	70	$33.17	$10.00	$15.25	$0.00	$58.42
5	75	$35.54	$10.00	$15.25	$0.00	$60.79
6	80	$37.90	$10.00	$15.25	$0.00	$63.15
7	85	$40.27	$10.00	$15.25	$0.00	$65.52
8	90	$42.64	$10.00	$15.25	$0.00	$67.89

Notes:

Apprentice to Journeyworker Ratio:1:6

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - A*	08/01/2017	$43.83	$11.45	$24.03	$2.38	$81.69
	02/01/2018	$44.98	$11.45	$24.03	$2.38	$82.84
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 103*	09/01/2017	$49.28	$13.00	$17.48	$0.00	$79.76
	03/01/2018	$50.15	$13.00	$17.85	$0.00	$81.00
	09/01/2018	$51.34	$13.00	$17.89	$0.00	$82.23
	03/01/2019	$52.53	$13.00	$17.93	$0.00	$83.46
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - A*	08/01/2017	$43.83	$11.45	$24.03	$2.38	$81.69
	02/01/2018	$44.98	$11.45	$24.03	$2.38	$82.84
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PIPEFITTERS LOCAL 537 (Local 138)*	03/01/2017	$48.86	$9.70	$16.14	$0.00	$74.70
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PIPEFITTERS LOCAL 537 (Local 138)*	03/01/2017	$48.86	$9.70	$16.14	$0.00	$74.70
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS *LABORERS - ZONE 2*	06/01/2017	$33.15	$7.60	$13.50	$0.00	$54.25
	12/01/2017	$33.78	$7.60	$13.50	$0.00	$54.88
	06/01/2018	$34.62	$7.60	$13.50	$0.00	$55.72
	12/01/2018	$35.46	$7.60	$13.50	$0.00	$56.56
	06/01/2019	$36.33	$7.60	$13.50	$0.00	$57.43
	12/01/2019	$37.19	$7.60	$13.50	$0.00	$58.29
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	09/01/2017	$47.09	$11.75	$14.20	$0.00	$73.04
	09/01/2018	$49.34	$11.75	$14.20	$0.00	$75.29
	09/01/2019	$51.84	$11.75	$14.20	$0.00	$77.79

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston*

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.55	$11.75	$10.45	$0.00	$45.75
2	60	$28.25	$11.75	$11.20	$0.00	$51.20
3	70	$32.96	$11.75	$11.95	$0.00	$56.66
4	80	$37.67	$11.75	$12.70	$0.00	$62.12

Effective Date - 09/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.67	$11.75	$10.45	$0.00	$46.87
2	60	$29.60	$11.75	$11.20	$0.00	$52.55
3	70	$34.54	$11.75	$11.95	$0.00	$58.24
4	80	$39.47	$11.75	$12.70	$0.00	$63.92

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 7 (LAWRENCE AREA)*	03/16/2017	$40.24	$7.80	$20.85	$0.00	$68.89

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 7 Lawrence*

Effective Date - 03/16/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.14	$7.80	$20.85	$0.00	$52.79
2	70	$28.17	$7.80	$20.85	$0.00	$56.82
3	75	$30.18	$7.80	$20.85	$0.00	$58.83
4	80	$32.19	$7.80	$20.85	$0.00	$60.84
5	85	$34.20	$7.80	$20.85	$0.00	$62.85
6	90	$36.22	$7.80	$20.85	$0.00	$64.87

Notes:
Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	06/01/2017	$32.40	$7.60	$13.50	$0.00	$53.50
	12/01/2017	$33.03	$7.60	$13.50	$0.00	$54.13
	06/01/2018	$33.87	$7.60	$13.50	$0.00	$54.97
	12/01/2018	$34.71	$7.60	$13.50	$0.00	$55.81
	06/01/2019	$35.58	$7.60	$13.50	$0.00	$56.68
	12/01/2019	$36.44	$7.60	$13.50	$0.00	$57.54

Apprentice - *LABORER - Zone 2*

Effective Date - 06/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$19.44	$7.60	$13.50	$0.00	$40.54
2	70	$22.68	$7.60	$13.50	$0.00	$43.78
3	80	$25.92	$7.60	$13.50	$0.00	$47.02
4	90	$29.16	$7.60	$13.50	$0.00	$50.26

Effective Date - 12/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$19.82	$7.60	$13.50	$0.00	$40.92
2	70	$23.12	$7.60	$13.50	$0.00	$44.22
3	80	$26.42	$7.60	$13.50	$0.00	$47.52
4	90	$29.73	$7.60	$13.50	$0.00	$50.83

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	06/01/2017	$32.40	$7.60	$13.50	$0.00	$53.50
	12/01/2017	$33.03	$7.60	$13.50	$0.00	$54.13
	06/01/2018	$33.87	$7.60	$13.50	$0.00	$54.97
	12/01/2018	$34.71	$7.60	$13.50	$0.00	$55.81
	06/01/2019	$35.58	$7.60	$13.50	$0.00	$56.68
	12/01/2019	$36.44	$7.60	$13.50	$0.00	$57.54
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	06/01/2017	$32.40	$7.60	$13.50	$0.00	$53.50
	12/01/2017	$33.03	$7.60	$13.50	$0.00	$54.13
	06/01/2018	$33.87	$7.60	$13.50	$0.00	$54.97
	12/01/2018	$34.71	$7.60	$13.50	$0.00	$55.81
	06/01/2019	$35.58	$7.60	$13.50	$0.00	$56.68
	12/01/2019	$36.44	$7.60	$13.50	$0.00	$57.54
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	06/01/2017	$32.60	$7.60	$13.45	$0.00	$53.65
	12/01/2017	$33.23	$7.60	$13.45	$0.00	$54.28
	06/01/2018	$34.07	$7.60	$13.45	$0.00	$55.12
	12/01/2018	$34.91	$7.60	$13.45	$0.00	$55.96
	06/01/2019	$35.78	$7.60	$13.45	$0.00	$56.83
	12/01/2019	$36.64	$7.60	$13.45	$0.00	$57.69
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MASON TENDER *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	06/01/2017	$32.40	$7.60	$13.50	$0.00	$53.50
	12/01/2017	$33.03	$7.60	$13.50	$0.00	$54.13
	06/01/2018	$33.87	$7.60	$13.50	$0.00	$54.97
	12/01/2018	$34.71	$7.60	$13.50	$0.00	$55.81
	06/01/2019	$35.58	$7.60	$13.50	$0.00	$56.68
	12/01/2019	$36.44	$7.60	$13.50	$0.00	$57.54
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	06/01/2017	$32.40	$7.60	$13.50	$0.00	$53.50
	12/01/2017	$33.03	$7.60	$13.50	$0.00	$54.13
	06/01/2018	$33.87	$7.60	$13.50	$0.00	$54.97
	12/01/2018	$34.71	$7.60	$13.50	$0.00	$55.81
	06/01/2019	$35.58	$7.60	$13.50	$0.00	$56.68
	12/01/2019	$36.44	$7.60	$13.50	$0.00	$57.54
This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2017	$39.82	$10.75	$17.80	$0.00	$68.37
	02/01/2018	$40.36	$10.75	$17.80	$0.00	$68.91
	08/01/2018	$41.44	$10.75	$17.93	$0.00	$70.12
	02/01/2019	$41.95	$10.75	$17.93	$0.00	$70.63
	08/01/2019	$43.03	$10.75	$18.07	$0.00	$71.85
	02/01/2020	$43.54	$10.75	$18.07	$0.00	$72.36
	08/01/2020	$44.62	$10.75	$18.22	$0.00	$73.59
	02/01/2021	$45.13	$10.75	$18.22	$0.00	$74.10
	08/01/2021	$46.25	$10.75	$18.38	$0.00	$75.38
	02/01/2022	$46.72	$10.75	$18.38	$0.00	$75.85

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE & TILE FINISHER - Local 3 Marble & Tile*

Effective Date - 08/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.91	$10.75	$17.80	$0.00	$48.46
2	60	$23.89	$10.75	$17.80	$0.00	$52.44
3	70	$27.87	$10.75	$17.80	$0.00	$56.42
4	80	$31.86	$10.75	$17.80	$0.00	$60.41
5	90	$35.84	$10.75	$17.80	$0.00	$64.39

Effective Date - 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.18	$10.75	$17.80	$0.00	$48.73
2	60	$24.22	$10.75	$17.80	$0.00	$52.77
3	70	$28.25	$10.75	$17.80	$0.00	$56.80
4	80	$32.29	$10.75	$17.80	$0.00	$60.84
5	90	$36.32	$10.75	$17.80	$0.00	$64.87

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2017	$52.10	$10.75	$19.35	$0.00	$82.20
	02/01/2018	$52.78	$10.75	$19.35	$0.00	$82.88
	08/01/2018	$54.13	$10.75	$19.48	$0.00	$84.36
	02/01/2019	$54.75	$10.75	$19.48	$0.00	$84.98
	08/01/2019	$56.10	$10.75	$19.62	$0.00	$86.47
	02/01/2020	$56.73	$10.75	$19.62	$0.00	$87.10
	08/01/2020	$58.08	$10.75	$19.77	$0.00	$88.60
	02/01/2021	$58.72	$10.75	$19.77	$0.00	$89.24
	08/01/2021	$60.12	$10.75	$19.93	$0.00	$90.80
	02/01/2022	$60.69	$10.75	$19.93	$0.00	$91.37

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile*

Effective Date - 08/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.05	$10.75	$19.35	$0.00	$56.15
2	60	$31.26	$10.75	$19.35	$0.00	$61.36
3	70	$36.47	$10.75	$19.35	$0.00	$66.57
4	80	$41.68	$10.75	$19.35	$0.00	$71.78
5	90	$46.89	$10.75	$19.35	$0.00	$76.99

Effective Date - 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.39	$10.75	$19.35	$0.00	$56.49
2	60	$31.67	$10.75	$19.35	$0.00	$61.77
3	70	$36.95	$10.75	$19.35	$0.00	$67.05
4	80	$42.22	$10.75	$19.35	$0.00	$72.32
5	90	$47.50	$10.75	$19.35	$0.00	$77.60

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	10/01/2017	$36.32	$9.90	$18.50	$0.00	$64.72
	04/01/2018	$37.17	$9.90	$18.50	$0.00	$65.57
	10/01/2018	$38.02	$9.90	$18.50	$0.00	$66.42
	04/01/2019	$38.87	$9.90	$18.50	$0.00	$67.27

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 10/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$9.90	$5.31	$21.74	$36.95
2	0	$0.00	$9.90	$15.13	$25.69	$50.72
3	0	$0.00	$9.90	$16.10	$29.64	$55.64
4	0	$0.00	$9.90	$17.06	$33.59	$60.55

Effective Date - 04/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$9.90	$5.31	$22.23	$37.44
2	0	$0.00	$9.90	$15.13	$26.27	$51.30
3	0	$0.00	$9.90	$16.10	$30.32	$56.32
4	0	$0.00	$9.90	$17.06	$34.36	$61.32

Notes: Apprentice Wages same as set in Zone 1
Base Wage shown in "Supplemental Unemployment" column
Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$23.47	$10.00	$15.25	$0.00	$48.72
	12/01/2017	$23.99	$10.00	$15.25	$0.00	$49.24
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$27.54	$10.00	$15.25	$0.00	$52.79
	12/01/2017	$28.15	$10.00	$15.25	$0.00	$53.40
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2017	$51.41	$7.85	$16.10	$0.00	$75.36

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.71	$7.85	$0.00	$0.00	$33.56
2	55	$28.28	$7.85	$3.66	$0.00	$39.79
3	60	$30.85	$7.85	$3.99	$0.00	$42.69
4	65	$33.42	$7.85	$4.32	$0.00	$45.59
5	70	$35.99	$7.85	$14.11	$0.00	$57.95
6	75	$38.56	$7.85	$14.44	$0.00	$60.85
7	80	$41.13	$7.85	$14.77	$0.00	$63.75
8	90	$46.27	$7.85	$15.44	$0.00	$69.56

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2017	$42.31	$7.85	$16.10	$0.00	$66.26

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - New*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.16	$7.85	$0.00	$0.00	$29.01
2	55	$23.27	$7.85	$3.66	$0.00	$34.78
3	60	$25.39	$7.85	$3.99	$0.00	$37.23
4	65	$27.50	$7.85	$4.32	$0.00	$39.67
5	70	$29.62	$7.85	$14.11	$0.00	$51.58
6	75	$31.73	$7.85	$14.44	$0.00	$54.02
7	80	$33.85	$7.85	$14.77	$0.00	$56.47
8	90	$38.08	$7.85	$15.44	$0.00	$61.37

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2017	$40.37	$7.85	$16.10	$0.00	$64.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.19	$7.85	$0.00	$0.00	$28.04
2	55	$22.20	$7.85	$3.66	$0.00	$33.71
3	60	$24.22	$7.85	$3.99	$0.00	$36.06
4	65	$26.24	$7.85	$4.32	$0.00	$38.41
5	70	$28.26	$7.85	$14.11	$0.00	$50.22
6	75	$30.28	$7.85	$14.44	$0.00	$52.57
7	80	$32.30	$7.85	$14.77	$0.00	$54.92
8	90	$36.33	$7.85	$15.44	$0.00	$59.62

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS) *LABORERS - ZONE 2*	06/01/2017	$32.40	$7.60	$13.50	$0.00	$53.50
	12/01/2017	$33.03	$7.60	$13.50	$0.00	$54.13
	06/01/2018	$33.87	$7.60	$13.50	$0.00	$54.97
	12/01/2018	$34.71	$7.60	$13.50	$0.00	$55.81
	06/01/2019	$35.58	$7.60	$13.50	$0.00	$56.68
	12/01/2019	$36.44	$7.60	$13.50	$0.00	$57.54
For Apprentice rates see "Apprentice- LABORER"						
PAINTER / TAPER (BRUSH, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2017	$40.91	$7.85	$16.10	$0.00	$64.86

Apprentice - *PAINTER - Local 35 Zone 2 - BRUSH NEW*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.46	$7.85	$0.00	$0.00	$28.31
2	55	$22.50	$7.85	$3.66	$0.00	$34.01
3	60	$24.55	$7.85	$3.99	$0.00	$36.39
4	65	$26.59	$7.85	$4.32	$0.00	$38.76
5	70	$28.64	$7.85	$14.11	$0.00	$50.60
6	75	$30.68	$7.85	$14.44	$0.00	$52.97
7	80	$32.73	$7.85	$14.77	$0.00	$55.35
8	90	$36.82	$7.85	$15.44	$0.00	$60.11

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2017	$38.97	$7.85	$16.10	$0.00	$62.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - BRUSH REPAINT*

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.49	$7.85	$0.00	$0.00	$27.34
2	55	$21.43	$7.85	$3.66	$0.00	$32.94
3	60	$23.38	$7.85	$3.99	$0.00	$35.22
4	65	$25.33	$7.85	$4.32	$0.00	$37.50
5	70	$27.28	$7.85	$14.11	$0.00	$49.24
6	75	$29.23	$7.85	$14.44	$0.00	$51.52
7	80	$31.18	$7.85	$14.77	$0.00	$53.80
8	90	$35.07	$7.85	$15.44	$0.00	$58.36

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2012	$30.28	$9.07	$8.00	$0.00	$47.35
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2015	$42.04	$9.80	$19.23	$0.00	$71.07
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2015	$42.04	$9.80	$19.23	$0.00	$71.07

Apprentice - *PILE DRIVER - Local 56 Zone 1*

Effective Date - 08/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.02	$9.80	$19.23	$0.00	$50.05
2	60	$25.22	$9.80	$19.23	$0.00	$54.25
3	70	$29.43	$9.80	$19.23	$0.00	$58.46
4	75	$31.53	$9.80	$19.23	$0.00	$60.56
5	80	$33.63	$9.80	$19.23	$0.00	$62.66
6	80	$33.63	$9.80	$19.23	$0.00	$62.66
7	90	$37.84	$9.80	$19.23	$0.00	$66.87
8	90	$37.84	$9.80	$19.23	$0.00	$66.87

Notes:

Apprentice to Journeyworker Ratio:1:3

PIPEFITTER & STEAMFITTER *PIPEFITTERS LOCAL 537 (Local 138)*	03/01/2017	$48.86	$9.70	$16.14	$0.00	$74.70

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PIPEFITTER Local 537 (Local 138)*

Effective Date - 03/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$19.54	$9.70	$5.50	$0.00	$34.74
2	45	$21.99	$9.70	$16.14	$0.00	$47.83
3	60	$29.32	$9.70	$16.14	$0.00	$55.16
4	70	$34.20	$9.70	$16.14	$0.00	$60.04
5	80	$39.09	$9.70	$16.14	$0.00	$64.93

Notes:

** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.

Refrig/AC Mechanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

Apprentice to Journeyworker Ratio:**

PIPELAYER *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79

For apprentice rates see "Apprentice- LABORER"

PLUMBER *PLUMBERS & GASFITTERS LOCAL 12 (Local 138)*	03/01/2017	$48.61	$11.32	$15.46	$0.00	$75.39

Apprentice - *PLUMBER/GASFITTER - Local 12 (Local 138)*

Effective Date - 03/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$17.01	$11.32	$5.74	$0.00	$34.07
2	40	$19.44	$11.32	$6.49	$0.00	$37.25
3	55	$26.74	$11.32	$8.73	$0.00	$46.79
4	65	$31.60	$11.32	$10.23	$0.00	$53.15
5	75	$36.46	$11.32	$11.72	$0.00	$59.50

Notes:

Steps are 1 yr

Step 4 with lic$55.65 Step5 with lic$61.89

Apprentice to Journeyworker Ratio:1:5

PNEUMATIC CONTROLS (TEMP.) *PIPEFITTERS LOCAL 537 (Local 138)*	03/01/2017	$48.86	$9.70	$16.14	$0.00	$74.70

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER *LABORERS - ZONE 2*	06/01/2017	$33.40	$7.60	$13.50	$0.00	$54.50
	12/01/2017	$34.03	$7.60	$13.50	$0.00	$55.13
	06/01/2018	$34.87	$7.60	$13.50	$0.00	$55.97
	12/01/2018	$35.71	$7.60	$13.50	$0.00	$56.81
	06/01/2019	$36.58	$7.60	$13.50	$0.00	$57.68
	12/01/2019	$37.44	$7.60	$13.50	$0.00	$58.54
For apprentice rates see "Apprentice- LABORER"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$46.38	$10.00	$15.25	$0.00	$71.63
	12/01/2017	$47.38	$10.00	$15.25	$0.00	$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$46.38	$10.00	$15.25	$0.00	$71.63
	12/01/2017	$47.38	$10.00	$15.25	$0.00	$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$31.86	$10.00	$15.25	$0.00	$57.11
	12/01/2017	$32.55	$10.00	$15.25	$0.00	$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS LOCAL 42*	05/01/2017	$24.21	$8.49	$11.54	$0.00	$44.24
	04/30/2018	$24.21	$8.49	$11.96	$0.00	$44.66
	05/01/2018	$24.24	$8.49	$12.46	$0.00	$45.19
	04/30/2019	$24.24	$8.49	$12.92	$0.00	$45.65
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RESIDENTIAL WOOD FRAME (All Other Work) *CARPENTERS -ZONE 2 (Residential Wood)*	06/01/2016	$25.32	$9.80	$16.82	$0.00	$51.94
RESIDENTIAL WOOD FRAME CARPENTER ** ** The Residential Wood Frame Carpenter classification applies only to the construction of new, wood frame residences that do not exceed four stories including the basement.*CARPENTERS -ZONE 2 (Residential Wood)*	10/01/2017	$26.93	$7.07	$7.18	$0.00	$41.18
	04/01/2018	$27.35	$7.07	$7.18	$0.00	$41.60
	10/01/2018	$27.77	$7.07	$7.18	$0.00	$42.02
	04/01/2019	$28.20	$7.07	$7.18	$0.00	$42.45
	10/01/2019	$28.63	$7.07	$7.18	$0.00	$42.88

As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER (Residential Wood Frame) - Zone 2*

Effective Date - 10/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$16.16	$7.07	$0.00	$0.00	$23.23
2	60	$16.16	$7.07	$0.00	$0.00	$23.23
3	65	$17.50	$7.07	$7.18	$0.00	$31.75
4	70	$18.85	$7.07	$7.18	$0.00	$33.10
5	75	$20.20	$7.07	$7.18	$0.00	$34.45
6	80	$21.54	$7.07	$7.18	$0.00	$35.79
7	85	$22.89	$7.07	$7.18	$0.00	$37.14
8	90	$24.24	$7.07	$7.18	$0.00	$38.49

Effective Date - 04/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$16.41	$7.07	$0.00	$0.00	$23.48
2	60	$16.41	$7.07	$0.00	$0.00	$23.48
3	65	$17.78	$7.07	$7.18	$0.00	$32.03
4	70	$19.15	$7.07	$7.18	$0.00	$33.40
5	75	$20.51	$7.07	$7.18	$0.00	$34.76
6	80	$21.88	$7.07	$7.18	$0.00	$36.13
7	85	$23.25	$7.07	$7.18	$0.00	$37.50
8	90	$24.62	$7.07	$7.18	$0.00	$38.87

Notes:

Apprentice to Journeyworker Ratio:1:5

RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	08/01/2017	$41.36	$11.20	$14.80	$0.00	$67.36
	02/01/2018	$42.51	$11.20	$14.80	$0.00	$68.51
	08/01/2018	$43.61	$11.20	$14.80	$0.00	$69.61
	02/01/2019	$44.76	$11.20	$14.80	$0.00	$70.76

Apprentice - *ROOFER - Local 33*

Effective Date - 08/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.68	$11.20	$3.44	$0.00	$35.32
2	60	$24.82	$11.20	$14.80	$0.00	$50.82
3	65	$26.88	$11.20	$14.80	$0.00	$52.88
4	75	$31.02	$11.20	$14.80	$0.00	$57.02
5	85	$35.16	$11.20	$14.80	$0.00	$61.16

Effective Date - 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.26	$11.20	$3.44	$0.00	$35.90
2	60	$25.51	$11.20	$14.80	$0.00	$51.51
3	65	$27.63	$11.20	$14.80	$0.00	$53.63
4	75	$31.88	$11.20	$14.80	$0.00	$57.88
5	85	$36.13	$11.20	$14.80	$0.00	$62.13

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
(Hot Pitch Mechanics' receive $1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	08/01/2017	$41.61	$11.20	$14.80	$0.00	$67.61
	02/01/2018	$42.76	$11.20	$14.80	$0.00	$68.76
	08/01/2018	$43.86	$11.20	$14.80	$0.00	$69.86
	02/01/2019	$45.01	$11.20	$14.80	$0.00	$71.01
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - A*	08/01/2017	$43.83	$11.45	$24.03	$2.38	$81.69
	02/01/2018	$44.98	$11.45	$24.03	$2.38	$82.84

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SHEET METAL WORKER - Local 17-A*

Effective Date - 08/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.53	$11.45	$5.61	$0.00	$34.59
2	40	$17.53	$11.45	$5.61	$0.00	$34.59
3	45	$19.72	$11.45	$10.76	$1.26	$43.19
4	45	$19.72	$11.45	$10.76	$1.26	$43.19
5	50	$21.92	$11.45	$11.71	$1.35	$46.43
6	50	$21.92	$11.45	$11.96	$1.36	$46.69
7	60	$26.30	$11.45	$13.61	$1.54	$52.90
8	65	$28.49	$11.45	$14.56	$1.64	$56.14
9	75	$32.87	$11.45	$16.47	$1.82	$62.61
10	85	$37.26	$11.45	$17.87	$2.00	$68.58

Effective Date - 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.99	$11.45	$5.24	$0.00	$34.68
2	40	$17.99	$11.45	$5.24	$0.00	$34.68
3	45	$20.24	$11.45	$10.31	$1.27	$43.27
4	45	$20.24	$11.45	$10.31	$1.27	$43.27
5	50	$22.49	$11.45	$11.21	$1.37	$46.52
6	50	$22.49	$11.45	$11.46	$1.38	$46.78
7	60	$26.99	$11.45	$13.02	$1.56	$53.02
8	65	$29.24	$11.45	$13.93	$1.67	$56.29
9	75	$33.74	$11.45	$15.74	$1.85	$62.78
10	85	$38.23	$11.45	$17.05	$2.03	$68.76

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SIGN ERECTOR *PAINTERS LOCAL 35 - ZONE 2*	06/01/2013	$25.81	$7.07	$7.05	$0.00	$39.93

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SIGN ERECTOR - Local 35 Zone 2*

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$12.91	$7.07	$0.00	$0.00	$19.98
2	55	$14.20	$7.07	$2.45	$0.00	$23.72
3	60	$15.49	$7.07	$2.45	$0.00	$25.01
4	65	$16.78	$7.07	$2.45	$0.00	$26.30
5	70	$18.07	$7.07	$7.05	$0.00	$32.19
6	75	$19.36	$7.07	$7.05	$0.00	$33.48
7	80	$20.65	$7.07	$7.05	$0.00	$34.77
8	85	$21.94	$7.07	$7.05	$0.00	$36.06
9	90	$23.23	$7.07	$7.05	$0.00	$37.35

Notes:
Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2016	$32.44	$10.91	$10.89	$0.00	$54.24
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2016	$32.73	$10.91	$10.89	$0.00	$54.53
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2*	03/01/2017	$50.47	$8.77	$17.20	$0.00	$76.44

Apprentice - *SPRINKLER FITTER - Local 550 (Section B) Zone 2*

Effective Date - 03/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$17.66	$8.77	$8.70	$0.00	$35.13
2	40	$20.19	$8.77	$8.70	$0.00	$37.66
3	45	$22.71	$8.77	$8.70	$0.00	$40.18
4	50	$25.24	$8.77	$8.70	$0.00	$42.71
5	55	$27.76	$8.77	$8.70	$0.00	$45.23
6	60	$30.28	$8.77	$10.20	$0.00	$49.25
7	65	$32.81	$8.77	$10.20	$0.00	$51.78
8	70	$35.33	$8.77	$10.20	$0.00	$54.30
9	75	$37.85	$8.77	$10.20	$0.00	$56.82
10	80	$40.38	$8.77	$10.20	$0.00	$59.35

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 103*	09/01/2017	$36.96	$13.00	$15.62	$0.00	$65.58
	03/01/2018	$37.61	$13.00	$15.93	$0.00	$66.54
	09/01/2018	$38.51	$13.00	$15.96	$0.00	$67.47
	03/01/2019	$39.40	$13.00	$15.98	$0.00	$68.38

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 103*

Effective Date - 09/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$14.78	$13.00	$0.44	$0.00	$28.22
2	40	$14.78	$13.00	$0.44	$0.00	$28.22
3	45	$16.63	$13.00	$12.55	$0.00	$42.18
4	45	$16.63	$13.00	$12.55	$0.00	$42.18
5	50	$18.48	$13.00	$12.82	$0.00	$44.30
6	55	$20.33	$13.00	$13.10	$0.00	$46.43
7	60	$22.18	$13.00	$13.39	$0.00	$48.57
8	65	$24.02	$13.00	$13.66	$0.00	$50.68
9	70	$25.87	$13.00	$13.95	$0.00	$52.82
10	75	$27.72	$13.00	$14.22	$0.00	$54.94

Effective Date - 03/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$15.04	$13.00	$0.45	$0.00	$28.49
2	40	$15.04	$13.00	$0.45	$0.00	$28.49
3	45	$16.92	$13.00	$12.74	$0.00	$42.66
4	45	$16.92	$13.00	$12.74	$0.00	$42.66
5	50	$18.81	$13.00	$13.03	$0.00	$44.84
6	55	$20.69	$13.00	$13.32	$0.00	$47.01
7	60	$22.57	$13.00	$13.61	$0.00	$49.18
8	65	$24.45	$13.00	$13.90	$0.00	$51.35
9	70	$26.33	$13.00	$14.19	$0.00	$53.52
10	75	$28.21	$13.00	$14.48	$0.00	$55.69

Notes:

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2017	$51.00	$10.75	$19.35	$0.00	$81.10
	02/01/2018	$51.68	$10.75	$19.35	$0.00	$81.78
	08/01/2018	$53.03	$10.75	$19.48	$0.00	$83.26
	02/01/2019	$53.67	$10.75	$19.48	$0.00	$83.90
	08/01/2019	$55.02	$10.75	$19.62	$0.00	$85.39
	02/01/2020	$55.66	$10.75	$19.62	$0.00	$86.03
	08/01/2020	$57.01	$10.75	$19.77	$0.00	$87.53
	02/01/2021	$57.65	$10.75	$19.77	$0.00	$88.17
	08/01/2021	$59.05	$10.75	$19.93	$0.00	$89.73
	02/01/2022	$59.64	$10.75	$19.93	$0.00	$90.32

Apprentice - *TERRAZZO FINISHER - Local 3 Marble & Tile*

Effective Date - 08/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.50	$10.75	$19.35	$0.00	$55.60
2	60	$30.60	$10.75	$19.35	$0.00	$60.70
3	70	$35.70	$10.75	$19.35	$0.00	$65.80
4	80	$40.80	$10.75	$19.35	$0.00	$70.90
5	90	$45.90	$10.75	$19.35	$0.00	$76.00

Effective Date - 02/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.84	$10.75	$19.35	$0.00	$55.94
2	60	$31.01	$10.75	$19.35	$0.00	$61.11
3	70	$36.18	$10.75	$19.35	$0.00	$66.28
4	80	$41.34	$10.75	$19.35	$0.00	$71.44
5	90	$46.51	$10.75	$19.35	$0.00	$76.61

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE* For apprentice rates see "Apprentice- LABORER"	12/01/2016	$37.70	$7.60	$14.35	$0.00	$59.65
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE* For apprentice rates see "Apprentice- LABORER"	12/01/2016	$36.42	$7.60	$14.35	$0.00	$58.37
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE* For apprentice rates see "Apprentice- LABORER"	12/01/2016	$36.30	$7.60	$14.35	$0.00	$58.25
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	06/01/2017	$45.93	$10.00	$15.25	$0.00	$71.18
	12/01/2017	$46.92	$10.00	$15.25	$0.00	$72.17
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2016	$33.02	$10.91	$10.89	$0.00	$54.82

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)* For apprentice rates see "Apprentice- LABORER"	12/01/2016	$48.58	$7.60	$14.75	$0.00	$70.93
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)* For apprentice rates see "Apprentice- LABORER"	12/01/2016	$50.58	$7.60	$14.75	$0.00	$72.93
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)* For apprentice rates see "Apprentice- LABORER"	12/01/2016	$40.65	$7.60	$14.75	$0.00	$63.00
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)* For apprentice rates see "Apprentice- LABORER"	12/01/2016	$42.65	$7.60	$14.75	$0.00	$65.00
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2016	$32.44	$10.91	$10.89	$0.00	$54.24
WAGON DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2017	$32.65	$7.60	$13.50	$0.00	$53.75
	12/01/2017	$33.28	$7.60	$13.50	$0.00	$54.38
	06/01/2018	$34.12	$7.60	$13.50	$0.00	$55.22
	12/01/2018	$34.96	$7.60	$13.50	$0.00	$56.06
	06/01/2019	$35.83	$7.60	$13.50	$0.00	$56.93
	12/01/2019	$36.69	$7.60	$13.50	$0.00	$57.79
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2017	$46.38	$10.00	$15.25	$0.00	$71.63
	12/01/2017	$47.38	$10.00	$15.25	$0.00	$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & GASFITTERS LOCAL 12 (Local 138)*	03/01/2017	$48.61	$11.32	$15.46	$0.00	$75.39
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/03/2017	$27.14	$7.75	$1.81	$0.00	$36.70
CABLEMAN (Underground Ducts & Cables) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/03/2017	$38.45	$7.75	$9.53	$0.00	$55.73
DRIVER / GROUNDMAN CDL *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/03/2017	$31.66	$7.75	$9.44	$0.00	$48.85
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/03/2017	$24.88	$7.75	$1.75	$0.00	$34.38
EQUIPMENT OPERATOR (Class A CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/03/2017	$38.45	$7.75	$13.61	$0.00	$59.81
EQUIPMENT OPERATOR (Class B CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/03/2017	$33.92	$7.75	$10.21	$0.00	$51.88
GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/03/2017	$24.88	$7.75	$1.75	$0.00	$34.38
GROUNDMAN -Inexperienced (<2000 Hrs.) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/03/2017	$20.35	$7.75	$1.61	$0.00	$29.71

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
JOURNEYMAN LINEMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	09/03/2017	$45.23	$7.75	$16.61	$0.00	$69.59

Apprentice - *LINEMAN (Outside Electrical) - East Local 104*

Effective Date - 09/03/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$27.14	$7.75	$3.31	$0.00	$38.20
2	65	$29.40	$7.75	$3.38	$0.00	$40.53
3	70	$31.66	$7.75	$3.45	$0.00	$42.86
4	75	$33.92	$7.75	$5.02	$0.00	$46.69
5	80	$36.18	$7.75	$5.09	$0.00	$49.02
6	85	$38.45	$7.75	$5.15	$0.00	$51.35
7	90	$40.71	$7.75	$7.22	$0.00	$55.68

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	01/01/2016	$28.98	$4.25	$3.12	$0.00	$36.35
TELEDATA LINEMAN/EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	01/01/2016	$27.31	$4.25	$3.07	$0.00	$34.63
TELEDATA WIREMAN/INSTALLER/TECHNICIAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	01/01/2016	$27.31	$4.25	$3.07	$0.00	$34.63
TREE TRIMMER *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	01/31/2016	$18.51	$3.55	$0.00	$0.00	$22.06

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.

TREE TRIMMER GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	01/31/2016	$16.32	$3.55	$0.00	$0.00	$19.87

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)
Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.
*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form is available from the Department of Labor Standards (DLS) at www.mass.gov/dols/pw and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

On a weekly basis, every contractor and subcontractor is required to submit a certified copy of their weekly payroll records to the awarding authority; this includes the payroll forms and the Statement of Compliance form. The certified payroll records must be submitted either by regular mail or by e-mail to the awarding authority. Once collected, the awarding authority is required to preserve those records for three years from the date of completion of the project.

Each such contractor and subcontractor shall furnish weekly **and** within 15 days after completion of its portion of the work, to the awarding authority directly by first-class mail or e-mail, a statement, executed by the contractor, subcontractor or by any authorized officer thereof who supervised the payment of wages, this form, accompanied by their payroll:

STATEMENT OF COMPLIANCE

_____, 20_____

I,_____,_____
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by _____ on the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____

Title _____

05/14

MASSACHUSETTS WEEKLY CERTIFIED PAYROLL REPORT FORM

Company's Name:	Address:	Phone No.:	Payroll No.:

Employer's Signature:	Title:	Contract No:	Tax Payer ID Number	Work Week Ending:

Awarding Authority's Name:	Public Works Project Name:	Public Works Project Location:	Min. Wage Rate Sheet Number

General / Prime Contractor's Name:	Subcontractor's Name:		"Employer" Hourly Fringe Benefit Contributions

Employee Name & Complete Address	Work Classification:	Employee is OSHA 10 certified (?)	Appr. Rate (%)	Hours Worked Su.	Mo.	Tu.	We.	Th.	Fr.	Sa.	Project Hours (A) All Other Hours	Hourly Base Wage (B)	Health & Welfare Insurance (C)	ERISA Pension Plan (D)	Supp. Unemp. (E)	Total Hourly Prev. Wage (B+C+D+E) (F)	Project Gross Wages (A x F) Total Gross Wages	Check No. (H)

Are all apprentice employees identified above currently registered with the MA DLS's Division of Apprentice Standards? YES ☐ NO ☐

For all apprentices performing work during the reporting period, attach a copy of the apprentice identification card issued by the Massachusetts Department of Labor Standards / Division of Apprentice Standards. No apprentices are identified above ☐

NOTE: Pursuant to MGL c. 149, s. 27B, every contractor and subcontractor is required to submit a **true and accurate** copy of their certified weekly payroll records to the awarding authority by first-class mail or e-mail. In addition, each weekly payroll must be accompanied by a statement of compliance signed by the employer. Failure to comply may result in the commencement of a criminal action or the issuance of a civil citation.

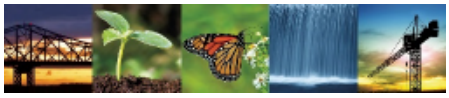
Page _____ of _____

Date Received by Awarding Authority
/ /

LIST OF DRAWINGS

GENERAL	
T1.00	TITLE SHEET
CIVIL	
EX-01	EXISTING CONDITIONS SURVEY PART 1
EX-02	EXISTING CONDITIONS SURVEY PART 2
C1	BUILDING PAD PREP & SITE WORK PLAN
C2	PROPOSED GRADING PLAN
DEMOLITION	
D1.01	FIRST FLOOR DEMOLITION PLAN
ARCHITECTURAL	
A0.01	LEGEND, NOTES & ABBREVIATIONS
A1.01	FIRST FLOOR KEY PLAN
A1.11	FIRST FLOOR PLAN PART-A
A1.12A	FIRST FLOOR PLAN PART-B
A1.12B	FIRST FLOOR PLAN PART-B ALTERNATES
A1.20	ROOF PLAN
A1.31	ENLARGED PLANS AND DETAILS
A2.10	EXTERIOR ELEVATIONS
A4.10	BUILDING SECTIONS
A4.11	WALL SECTIONS
A4.12	WALL SECTIONS
A5.10	INTERIOR ELEVATIONS AND CASEWORK DETAILS
A6.01	FIRST FLOOR RCP KEY PLAN
A6.11	FIRST FLOOR RCP PART-A
A6.12	FIRST FLOOR RCP PART-B
A7.01	ROOM FINISH & DOOR SCHEDULE
STRUCTURAL	
S-0	GENERAL NOTES, TYPICAL DETAILS & SCHEDULES
S-1	FOUNDATION PLAN
S-2	SECTIONS

END OF SECTION



GZA
Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

144 Elm Street
Amesbury, MA 01913
T: 781.278.4800
F: 978.834.6269
www.gza.com

October 27, 2017
File No. 18.0173456.00

Mr. Peter Ellison
TEC, Inc.
65 Glenn Street
Lawrence, Massachusetts

Re: Geotechnical Engineering Report
Proposed Kindergarten Facility
115 Phillips Brooks Road
North Andover, MA

Dear Mr. Ellison:

In accordance with our proposal dated October 10, 2017, GZA GeoEnvironmental, Inc. (GZA) is pleased to present this geotechnical report for the proposed Kindergarten Facility at the above Site to TEC, Inc. (Client; TEC). Our objectives were to evaluate subsurface conditions and to provide geotechnical recommendations for design and construction of the proposed kindergarten building to be located adjacent to the existing Early Childhood Center (ECC). The report is subject to the Limitations attached as **Appendix A** and the Terms and Conditions of our agreement. The elevations cited in this report are referenced to the North American Vertical Datum of 1988 (NAVD 88) datum and should be considered approximate.

BACKGROUND

Our understanding of the project is based on:

- Our conversation with Mr. Peter Ellison of TEC;
- An undated plan provided by TEC entitled "Proposed Kindergarten, Concept D";
- A civil site plan provided by TEC entitled "Grading and Drainage Plan," Sheet C-, and,
- Readily available on-line information, as well as on-line aerial photographs and topographic maps.

EXISTING CONDITIONS

The Site is located just to the north of the of the existing Early Childhood Center (ECC) near the intersection of Chickering Road (Route 125) and Beacon Hill Boulevard. The Site elevations range from approximately 165 feet to 190 feet. The location of the proposed kindergarten is currently occupied by driveways, grassy areas, and a parking lot adjacent to a baseball field. Historic aerial imagery indicates that the Site was likely either forested or used for agricultural purposes until the construction of the Middle School and associated athletic fields in the early 1960s.

PROPOSED DEVELOPMENT

The proposed construction consists of a one-story, modular-construction kindergarten building about 23,000 square feet in plan area connected to the existing, southerly adjoining, ECC building; along with associated driveways, parking lots, and a site retaining wall. The proposed finished floor elevation for the kindergarten building is elevation 186 feet. The existing grades range from about elevation 182 to 191 feet within the proposed building footprint.

The proposed driveways and parking areas vary in elevation from approximately elevation 190 feet to 166 feet. Cuts of up to about 5 feet below existing ground surface and fills of up to about 6 feet above existing ground surface will be required for the proposed site grading. A retaining wall is proposed to transition grades at the northern portion of the building from approximately 186 feet to 182 feet.

SCOPE OF SERVICES

GZA performed the following scope of work:

- Developed and executed a subsurface exploration program consisting of thirteen soil borings to evaluate soil and groundwater conditions.
- Performed gradation analyses on three soil samples collected from the borings to confirm field classifications and assist in evaluating potential on-site reuse of soils to be excavated during construction.
- Performed engineering analyses, developed geotechnical design and construction recommendations for the proposed building additions, and prepared this report summarizing our findings.

SUBSURFACE EXPLORATIONS

TEST BORINGS

New England Boring Contractors, Inc. of Derry, New Hampshire performed thirteen soil borings (GZ-1 through GZ-13) on October 19 and 20, 2017. The borings were performed in the existing paved parking areas and grassed areas to depths of between approximately 6 and 27 feet below ground surface (bgs). The borings were advanced with a track-mounted ATV drill rig using hollow stem augers. In general, Standard Penetration Tests were performed, and split spoon samples were obtained, continuously to a depth of 6 to 8 feet bgs and at 5-foot intervals thereafter. The borings were backfilled with drill cuttings and, when within a paved area, the surface patched with cold-patch asphalt.

A GZA representative observed the borings, classified the soil samples, and prepared the boring logs attached as **Appendix B**. The approximate boring locations are shown on **Figure 1**.

GEOTECHNICAL LABORATORY TESTING

Three soil samples obtained from the borings were submitted to Thielsch Laboratories in Cranston, Rhode Island, for gradation analysis to confirm field classifications and assist in evaluating on-site reuse of soils excavated during construction. Geotechnical laboratory test results are attached as **Appendix C**.

SUBSURFACE CONDITIONS

Subsurface soil conditions encountered in the borings generally consisted of Topsoil/Subsoil over Fill over a layer of Interbedded, Silty, Clay, Sand, and Gravel. All borings GZ-1 through GZ-13 were terminated in the Interbedded Silt, Clay, Sand, and Gravel at depths ranging between about 6 and 27 feet below ground surface.

The soil strata encountered in the borings are described below in further detail in order of increasing depth. The depths, thicknesses, and elevations referenced herein should be considered approximate. Refer to the borings logs for more detailed subsurface conditions at specific exploration locations.

Topsoil/Subsoil – Topsoil/Subsoil was encountered at the ground surface in borings GZ-2, GZ-4, and GZ-6 through GZ-11. The Topsoil/Subsoil was approximately 2 to 4 feet in thickness and generally consisted of tan to dark brown, fine to medium sand, with a visual estimate (based on weight) of up to 50 percent silt, and less than 10 percent organics/root fibers.

Fill – Existing Fill was encountered below the asphalt in borings GZ-1, GZ-3, GZ-5, GZ-12, and GZ-13. The asphalt ranged from approximately 5 to 7 inches in thickness at the borings performed in the existing paved areas. Fill was observed below the asphalt in all of the above-mentioned borings, ranging from approximately 1 to 3 feet below ground surface. The Fill generally consisted of gray to dark brown, fine sand, with a visual estimate (based on weight) of up to 50 percent gravel, up to 50 percent silt to silt & clay, and less than 10 percent asphalt.

Interbedded Silt, Clay, Sand, and Gravel – A layer of natural interbedded Silt, Clay, Sand, and Gravel was encountered below the Fill, Topsoil/Subsoil, or Sand in all the borings at depths ranging from 1 to 4 feet bgs, corresponding to elevations ranging between approximately El. 168.5 to El. 187.5 feet. This stratum generally consisted of interbedded layers of brown, gray, or dark gray, clayey silt to clay & silt or fine to coarse sand with various amounts of Gravel. Red to orange iron-oxide staining was also observed locally within this layer. SPT N-Values ranged from 17 to 100 bpf, indicating that the stratum was very stiff to hard or medium dense to very dense where the major component was clayey silt to clay & silt or sand, respectively. All borings GZ-1 through GZ-13 were terminated within this stratum at depths ranging from 6 to 27 feet bgs, corresponding to El. 158.4 to 178.7 feet. Boring GZ-1 was terminated at 23.6 feet bgs on auger and SPT refusal on a possible boulder or bedrock.

Drilling refusal was encountered at depths of 3 and 5.3 feet bgs at borings GZ-4 and GZ-7, respectively, on cobbles/ boulder. At each of the borings, the boring location was moved about 4 feet and tried again to advance the boring past the refusal depth. Repeated drilling refusals were encountered at boring GZ-2 at depth of 7 feet bgs on cobbles/boulders or possible bedrock.

GROUNDWATER

Groundwater readings were not taken in the borings during drilling. However, the water level within the borings was assumed to be greater than 10 feet below ground surface, where samples collected in the borings ranged from slightly moist to saturated as noted on the boring logs.

It should be noted that fluctuations in groundwater levels may occur due to variations in season, rainfall, site features and other factors different from those existing at the time of the explorations and measurements.

GEOTECHNICAL DESIGN RECOMMENDATIONS

The geotechnical design and construction recommendations presented below are based on our evaluation of the available data and design concepts provided to GZA and are subject to the limitations contained in **Appendix A**. References to the IBC refer to the International Building Code 2009 with Massachusetts State Building Code 8th Edition (MSBC) amendments.

FOUNDATION TYPE

We recommend a shallow foundation system consisting of spread and/or continuous footings bearing on natural interbedded Silt, Clay, Sand, and Gravel or on compacted Structural Fill placed over these natural strata, after removal of Topsoil/Subsoil, pavements, utilities, fill, and organic soil (where it exists). Structural Fill consists of imported Granular Fill or Sand-Gravel Fill. Recommended gradation requirements for Granular Fill and Sand-Gravel are presented in **Table 1**. Subgrade preparation recommendations and reuse of site soils are presented in the Construction section of this report.

The recommended maximum net allowable bearing pressures for spread or strip footings is 2 tons per square foot (tsf) on undisturbed natural interbedded Silt, Clay, Sand, and Gravel or on compacted Structural Fill placed over these natural strata. For foundations that are smaller than 3 feet wide, reduce the bearing value to one third of the above value multiplied by the least lateral footing dimension in feet. For footings supported on soil, continuous wall footings should be at least 18 inches wide; isolated footings at least 24 inches wide.

Where adjacent to the existing EEC building, new footings should bear at the same elevation of the existing footings such that the new footings do not impose load onto the existing footings and such that the existing footings are not undermined. Stepped wall footings should step up the slope at an overall slope no steeper than 1.5H:1V, with each step no greater than 2 feet in height. The bearing zone of new footings, described as including one foot out from the footing edge and down at a one-horizontal to one-vertical (1H:1V), should be below existing foundations.

For frost protection, exterior footings and interior footings in unheated areas should bear at least 4 feet below final exterior grades. Interior footings in heated areas should bear at least 1.5 feet below bottom of slab.

BUILDING SLAB

Slab-on-grade construction is recommended for typical floor slabs. A base course consisting of at least 6 inches of compacted Sand-Gravel Fill should be provided below the building slabs. Existing topsoil/subsoil and existing asphalt should be removed beneath the building footprint. The existing fill should be over-excavated to at least 2 feet below top-of-slab grade beneath proposed slab areas; any buried topsoil should be "chased out" in its entirety. The exposed subgrade should then be deep densified by proof-compaction and the excavated existing fill replaced, provided it can be compacted to the required density, or replaced by imported Granular Fill, Sand-Gravel fill or Crushed Stone wrapped in non-woven filter fabric.

SETTLEMENT

For new footings bearing on undisturbed natural interbedded Silt, Clay, Sand, and Gravel, or on Structural Fill placed over the undisturbed natural strata, total and differential post-construction settlements are estimated to be less than 1 inch and ½ inch, respectively, provided foundations are designed and constructed as recommended herein.

SEISMIC

Soils encountered in the building areas are generally not considered susceptible to liquefaction based on criteria set forth in Section 1806.4 of the MSBC. In accordance with Section 1613.5.2 of the IBC, we recommend that Site Class D be used for seismic design assuming that building foundations are designed and constructed as recommended herein. In accordance with Table 1604.11 of the MSBC, the design response spectra for proposed buildings should be constructed using the following parameters:

S_s = 0.33	S_1 = 0.075
S_{DS} = 0.352g	S_{D1} = 0.120g

where:

- SS and SDS are the spectral acceleration and design spectral response acceleration parameters at 0.2-second period, respectively; and
- S1 and SD1 are the spectral acceleration and design spectral response acceleration parameters at 1.0-second period, respectively.

LATERAL EARTH PRESSURES

Site retaining walls and foundation retaining walls (if any) should be designed to resist lateral earth pressures. For site retaining walls (active conditions), use an equivalent fluid density of 40 pounds per cubic foot (pcf) to calculate lateral earth pressures. For foundation retaining walls (rigid walls, at-rest pressures), use an equivalent fluid density of 65 pcf. The above-recommended equivalent fluid densities assume that backfill will be placed horizontally behind the walls (that is, no sloping backfill), that the walls are backfilled with free draining soils such as Granular Fill (provided that it has less than 8 percent passing sieve No. 200) or Sand-Gravel Fill within at least 3 feet of the walls and are drained so that no water pressure develops behind the wall. Where the calculated earth pressure behind walls is less than 250 pounds per square foot (psf), it should be increased to 250 psf to account for stresses created by compaction within 5 feet of the wall. Walls should also be designed for appropriate sloping backfill, surcharge (for example, floor loads or traffic loads) and seismic loads per Section 1612.4.9 of the IBC.

We recommend using a coefficient of friction of 0.35 to resist sliding between mass concrete and bearing materials. In addition to sliding resistance, foundation walls may be designed to resist lateral loads with the passive resistance of soil provided that the soil will not be removed from the front of the wall. We recommend using an equivalent fluid pressure of 180 pcf to calculate the passive resistance of soils. The top one foot of soil should be neglected when calculating passive pressures. The minimum factors of safety for sliding and overturning under static loads should be 1.5.

Backfill placed within 3 feet of site retaining walls and foundation retaining walls should be free-draining Sand-Gravel (refer to **Table 1**). Compaction within 5 feet of retaining walls should be performed using a walk-behind vibratory plate compactor.

The wall designer should be a licensed Professional Engineer in the Commonwealth of Massachusetts. The design should include an evaluation of global stability as well as the internal stability of the wall. We recommend that the wall design should be submitted to the project geotechnical engineer for review before construction.

PAVEMENT DESIGN

GZA recommends the following minimum asphalt pavement sections for the proposed development.

	Light Duty Pavement (car only parking)	Heavy Duty Pavement (bus, truck traffic, entrance-ways)
Asphalt Surface (in.)	1.5	1.5
Asphalt Binder (in.)	1.5	2.5
Sand and Gravel Base (in.)	10	16

In rigid pavement (exterior concrete slab-on-grade) areas, such as dumpster pad and loading dock approach areas, provide at least 18 inches of sand-gravel fill or ¾-inch crushed stone (underlain by non-woven filter fabric) base course. Concrete thickness should be at least 6 inches and designed by the project structural engineer. Recommended graduation requirements for Sand-Gravel Fill are presented in **Table 1**.

CONSTRUCTION CONSIDERATIONS

BUILDING SUBGRADE PREPARATION

Footing Subgrade

Prior to fill placement, pavement, utilities, vegetation, and topsoil/subsoil should be removed throughout the building footprint. Existing fill should be removed to at least 2 feet below top of slab, subject to adequate proof compaction at that grade. In addition, existing fill should be removed from below the bearing zone of proposed building footings to undisturbed naturally deposited soil. The bearing zone is defined as the zone extending at a 1H:1V sloping down and outward from 1 foot outside the bottom edges of the footing.

Final excavations to footing subgrade should not be made until the areas are ready for fill or concrete placement. Footing locations should be excavated to the bottom of footing elevation with a smooth-edged bucket to mitigate disturbance of the subgrade. Loose or disturbed material should be removed by hand. After excavation to footing subgrade and assuming all work is performed "in the dry", as recommended herein, footing subgrade soils should be proof-compacted prior to fill or concrete placement with at least six passes of a large vibratory plate compactor. Weak or soft spots identified during proof-compaction should be over-excavated and replaced with compacted Structural Fill. In some areas, predominantly fine-grained (cohesive) soils are anticipated at footing subgrade level. To protect the subgrades from disturbance, we recommend at least 6-inches of Sand-Gravel or 4-inches of ¾-inch Crushed Stone be placed. Crushed stone placed in greater than a 4-inch-thickness should be wrapped in non-woven filter fabric. If soils become disturbed they will need to be over-excavated and replaced with compacted structural fill.

Slab Subgrade

Existing fill may be left in place where greater than 2 feet below slab elevation, provided the fill is stable when proof-compacted with at least six passes of a large vibratory drum roller (minimum static weight of 10,000 pounds). Over-excavate any weak or soft spots identified during proof-compaction and replace with compacted Sand-Gravel Fill. Recommended gradation requirements are presented in **Table 1**. If an organic layer or buried topsoil/subsoil is observed during foundation or other deeper excavations below the fill within the building footprints, the organic soil should be removed from below the slab area.

PAVEMENT SUBGRADE

Within new pavement areas (both bituminous concrete and concrete slab-on-grades), remove all existing topsoil/subsoil and remove fill to the minimum depth required to accommodate Finish, Binder and Sand-Gravel Fill base courses. Existing fill below pavement base course may be left in place provided the subgrade is proof-compacted with a minimum of six passes of a vibratory drum roller (with a minimum static drum weight of 10,000-pounds capable of at least 20,000 pounds of dynamic force). Weak or soft spots identified during proof-compaction should be over-excavated and replaced with compacted Structural Fill.

In existing pavement areas, the pavement may be processed and incorporated into the pavement base course, provided the processed material meets the gradation of Sand-Gravel. Crushed pavement should not be reused in the building area.

FILL MATERIAL AND COMPACTION

Gradation requirements for various fill materials and their recommended uses are provided in **Table 1**. Fill placed in the upper 3 feet of the proposed building areas should have a maximum particle size of 3 inches. The recommended minimum compaction for Structural Fill, based on percentage of maximum dry density as defined by ASTM D-1557 is specified below for different areas. Crushed Stone should be placed in maximum 6-inch-thick lifts and compacted to an unyielding surface.

Fill Area	Percent of Maximum Dry Density
Within Building Areas and 1H:1V Bearing Zone of Footings	95
Beneath Pavement (upper 2 feet)	95
More than 2 feet below Pavement	92
Outside Building & Adjacent to Exterior Building Foundations	92
Beneath Landscape Areas	90

Extra care should be used when compacting adjacent to walls. Where walls are buried on both sides, backfill and compaction should proceed on both sides of the wall so that the difference in top of fill on either side of the wall does not exceed 2 feet. Where buried walls are backfilled only on one side, only hand-operated rollers or plate compactors weighing not more than 250 pounds should be used within a lateral distance of 5 feet of walls. Refer to **Table 2** for minimum recommended compaction methods.

Frozen soil should not be placed as fill. In addition, fill should not be placed over frozen soil. Protect footings, slabs and footing and slab subgrades from frost at all times during construction.

REUSE OF EXISTING ON-SITE MATERIALS

Existing Pavement

Existing pavement may be pulverized or crushed and reused on-site as fill within proposed pavement areas, provided appropriate gradation criteria are met. Crushed pavement should not be used within building areas.

Existing Fill/Natural Granular Soil

Based on visual and laboratory classifications, some existing fill or natural Sand may meet the recommended gradation requirements for Granular Fill or Common Fill. As such, the fill or the natural granular soil may be suitable for reuse provided it is free of organics and can be compacted to the degree required herein. It should be noted that some of the on-site natural soils contain more than 20 percent silt/clay, and handling, placement, and compaction of soil with a high silt/clay content may be difficult, especially during cold temperatures or when wet. To re-use some fine-grained soils excavated from on site, it may be necessary to blend or sandwich layers of off-site Sand-Gravel.

Existing Topsoil/Subsoil

Existing topsoil/subsoil may be screened and reused in landscape areas or in other non-load bearing applications.

Excess Soils

Excess soil generated during construction that cannot be reused on site should be disposed of off-site in accordance with applicable local, state, and federal regulations.

CONSTRUCTION DEWATERING

Excavation for footings are not anticipated to extend below the groundwater table. However, if groundwater is encountered, construction dewatering will be required to help control groundwater and to conduct work "in the dry." Based on our review of existing soil conditions, this should be able to be achieved with localized sump pumps with discharge on-site into excavated pits located outside of the building area.

In addition, water that collects from precipitation events may also impact construction. It is recommended that temporary control measures be implemented to reduce the amount of surface water (from rainfall runoff) from potentially entering and ponding in the excavations. Temporary measures should include, but not be limited to, construction of drainage ditches to divert and/or reduce the amount of surface water flowing over exposed subgrades during construction.

TEMPORARY EXCAVATION SUPPORT

Temporary excavation support may be required to limit the extent of excavation. The temporary excavation support system should be designed and stamped by a registered Professional Engineer in the Commonwealth of Massachusetts and submitted to GZA for review prior to construction.

The Owner and the Contractor should make themselves aware of and become familiar with applicable local, state, and federal safety regulations, including the current Occupational Safety and Health Administration (OSHA) Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. The Contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations, e.g.; OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

As a safety measure, it is recommended that all vehicles and soil piles be kept a minimum lateral distance from the crest of the slope equal to no less than the slope height. Exposed slope faces should also be protected against the elements.

FINAL DESIGN AND CONSTRUCTION

We trust the information presented herein is sufficient for your use in the design of the proposed building. We recommend that GZA be retained for the following additional services:

- Prepare geotechnical specifications; specifically earthwork.
- Review near-final design foundation and grading plans for conformance with our recommendations and understanding of the project.
- Review Contractor's geotechnical-related submittals for general conformance with our recommendations and the project foundation plans and geotechnical specifications.
- Observe and document earthwork and footing subgrade preparation for conformance with our recommendations and the project foundation plans. The MSBC requires that a Professional Engineer (P.E.) registered in Massachusetts (or the P.E.'s representative) observe and document foundation installation and fill placement in building areas.

CLOSING

We thank you for the opportunity to work on this project and would look forward to our continued involvement. Please do not hesitate to contact the undersigned if you have any questions.

Very truly yours,

GZA GEOENVIRONME NTAL, INC.

Michael P. Smith, P.E.
Project Manager

Bruce W. Fairless, P.E.
Consultant/Reviewer

Frank S. Vetere, P.E., L.S.P.
Principal

Attachments: Tables
Figure
Appendix A - Limitations
Appendix B –Boring Logs
Appendix C – Geotechnical Laboratory Test Results

Tables

TEC, Inc.
Proposed Kindergarten Facility
115 Phillips Brook Road
North Andover, Massachusetts

TABLE 1
RECOMMENDED USE AND GRADATION CRITERIA FOR IMPORTED FILL MATERIALS

Granular Fill: Within building areas to raise site grades below mat foundation base course, below pavement base course.

Sand-Gravel: For use as mat foundation and pavement base course, as backfill within 5 feet laterally of retaining walls, and for use as pipe bedding for drainage and sewer utilities/structures (unless otherwise specifed by the utility owner).

Crushed Stone: For use in bottom of excavations to aid in construction dewatering and maintaining subgrade stability during wet conditions, backfill behind walls, and in confined areas.

Ordinary Fill: For use outside building limits in areas more than 5 feet away from walls, more than 2 feet below bottom of pavement and in general landscape areas.

GRADATION REQUIREMENTS

Sieve Size	Percent Finer by Weight
Granular Fill — shall be free from ice and snow, roots, sod, rubbish and other deleterious or organic matter. Structural Fill shall conform to the following gradation requirements:	
2/3 of the loose lift thickness	100
No. 10	30 - 95
No. 40	10 - 70
No. 200	*0 - 15 * 0 -8 for backfill behind walls
Sand-Gravel — shall consist of durable sand and gravel and shall be free from ice and snow, roots, sod, rubbish and other deleterious or organic matter. Sand-Gravel shall conform to the following gradation requirements:	
3 inch* *1-1/2 inch when used as pipe bedding	100
1/2 inch	50 - 85
No. 4	40 - 75
No. 40	10 - 35
No. 200	0 - 8
Crushed Stone — shall consist of durable crushed rock or durable crushed gravel stone and shall be free from ice and snow, clay, loam and other deleterious material. Crushed Stone shall conform to the following gradation requirements:	
1 inch	100
3/4 inch	90 - 100
1/2 inch	10 - 50
3/8 inch	0 - 20
No. 4	0 - 5
Ordinary Fill — Ordinary Fill shall be free from trash, ice, snow, tree stumps, roots, organic materials, and other deleterious matter. Ordinary Fill shall contain no stone greater than two-thirds (2/3) the loose lift thickness with a maximum stone size of six (6) inches in diameter and contain no more than 30% passing the No. 200 sieve. It shall have physical properties such that it can be readily spread and compacted during filling.	

File No. 18.0173456.00
October 2017

TEC, Inc.
Proposed Kindergarten Facility
115 Phillips Brook Rd
North Andover, Massachusetts

TABLE 2
RECOMMENDED COMPACTION METHODS

Compaction Method	Maximum Stone Size*	Maximum Loose Lift Thickness		Minimum Number of Passes	
		Below Structures and Pavement	Less Critical Area	Below Structures and Pavement	Less Critical Area
GRANULAR FILL, SAND-GRAVEL FILL, CRUSHED STONE **					
Hand-operated vibratory plate or light roller in confined areas	4"	6"	8"	4	4
Hand-operated vibratory drum rollers weighing at least 1,000# in confined areas	6"	10"	12"	4	4
Light vibratory drum roller minimum weight at drum 3,000# minimum dynamic force 10,000#	8"	12"	18"	4	4
Medium vibratory drum roller minimum weight at drum 10,000# minimum dynamic force 20,000#	8"	18"	24"	6	6

*And no more than two-thirds (2/3) loose lift thickness.

** Crushed Stone greater than 4 inches in thickness should be enveloped on all sides with non-woven filter fabric (Mirafi 140N or equivalent).

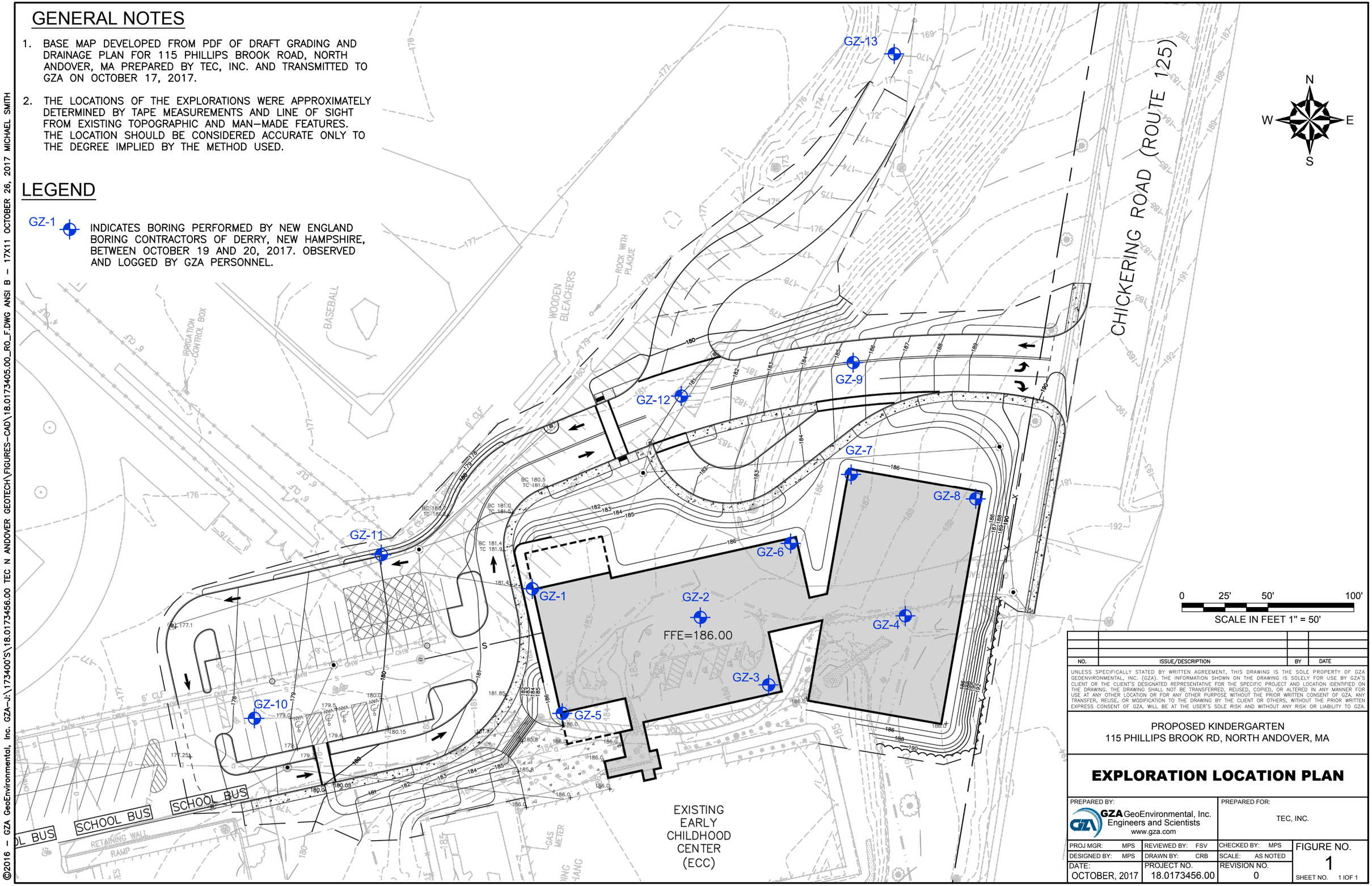
Figure

GENERAL NOTES

1. BASE MAP DEVELOPED FROM PDF OF DRAFT GRADING AND DRAINAGE PLAN FOR 115 PHILLIPS BROOK ROAD, NORTH ANDOVER, MA PREPARED BY TEC, INC. AND TRANSMITTED TO GZA ON OCTOBER 17, 2017.
2. THE LOCATIONS OF THE EXPLORATIONS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENTS AND LINE OF SIGHT FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THE LOCATION SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

LEGEND

GZ-1 INDICATES BORING PERFORMED BY NEW ENGLAND BORING CONTRACTORS OF DERRY, NEW HAMPSHIRE, BETWEEN OCTOBER 19 AND 20, 2017. OBSERVED AND LOGGED BY GZA PERSONNEL.



NO.	ISSUE/DESCRIPTION	BY	DATE

PROPOSED KINDERGARTEN
115 PHILLIPS BROOK RD, NORTH ANDOVER, MA

EXPLORATION LOCATION PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: TEC, INC.	
PROJ MGR: MPS	REVIEWED BY: FSV	CHECKED BY: MPS	FIGURE NO. 1
DESIGNED BY: MPS	DRAWN BY: CRB	SCALE: AS NOTED	
DATE: OCTOBER, 2017	PROJECT NO. 18.0173456.00	REVISION NO. 0	SHEET NO. 1 OF 1

Appendix A – Limitations

USE OF REPORT

1. GZA GeoEnvironmnetal, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of TEC, Inc. (Client) for the stated purpose(s) and location(s) identified in the Agreement and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the current available information as part of the Scope of Services set forth in Agreement and/or Report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions. The findings in this report will be revised based on additional subsurface explorations performed as part of final design.

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our report are based on widely-spaced subsurface explorations performed by others and are intended only to convey trends in subsurface conditions. GZA cannot be responsible for the accuracy of the data. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs.

6. In preparing this report, GZA relied on certain information provided by Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

7. Water level readings have been made in test holes at the specified times and under the stated conditions. GZA cannot be responsible for the accuracy of the data. These data have been reviewed and interpretations have been made in this report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the report.

8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. The project's Licesnsed Site Professional shall be responsible for considering the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

ADDITIONAL SERVICES

11. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

Appendix B – Boring Logs

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-1
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring	**Type of Rig:** ATV	**Boring Location:** See Plan	**H. Datum:** -
Foreman: Matt Stone	**Rig Model:** Diedrich D-90	**Ground Surface Elev. (ft.):** 182	
Logged By: Dan Sanfilippo	**Drilling Method:** HSA	**Final Boring Depth (ft.):** 23.6	
		Date Start - Finish: 10/19/2017 - 10/19/2017	**V. Datum:** NAVD88

Auger/Casing Type: HSA	**Sampler Type:** Split Spoon		
I.D/O.D.(in): 2.75/6.125	**I.D./O.D. (in.):** 1.375/2		
Hammer Weight (lb.): -	**Sampler Hmr Wt (lb):** 140		
Hammer Fall (in.): -	**Sampler Hmr Fall (in):** 30		
Other: -	**Other:** Safety Hammer		

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
									1		0.6'	ASPHALT	181.4'
		S-1	1-3	24	23	8 12 12 22	24	S-1: Medium dense, grey/dark brown, fine to medium SAND, some Silt, little Gravel trace Asphalt.	2			FILL	
		S-2	3-5	24	20	17 24 24 28	48	S-2: Dense, grey, fine SAND and Clayey SILT, little Gravel. (Rust-colored soil mottling observed)			3'		179.0'
5		S-3	5-7	24	20	9 17 17 16	34	S-3: Hard, brown, Clayey SILT and fine SAND, little Gravel.					
									3				
10		S-4	10-12	24	24	7 12 14 16	26	S-4: Very stiff, brown, SILT & CLAY and fine to medium SAND, little Gravel.				INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
15		S-5	15-17	24	21	10 18 19 26	37	S-5: Dense, brown, fine to medium SAND and SILT & CLAY, trace Gravel.					
20		S-6	20-22	24	19	9 15 30 23	45	S-6: Dense, brown, fine to medium SAND and CLAY & SILT, trace Gravel.	4				
		S-7	23.5-23.6	1	0	100/1"	R	S-7: No recovery.	5		23.6'		158.4'
25								Bottom of boring at 23.6 feet.					
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Advanced HSA from ground surface to approximately 7 inches below ground surface (bgs) through Ashpalt pavement prior to obtaining sample S-1.
3. Increased drill effort observed from approximately 7.5 to 10 feet bgs.
4. Auger refusal observed at approximately 23.5 feet bgs. Subsequent split spoon refusal encountered within sample S-7.
5. Boring terminated at approximately 23.6 feet bgs. Upon completion, borehole backfilled with drill cuttings and ground surface finished with cold patch Asphalt.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-1

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-2
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring	**Type of Rig:** ATV	**Boring Location:** See Plan	**H. Datum:** -
Foreman: Matt Stone	**Rig Model:** Diedrich D-90	**Ground Surface Elev. (ft.):** 186	
Logged By: Dan Sanfilippo	**Drilling Method:** HSA	**Final Boring Depth (ft.):** 7.3	
		Date Start - Finish: 10/19/2017 - 10/19/2017	**V. Datum:** NAVD88

Auger/Casing Type: HSA	**Sampler Type:** Split Spoon		
I.D/O.D.(in): 2.75/6.125	**I.D./O.D. (in.):** 1.375/2		
Hammer Weight (lb.): -	**Sampler Hmr Wt (lb):** 140		
Hammer Fall (in.): -	**Sampler Hmr Fall (in):** 30		
Other: -	**Other:** Safety Hammer		

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	22	10 15 16 10	31	S-1: Dense, tan/brown, fine to medium SAND, some Silt, trace Asphalt, trace Gravel, trace Organic Fibers. (Rust-colored soil mottling observed)	1			TOPSOIL/SUBSOIL	
		S-2	2-4	24	21	17 25 39 34	64	S-2: Hard, grey/brown, SILT & CLAY and fine to medium SAND, little Gravel. (Rust-colored soil mottling observed)			2'		184.0'
5		S-3	4-6	24	18	30 38 32 28	70	S-3: Hard, grey, SILT & CLAY, some fine Sand, little Gravel.	2 3 4 5			INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
		S-4	7-7.3	4	0	100/4"	R	S-4: No recovery.			7.3'		178.7'
								Bottom of boring at 7.3 feet.					
10													
15													
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Boring location offset approximately 6 ft southwest.
3. Increased drill effort observed from approximately 6 to 7 feet below ground surface (bgs).
4. Auger refusal observed at approximately 7 feet bgs. Split spoon refusal encountered at approximately 7.3 feet bgs.
5. Borehole offset approximately 4 feet east of the previous location. Auger refusal observed at approximately 2 to 3 feet bgs at offset location. Therefore, boring terminated and borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-2

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-3
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring	**Type of Rig:** ATV	**Boring Location:** See Plan	**H. Datum:** -
Foreman: Matt Stone	**Rig Model:** Diedrich D-90	**Ground Surface Elev. (ft.):** 187	
Logged By: Dan Sanfilippo	**Drilling Method:** HSA	**Final Boring Depth (ft.):** 17	
		Date Start - Finish: 10/19/2017 - 10/19/2017	**V. Datum:** NAVD88

Auger/Casing Type: HSA	**Sampler Type:** Split Spoon	**Groundwater Depth (ft.)**	
I.D/O.D.(in): 2.75/6.125	**I.D./O.D. (in.):** 1.375/2		
Hammer Weight (lb.): -	**Sampler Hmr Wt (lb):** 140		
Hammer Fall (in.): -	**Sampler Hmr Fall (in):** 30		
Other: -	**Other:** Safety Hammer		

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured	(see note 3).		

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
											0.4'	ASPHALT	186.6'
		S-1	1-3	24	21	12 19 9 15	28	S-1: Very stiff, grey/tan, SILT & CLAY and fine SAND, trace Gravel. (Rust-colored soil mottling observed)	1 2			FILL	
		S-2	3-5	24	19	21 22 36 32	58	S-2: Hard, grey/brown, SILT & CLAY, some fine to medium SAND, trace Gravel.			3'		184.0'
5		S-3	5-7	24	9	39 26 30 35	56	S-3: Hard, grey/brown, SILT & CLAY and fine to coarse SAND, little Gravel.					
10		S-4	10-12	24	21	26 18 12 22	30	S-4: Hard, brown, SILT and fine to coarse SAND, trace Gravel.	3			INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
15		S-5	15-17	24	22	15 20 25 36	45	S-5: Hard, brown, CLAY & SILT, some fine to medium Sand, little Gravel.	4		17'		170.0'
								Bottom of boring at 17 feet.					
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Advanced HSA from ground surface to approximately 5 inches below ground surface (bgs) through Ashpalt pavement prior to obtaining sample S-1.
3. Samples S-4 and S-5 observed to be saturated.
4. Boring terminated at approximately 17 feet below ground surface. Upon completion, borehole backfilled with drill cuttings and ground surface finished with cold patch Asphalt.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-3

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-4
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring
Foreman: Matt Stone
Logged By: Dan Sanfilippo

Type of Rig: ATV
Rig Model: Diedrich D-90
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 189
Final Boring Depth (ft.): 17
Date Start - Finish: 10/19/2017 - 10/19/2017

H. Datum: -
V. Datum: NAVD88

Auger/Casing Type: HSA
I.D/O.D.(in): 2.75/6.125
Hammer Weight (lb.): -
Hammer Fall (in.): -
Other: -

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Safety Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	5	2 3 4 6	7	S-1: Loose, dark brown, fine to medium SAND, some Silt, little Gravel, trace Organic Fibers.	1				
		S-2	2-2.9	11	7	9 100/5"	R	S-2: Loose, tan, fine to medium SAND, little Silt, trace Gravel, trace Organic Fibers.	2			TOPSOIL/SUBSOIL	
											3.5'		185.5'
5		S-3	4-6	24	12	10 11 10 16	21	S-3: Very stiff, brown/grey, CLAY & SILT and fine to medium SAND, little Gravel. (Rust-colored soil mottling observed)					
10		S-4	10-12	24	14	5 13 18 26	31	S-4: Dense, brown/grey, GRAVEL, some fine to coarse Sand, little Clayey Silt.				INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
15		S-5	15-17	24	20	26 41 28 36	69	S-5: Very dense, grey/brown, GRAVEL and SILT & CLAY, some fine to coarse Sand. (Rust-colored soil mottling observed)	3 4		17'		172.0'
								Bottom of boring at 17 feet.					
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Split spoon refusal observed at approximately 2.9 feet below ground surface (bgs). Boring offset approximately 4 feet to the west and advanced to approximately 4 feet bgs prior to obtaining sample S-3.
3. Approximately 4 inches of Rock Fragments observed within split spoon sample S-5 indicating probable nested Cobble.
4. Boring terminated at approximately 17 feet below ground surface and borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-4

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-5
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring
Foreman: Matt Stone
Logged By: Dan Sanfilippo

Type of Rig: ATV
Rig Model: Diedrich D-90
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 183
Final Boring Depth (ft.): 17
Date Start - Finish: 10/19/2017 - 10/19/2017

H. Datum: -
V. Datum: NAVD88

Auger/Casing Type: HSA
I.D/O.D.(in): 2.75/6.125
Hammer Weight (lb.): -
Hammer Fall (in.): -
Other: -

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Safety Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured	(see note 3).		

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
									1		0.5'	ASPHALT	182.5'
		S-1	1-3	24	11	4 6 8 8	14	S-1: Medium dense, dark brown, fine SAND and Clayey SILT, some Gravel.	2			FILL	
		S-2	3-5	24	21	11 19 28 21	47	S-2: Hard, grey/brown, Clayey SILT and fine to medium SAND, little Gravel. (Rust-colored soil mottling observed)			3'		180.0'
5		S-3	5-7	24	23	8 9 12 17	21	S-3: Very stiff, brown, SILT & CLAY and fine SAND, trace Gravel. (Rust-colored soil mottling observed)					
10		S-4	10-12	24	19	12 14 12 18	26	S-4: Medium dense, brown, fine to medium SAND and SILT & CLAY, trace Gravel.				INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
15		S-5	15-17	24	20	11 16 15 20	31	S-5: Hard, brown, Silty CLAY, some fine to medium Sand, little Gravel.	3				
									4		17'		166.0'
20								Bottom of boring at 17 feet.					
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Advanced HSA from ground surface to approximately 6 inches below ground surface (bgs) through Ashpalt pavement prior to obtaining sample S-1.
3. Sample S-5 observed to be saturated.
4. Boring terminated at approximately 17 feet below ground surface. Upon completion, borehole backfilled with drill cuttings and ground surface finished with cold patch Asphalt.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-5

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-6
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring	**Type of Rig:** ATV	**Boring Location:** See Plan	**H. Datum:** -
Foreman: Matt Stone	**Rig Model:** Diedrich D-90	**Ground Surface Elev. (ft.):** 186	
Logged By: Dan Sanfilippo	**Drilling Method:** HSA	**Final Boring Depth (ft.):** 17	
		Date Start - Finish: 10/19/2017 - 10/19/2017	**V. Datum:** NAVD88

Auger/Casing Type: HSA	**Sampler Type:** Split Spoon		
I.D/O.D.(in): 2.75/6.125	**I.D./O.D. (in.):** 1.375/2		
Hammer Weight (lb.): -	**Sampler Hmr Wt (lb):** 140		
Hammer Fall (in.): -	**Sampler Hmr Fall (in):** 30		
Other: -	**Other:** Safety Hammer		

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured	(see note 2).		

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	20	5 4 5 5	9	S-1: Loose, brown/black, fine to medium SAND, little Gravel, little Silt, trace Organic Fibers.	1			TOPSOIL/SUBSOIL	
		S-2	2-4	24	20	11 16 17 23	33	S-2: Top 3": Tan/brown, SILT & CLAY, little fine Sand, trace Gravel, trace Organics. (Rust-colored soil mottling observed)			2.3'		183.7'
5		S-3	4-6	24	21	9 10 12 17	22	Bottom 17": Grey/brown, SILT & CLAY and fine SAND, little Gravel. (Rust-colored soil mottling observed) S-3: Very stiff, brown, SILT & CLAY, some fine to medium Sand, trace Gravel.					
10		S-4	10-12	24	18	4 7 10 12	17	S-4: Very stiff, brown, CLAY & SILT, some fine to medium Sand, trace Gravel.	2			INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
15		S-5	15-17	24	3	10 20 31 26	51	S-5: Very dense, grey/brown, GRAVEL, some fine to coarse Sand, little Clayey Silt. (Gravel in tip of spoon)	3		17'		169.0'
								Bottom of boring at 17 feet.					
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Sample S-4 observed to be saturated.
3. Boring terminated at approximately 17 feet below ground surface. Upon completion, borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-6

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-7
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring
Foreman: Matt Stone
Logged By: Dan Sanfilippo

Type of Rig: ATV
Rig Model: Diedrich D-90
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 186.5
Final Boring Depth (ft.): 17
Date Start - Finish: 10/19/2017 - 10/19/2017

H. Datum: -
V. Datum: NAVD88

Auger/Casing Type: HSA
I.D/O.D.(in): 2.75/6.125
Hammer Weight (lb.): -
Hammer Fall (in.): -
Other: -

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Safety Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured	(see note 3).		

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	16	3 5 6 7	11	S-1: Top 6": Dark brown, fine to coarse SAND & SILT, little Gravel, trace Organic Fibers. Bottom 10": Grey/brown, fine to medium SAND, little Silt, trace Gravel.	1			TOPSOIL/SUBSOIL	
		S-2	2-4	24	16	7 9 11 12	20	S-2: Medium dense, brown, fine to coarse SAND, little Clayey Silt, trace Gravel. (Rust-colored soil mottling observed)			2'		184.5'
5		S-3	4-5.3	15	11	6 6 100/3"	R	S-3: Medium dense, grey/brown, fine to coarse SAND, some Gravel, little Silt & Clay. (Rust-colored soil mottling observed)	2				
10		S-4	10-12	24	13	7 11 11 15	22	S-4: Medium dense, brown, GRAVEL, some fine to coarse Sand, little Clayey Silt.	3 4			INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
15		S-5	15-17	24	19	41 19 29 25	48	S-5: Hard, grey/brown, CLAY & SILT and fine to medium SAND, little Gravel.	5		17'		169.5'
								Bottom of boring at 17 feet.					
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Split spoon refusal observed at approximately 5 feet below ground surface (bgs). Boring offset approximately 4 feet to the northeast and advanced to approximately 10 feet bgs prior to obstaining sample S-4.
3. Sample S-4 observed to be saturated.
4. Increased in drilling effort observed from approximately 13.5 to 15 feet bgs.
5. Boring terminated at approximately 17 feet below ground surface. Upon completion, borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-7

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-8
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring
Foreman: Matt Stone
Logged By: Dan Sanfilippo

Type of Rig: ATV
Rig Model: Diedrich D-90
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 189.5
Final Boring Depth (ft.): 27
Date Start - Finish: 10/19/2017 - 10/20/2017

H. Datum: -
V. Datum: NAVD88

Auger/Casing Type: HSA
I.D/O.D.(in): 2.75/6.125
Hammer Weight (lb.): -
Hammer Fall (in.): -
Other: -

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Safety Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	16	6 7 7 13	14	S-1: Top 7": Dark brown, fine SAND, little Silt, little Gravel, trace Organic Fibers. Bottom 9": Brown/tan, fine to medium SAND, some Silt, little Gravel, trace Organic Fibers.	1			TOPSOIL/SUBSOIL	
		S-2	2-4	24	19	11 12 13 14	25	S-2: Medium dense, tan, fine SAND, some Gravel, little Clayey Silt.			2'		187.5'
5		S-3	4-6	24	19	13 18 19 15	37	S-3: Dense, brown, fine to medium SAND and SILT, trace Gravel.					
10		S-4	10-12	24	20	7 13 23 29	36	S-4: Hard, brown, SILT & CLAY, some fine Sand, little Gravel.					
15		S-5	15-17	24	20	12 16 24 32	40	S-5: Dense, grey/brown, GRAVEL, some fine to medium Sand, some Silt & Clay. (Rust-colored soil mottling observed)				INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
20		S-6	20-22	24	21	17 35 39 40	74	S-6: Very dense, grey, fine to coarse SAND, some Gravel, little Clay & Silt.	2				
25		S-7	25-27	24	17	19 31 21 27	52	S-7: Very dense, dark grey, fine to coarse SAND, little Gravel, little Clay & Silt.	3		27'		162.5'
30								Bottom of boring at 27 feet.					

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Increase in drill effort observed from approximately 22 to 23 feet, and 24 to 25 feet bgs.
3. Boring terminated at approximately 27 feet below ground surface. Upon completion, borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-8

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-9
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring
Foreman: Matt Stone
Logged By: Dan Sanfilippo

Type of Rig: ATV
Rig Model: Diedrich D-90
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 185.5
Final Boring Depth (ft.): 8
Date Start - Finish: 10/20/2017 - 10/20/2017

H. Datum: -
V. Datum: NAVD88

Auger/Casing Type: HSA
I.D/O.D.(in): 2.75/6.125
Hammer Weight (lb.): -
Hammer Fall (in.): -
Other: -

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Safety Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	14	3 4 4 6	8	S-1: Top 10": Dark brown, fine SAND, little Silt, trace Gravel, trace Organic Fibers. Bottom 4": Tan, fine SAND, some Silt, trace Gravel.	1			TOPSOIL/SUBSOIL	
		S-2	2-4	24	18	6 8 14 46	22	S-2: Top 14": Tan, fine SAND and SILT & CLAY, little Gravel. (Rust-colored soil mottling observed) Bottom 4": Light grey, GRAVEL and fine to coarse SAND, trace Silt.			2'		183.5'
5		S-3	4-6	24	21	15 16 12 28	28	S-3: Medium dense, tan, fine to coarse SAND, some Silt & Clay, little Gravel. (Rust-colored soil mottling observed)				INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
		S-4	6-8	24	18	14 20 17 18	37	S-4: Dense, grey/brown, fine to coarse SAND, some Silt & Clay, some Gravel.	2		8'		177.5'
10								Bottom of boring at 8 feet.					
15													
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Boring terminated at approximately 7.5 feet below ground surface. Upon completion, borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-9

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-10
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring	**Type of Rig:** ATV	**Boring Location:** See Plan	**H. Datum:** -
Foreman: Matt Stone	**Rig Model:** Diedrich D-90	**Ground Surface Elev. (ft.):** 178	
Logged By: Dan Sanfilippo	**Drilling Method:** HSA	**Final Boring Depth (ft.):** 6	
		Date Start - Finish: 10/20/2017 - 10/20/2017	**V. Datum:** NAVD88

Auger/Casing Type: HSA	**Sampler Type:** Split Spoon	
I.D/O.D.(in): 2.75/6.125	**I.D./O.D. (in.):** 1.375/2	
Hammer Weight (lb.): -	**Sampler Hmr Wt (lb):** 140	
Hammer Fall (in.): -	**Sampler Hmr Fall (in):** 30	
Other: -	**Other:** Safety Hammer	

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	15	17 18 11 7	29	S-1: Medium dense, brown/dark brown, fine to coarse SAND, some Clayey Silt, little Gravel, trace Organic Fibers.	1			TOPSOIL/SUBSOIL	
		S-2	2-4	24	18	7 10 17 22	27	S-2: Medium dense, grey/brown, fine to coarse SAND, some Gravel, little Clayey Silt. (Rust-colored soil mottling observed)			2'		176.0'
5		S-3	4-6	24	19	28 32 36 38	68	S-3: Very dense, grey/brown,fine to medium SAND, some Clay & Silt, little Gravel.	2			INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
								Bottom of boring at 6 feet.			6'		172.0'
10													
15													
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Boring terminated at approximately 6 feet below ground surface. Upon completion, borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-10

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-11
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring
Foreman: Matt Stone
Logged By: Dan Sanfilippo

Type of Rig: ATV
Rig Model: Diedrich D-90
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 179.5
Final Boring Depth (ft.): 10
Date Start - Finish: 10/20/2017 - 10/20/2017

H. Datum: -
V. Datum: NAVD88

Auger/Casing Type: HSA
I.D/O.D.(in): 2.75/6.125
Hammer Weight (lb.): -
Hammer Fall (in.): -
Other: -

Sampler Type: Split Spoon
I.D./O.D. (in.): 1.375/2
Sampler Hmr Wt (lb): 140
Sampler Hmr Fall (in): 30
Other: Safety Hammer

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		S-1	0-2	24	16	3 4 5 9	9	S-1: Loose, brown, fine SAND, some Silt, trace Gravel, trace Organic Fibers.	1				
		S-2	2-4	24	17	20 79 31 40	R	S-2: Very dense, tan, fine SAND, some Silt, trace Organic Fibers.				TOPSOIL/SUBSOIL	
											4'		175.5'
5		S-3	4-6	24	24	21 35 31 37	66	S-3: Very dense, tan, fine to medium SAND and SILT & CLAY, trace Gravel. (Rust-colored soil mottling observed)					
		S-4	6-8	24	17	29 42 39 34	81	S-4: Very dense, light brown, fine SAND and SILT & CLAY, trace Gravel. (Rust-colored soil mottling observed)				INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
		S-5	8-10	24	14	36 40 20 16	60	S-5: Very dense, grey/brown, GRAVEL, some fine to coarse Sand, little Clayey Silt. (Rust-colored soil mottling observed)	2				
10											10'		169.5'
								Bottom of boring at 10 feet.					
15													
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Boring terminated at approximately 10 feet below ground surface. Upon completion, borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-11

TEST BORING LOG

GZA GeoEnvironmental, Inc. *Engineers and Scientists*	**TEC, Inc.** **North Andover Proposed Kindergarten** **115 Phillips Brook Road** **North Andover, Massachusetts**	**BORING NO.:** GZ-12 **SHEET:** 1 of 1 **PROJECT NO:** 18.0173456.00 **REVIEWED BY:** JAK

Drilling Co.: New England Boring	**Type of Rig:** ATV	**Boring Location:** See Plan	**H. Datum:** -
Foreman: Matt Stone	**Rig Model:** Diedrich D-90	**Ground Surface Elev. (ft.):** 181.5	
Logged By: Dan Sanfilippo	**Drilling Method:** HSA	**Final Boring Depth (ft.):** 7	
		Date Start - Finish: 10/20/2017 - 10/20/2017	**V. Datum:** NAVD88

Auger/Casing Type: HSA	**Sampler Type:** Split Spoon	**Groundwater Depth (ft.)**	
I.D/O.D.(in): 2.75/6.125	**I.D./O.D. (in.):** 1.375/2		
Hammer Weight (lb.): -	**Sampler Hmr Wt (lb):** 140		
Hammer Fall (in.): -	**Sampler Hmr Fall (in):** 30		
Other: -	**Other:** Safety Hammer		

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
									1		0.5'	ASPHALT	181.0'
									2		1'	FILL	180.5'
		S-1	1-3	24	13	11 22 32 23	54	S-1: Very dense, brown, fine to coarse SAND and GRAVEL, some Silt.					
		S-2	3-5	24	18	22 24 14 14	38	S-2: Dense, tan, fine to medium SAND and GRAVEL, some Silt & Clay.				INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
5		S-3	5-7	24	14	14 20 20 24	40	S-3: Dense, grey/brown, fine to medium SAND and GRAVEL, some Clayey Silt.					
									3		7'		174.5'
								Bottom of boring at 7 feet.					
10													
15													
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Advanced HSA from ground surface to approximately 6 inches below ground surface (bgs) through Ashpalt pavement prior to obtaining sample S-1.
3. Boring terminated at approximately 7 feet below ground surface. Upon completion, borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-12

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

TEC, Inc.
North Andover Proposed Kindergarten
115 Phillips Brook Road
North Andover, Massachusetts

BORING NO.: GZ-13
SHEET: 1 of 1
PROJECT NO: 18.0173456.00
REVIEWED BY: JAK

Drilling Co.: New England Boring	**Type of Rig:** ATV	**Boring Location:** See Plan	**H. Datum:** -
Foreman: Matt Stone	**Rig Model:** Diedrich D-90	**Ground Surface Elev. (ft.):** 169.5	
Logged By: Dan Sanfilippo	**Drilling Method:** HSA	**Final Boring Depth (ft.):** 7	
		Date Start - Finish: 10/20/2017 - 10/20/2017	**V. Datum:** NAVD88

Auger/Casing Type: HSA	**Sampler Type:** Split Spoon	
I.D/O.D.(in): 2.75/6.125	**I.D./O.D. (in.):** 1.375/2	
Hammer Weight (lb.): -	**Sampler Hmr Wt (lb):** 140	
Hammer Fall (in.): -	**Sampler Hmr Fall (in):** 30	
Other: -	**Other:** Safety Hammer	

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
Not	Measured.			

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
									1		0.5'	ASPHALT	169.0'
									2		1'	FILL	168.5'
		S-1	1-3	24	0	15 15 13 15	28	S-1: No recovery.					
		S-2	3-5	24	4	24 27 26 30	53	S-2: Very dense, dark brown, fine to medium SAND, some Silt & Clay, little Gravel.				INTERBEDDED SILT, CLAY, SAND, AND GRAVEL	
5		S-3	5-7	24	4	57 50 49 54	99	S-3: Very dense, dark brown, fine to coarse SAND and GRAVEL, little Clayey Silt.					
									3		7'		162.5'
								Bottom of boring at 7 feet.					
10													
15													
20													
25													
30													

REMARKS

1. Ground surface elevation estimated from draft grading and drainage site plan entitled "Proposed Kindergarten, Concept D, North Andover, MA," prepared by TEC, Inc. and provided to GZA via email on October 17, 2017.
2. Advanced HSA from ground surface to approximately 6 inches below ground surface (bgs) through Ashpalt pavement prior to obtaining sample S-1.
3. Boring terminated at approximately 7 feet below ground surface. Upon completion, borehole backfilled with drill cuttings.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Boring No.: GZ-13

Appendix C - Geotechnical Laboratory Test Results

THIELSCH ENGINEERING

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
http://www.thielsch.com

Client Information:
GZA Environmental
Norwood, MA
PM: Mike Smith
Assigned By: M. Smith
Collected By: D. Sanfilippo

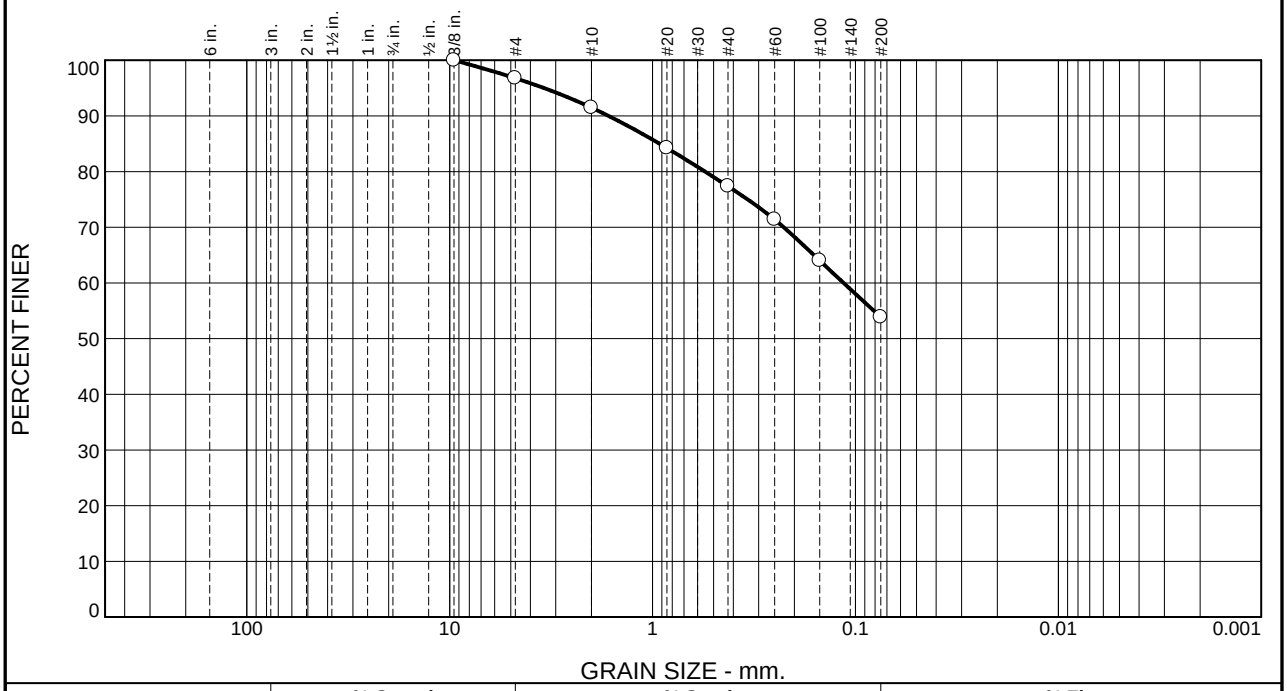
Laboratory Information
Project Name:
Proposed Kindergarten
115 Phillips Brook Rd, North Andover, MA
Client Project Number: 18.0173456.00
Report Date: 10.26.17

LABORATORY TESTING DATA SHEET

Boring ID	Sample No.	Depth (ft)	Laboratory No.	Identification Tests							Density		Strength Tests				
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) Corrected	CBR Setup as % of Proctor	CBR Dry unit wt. pcf	CBR Water Content %	CBR @ 0.1" @ 0.2"	Laboratory Log and Soil Description
GZ-3	S-4	10-12	1				3.2	42.9	53.9								Brown SILT and f-c SAND, trace fine Gravel
GZ-8	S-3	4-6	2				3.0	49.0	48.0								Brown f-m SAND and SILT, trace fine Gravel
GZ-12	S-1	1-3	3				38.5	39.4	22.1								Brown f-c SAND and f-c GRAVEL, some Silt

Reviewed By _____ Date Reviewed: *10.26.17*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.2	5.3	14.1	23.5	53.9	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	96.8		
#10	91.5		
#20	84.2		
#40	77.4		
#60	71.4		
#100	64.0		
#200	53.9		

* (no specification provided)

Material Description

Brown SILT and f-c SAND, trace fine Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 1.6465 D_{85}= 0.9237 D_{60}= 0.1144
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 10.25.17 **Date Tested:** 10.26.17

Tested By: JF

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings **Depth:** 10-12' **Date Sampled:**

Sample Number: GZ-3 / S-4

Thielsch Engineering Inc.

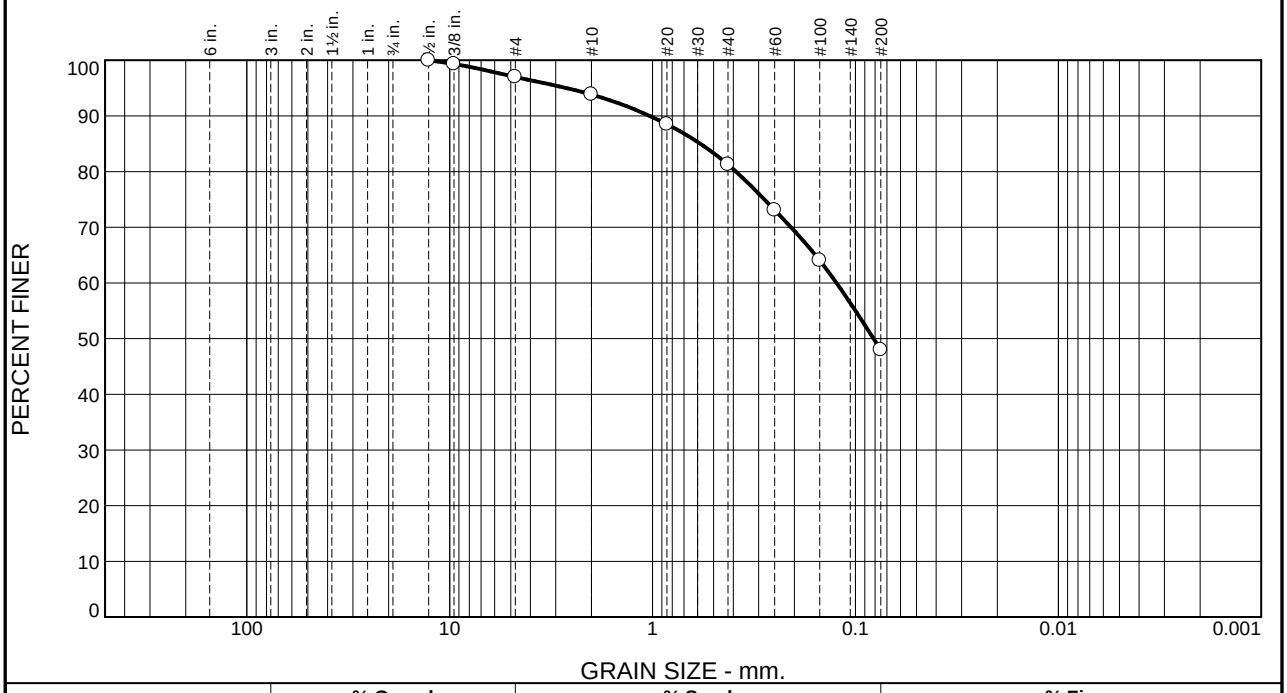
Cranston, RI

Client: GZA GeoEnvironmental

Project: Proposed Kindergarten
North Andover, MA

Project No: 18.0173456.00 **Figure** S-1

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	3.2	12.5	33.3	48.0	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.5"	100.0		
0.375"	99.3		
#4	97.0		
#10	93.8		
#20	88.5		
#40	81.3		
#60	73.1		
#100	64.0		
#200	48.0		

* (no specification provided)

Material Description

Brown f-m SAND and SILT, trace fine Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 1.0335 D_{85}= 0.5811 D_{60}= 0.1240
D_{50}= 0.0815 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 10.25.17 **Date Tested:** 10.26.17

Tested By: JF

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings **Depth:** 4-6' **Date Sampled:**

Sample Number: GZ-8 / S-3

Thielsch Engineering Inc.

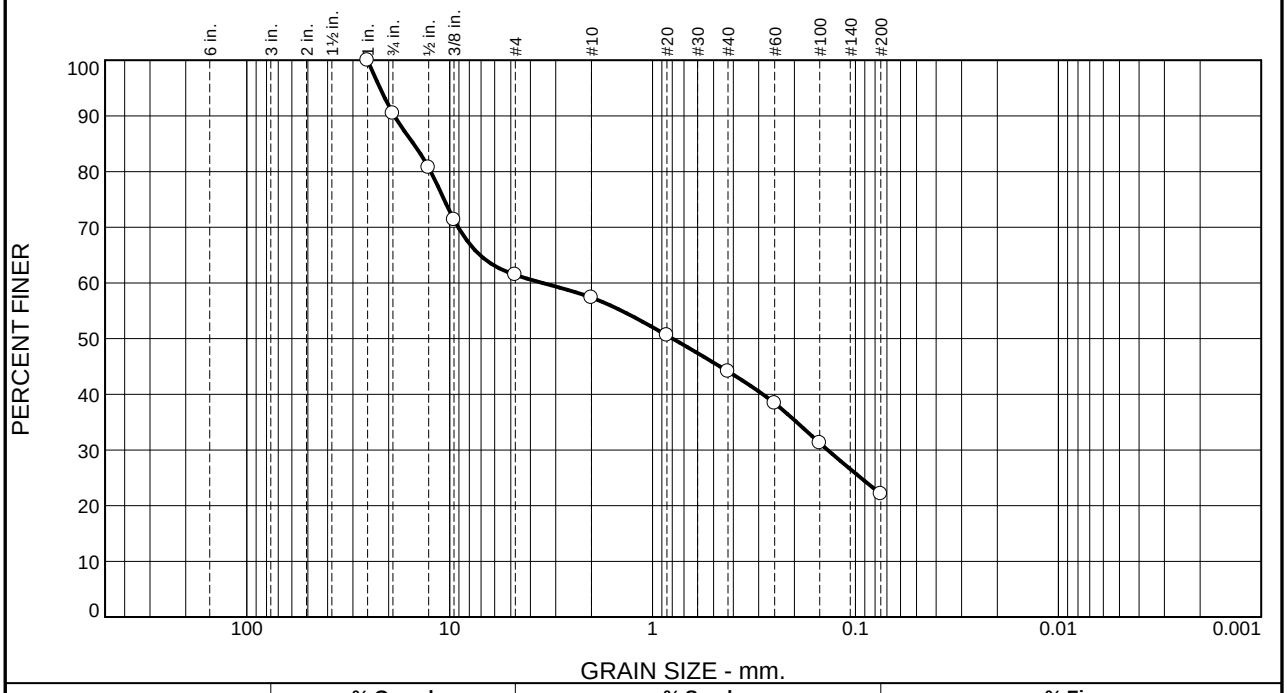
Cranston, RI

Client: GZA GeoEnvironmental

Project: Proposed Kindergarten
North Andover, MA

Project No: 18.0173456.00 **Figure** S-2

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.5	29.0	4.1	13.3	22.0	22.1	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	90.5		
0.5"	80.7		
0.375"	71.3		
#4	61.5		
#10	57.4		
#20	50.6		
#40	44.1		
#60	38.4		
#100	31.3		
#200	22.1		

* (no specification provided)

Material Description

Brown f-c SAND and f-c GRAVEL, some Silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 18.7239 D_{85}= 15.0699 D_{60}= 3.4884
D_{50}= 0.7965 D_{30}= 0.1371 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 10.25.17 **Date Tested:** 10.26.17

Tested By: JF

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings **Depth:** 1-3' **Date Sampled:**
Sample Number: GZ-12 / S-1

Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Proposed Kindergarten
North Andover, MA
Project No: 18.0173456.00 **Figure** S-3

PERFORMANCE SPECIFICATIONS
OVERVIEW

DIVISION 1 - GENERAL

SECTION 01 11 00 - SUMMARY OF WORK

General Intent: The general intent of the scope of work for the modular classroom is shown on these drawings for design intent, function and performance. Each contractor submitting a proposal shall describe in detail how their system shall meet the design intent in the most efficient and cost effective manner.

The Contractor shall design, engineer, fabricate, furnish, transport, deliver, assemble, install, and erect, new modular buildings and associated site preparation at 115 Phillips Brook Road, North Andover, MA, as stipulated in the RFP Documents and as specified herein below.

Structural System: The Structural system shall be designed/ engineered to meet Massachusetts State Code requirements.

Program Parameters:

Program spaces shall be as indicated on Drawings. Classroom provided in the modular construction shall be sized as large as the dimensions indicate.

Interior Partitions shall have sound transmission rating no less than STC-47.

Minimum ceiling height for interior space shall be no less than 8’-0” in the corridors and 8’-6” in the classrooms, 14’-0” in the cafeteria and 9’-0” in the kitchen.

Construction must meet all applicable state and local codes included but not limited to Massachusetts State Building Code, MAAB & ADA.

During the course of work of this Contract, a separate Contractor (under a separate Contract with the Owner) shall be engaged to perform renovation work on the interior of the existing ECC Building. Likewise, the Town of North Andover shall be under contract to perform the site work package that will include earthwork, paving, curbs, walkways, retaining walls and running buried utilities to the points where this contractor is to connect to water, sprinkler, gas and electricity. These Separate Contractors shall commence work and complete work as per the schedule that is provided in this RFP.

SECTION 01 30 00 - REGULATORY REQUIREMENTS

All construction and installation shall meet or exceed the Public Safety certification requirements for modular construction and Massachusetts Building Codes and Fire Safety Codes, including but not limited to: ADA, MAAB regulations, and NFPA 101 - Life Safety Code, National Electrical Code (as adopted by the Massachusetts), ASHRAE Standard 90.1 (Energy Code). Should changes be implemented by regulatory agencies having jurisdiction after proposal opening but before

building permit is issued, the Contractor may adjust its proposal and construction schedule accordingly.

Modular construction shall be in compliance with Massachusetts State Building Code 780CMR, current edition and modular units shall be certified by the Massachusetts Department of Public Safety.

Use and Occupancy Classification: Educational Group E.

Construction Classification: Type II-B.

Type II construction is that type of construction in which the structural elements, exterior walls and interior walls are of any materials permitted by 780CMR.

Fire Resistance Rating requirements for Type IIB Building Elements:

Structural frame, including columns, girders, trusses: 0 hour.
Bearing walls, exterior and interior: 0 hour.
Nonbearing walls and partitions (Exterior): see Table 602.
Nonbearing walls and partitions (Interior): 0 hour.
Floor construction, including supporting beams and joists: 0 hour.
Roof construction, including supporting beams and joists: 0 hour.

Design loads for the modular construction shall be in every aspect meet or exceed the Massachusetts Building Code and public safety inspection/certification requirements. Local conditions may vary in terms of wind and seismic loads requirements.

	Live Load	Dead Load
Floor	50 psf	15 psf
Roof	55 psf	15 psf
Corridor	100 psf	15 psf

SECTION 01 31 13 - CONSTRUCTION MANAGEMENT

The Contractor shall furnish a full time site superintendent who shall remain on site for the duration of any on-site construction until the modular buildings have been accepted by the Awarding Authority. The contractor shall again furnish full time superintendence once the lease term has expired (occupancy of modulars has concluded) for the dismantling and removal of the modular buildings from the site and until the site has been restored to it original conditions. The Contractor shall also designate a Project Manager who shall manage and be responsible for all phases of work, from design/engineering through final removal and site restoration. The Awarding Authority may, at its discretion, designate a single point of contact, Owner's Project Manager (OPM), to channel all information for this project to Contractor's Project Manager.

SECTION 01 41 26 - PERMITS AND INSPECTIONS

The Contractor shall acquire Public Safety Department certification for each modular unit and shall obtain Building Permit for modular construction, including coordinating, scheduling and performing all inspections. All costs associated with Building Permit, inspections and certifications shall be the responsibility of the Contractor.

The Contractor shall prepare and submit design plans and specifications, signed and sealed, by a licensed professional engineer registered in Massachusetts, and apply for Building Permit prior to commencing of any on-site work. The on-site construction scheduled for this Project shall not commence until Contractor has obtained all necessary approvals and permits from all governing local, state and/or federal agencies having jurisdiction.

Obtain all permits required for the transportation of modular units from the factory to and from the construction site.

Obtain all use and occupancy permits.

SECTION 01 42 19 - REFERENCE STANDARDS

Modular building construction shall conform and comply fully with applicable codes, standards and regulations, including but not limited to:

1. American Society for Testing and Materials (ASTM);
2. Underwriter's Laboratories (UL);
3. Insulated Power Cable Engineer's Association (IPCEA);
4. National Electric Manufacturer's Association (NEMA);
5. Institute of Electrical and Electronic Engineers (IEEE);
6. American National Standards Institute (ANSI);
7. National Fire Protection Association (NFPA);
8. Occupational Safety and Health Act (OSHA);
9. American Society of Heating, Refrigeration, and Air Conditioning (ASHRAE);
10. Sheet Metal, Air Conditioning National Association (SMACNA);
11. Massachusetts State Public Safety Inspection and certification requirements;
12. Massachusetts State Building Code, current edition (MSBC);
13. Massachusetts Electrical Code (MEC);
14. ADA and Massachusetts Architectural Access Board (MAAB) regulations.
15. Local Building Department, Electrical, Fire Alarm and Plumbing Inspectors and any other authority having jurisdiction;
16. Local Fire Department;
17. Massachusetts Department of Environmental Protection (DEP)
18. Rules and Regulations for Construction Operations by Department of Labor and Industries, Commonwealth of Massachusetts;
19. Other government authorities having jurisdiction.

SECTION 01 51 00 - TEMPORARY UTILITIES AND SERVICES (Prior to occupancy)

The Awarding Authority will make temporary water and electric services available from designated service points in the existing building during the construction/erection period (prior to occupancy) at no charge to the Contractor, provided such use by the Contractor is not careless or wasteful. Contractor shall furnish, install, and maintain all necessary temporary utility service connections for his own use. All such temporary connections must be installed in accordance with applicable codes and regulations.

Temporary Utilities for Period of occupancy are described further below.

Contractor shall provide dumpsters for collecting debris. Dumpsters shall be emptied promptly when required.

The contractor shall provide portable toilets for Contractor and subcontractor's use. Use of school toilet shall be strictly prohibited.

Provide temporary lighting for construction where required. Provide night lighting and lighting for safety and security where required by authorities having jurisdiction.

Contractor shall provide on site superintendent with Massachusetts license to manage the site work at all time during working hours. Superintendent shall be responsible for weekly site meetings and daily logs of on-site activities. All subcontractors shall report to the superintendent. On-site Superintendent shall have a wireless Smart phone with e-mail function for communication with Awarding Authority and the Architect.

SECTION 01 50 00 - TEMPORARY CONTROL

The Contractor shall furnish and install temporary fencing and barricades with warning signs at Project site around the entire work and staging area, and as required to protect its work and to maintain job site safety and security during construction and removal. Remove fencing and barricades prior to building occupancy.

Fence shall be at least 4"-0" in height.

Erosion control during construction, where necessary and as directed by authorities having jurisdiction.

SECTION 01 45 00 - ENGINEERING SERVICES - QUALITY CONTROL

The Contractor shall provide design and construction documents (plans and specifications, etc.) required for the safety certification, permit applications and for the construction of the entire modular building project including but not limited to site, civil, architectural, structural, mechanical, and electrical. All such design and construction documents provided shall be prepared, signed and sealed by engineers registered in Massachusetts. The drawings and specification

provided in this RFP are to show general design intent only in regard to sizes of program spaces, general configuration and relationship of modular units to the existing building.

The Awarding Authority have included site drawings indicating the existing topographic information, known utility locations, location of the modular buildings prior to the Contractor commencing any site work. Site Contractor shall verify all existing conditions prior to fabrication and construction.

DIVISION 2 - EXISTING CONDITIONS

SECTION 02 22 00 - SUBSURFACE INVESTIGATION

The Contractor is responsible for "Dig Safe" notification and to locate all site obstructions above and below ground, as required.

DIVISION 3 - CONCRETE

See Section 03 30 00 – Cast-in-Place Concrete

DIVISION 5 - METALS

SECTION 05 10 00 - STRUCTURAL METAL FRAMING

Concrete shall provide tie down anchors in foundations at all locations for proper anchoring of modular unit's structures.

Galvanized metal shims where required.

Steel Frame: Perimeter design I beam and cross members as required meeting or exceeding design loads.

Lateral Bracing: This contractor is responsible for any lateral bracing required to support the modular units or bracing of structural frame supporting modulars.

Columns: steel corner posts as required for roof structural support.

Anchoring: Steel plates shall be located at intervals along the perimeter piers for welding the frame to the foundation system as directed by Contractor's structural engineer.

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07 20 00 - THERMAL PROTECTION

Floor: Min. R-19.
Exterior Wall: Min. R-13+R-3.8ci if metal framed.
Interior Wall: Min. R-11 and STC-47.
Roof: Min. R-38.

SECTION 07 50 00 - MEMBRANE ROOFING

Roofing: Fully adhered white EPDM membrane 60 mil roofing system with aluminum roof edge at perimeter; or equal.

Provide seam tapes, flashing, sheathing, batten, strips, and other pertinent accessories at transition between modular units and at any roof penetrations.

Roofing shall have positive drainage pitch and shall be free of standing water within any 48 hour period.

SECTION 07 70 00 - PREFABRICATED ROOF SPECIALTIES

Roof drainage: If provided, aluminum gutters and downspouts installed at building perimeter as required for proper drainage. Downspouts are to discharge onto grade level.

SECTION 07 80 00 - FIRE AND SMOKE PROTECTION

Firestopping: Code-approved fire caulking and/or fire proofing methods to be installed at voids, penetrations, cut-outs, etc. at rated assemblies.

DIVISION 8 - DOORS AND WINDOWS

SECTION 08 11 00 - METAL DOORS AND FRAMES

Exterior Doors: 3’-0” x 6’-8” insulated, min. 18 gauge hollow metal door with 24” x 36” safety glass vision panel. Injection molded metal or plastic doors are acceptable. Provide fire-rated door where required.

Door Frames: 16 gauge knock-down hollow metal frame. Fire-rated where required.

Finish: Frames shall be paint finished, doors shall be clear finished.

SECTION 08 14 00 - WOOD DOORS

Interior Classroom and Office Doors shall be manufacturer’s standard 3’-0” x 6’-8” multi-ply solid core wood doors with 3” x 33” safety glass vision panel. Injection molded metal or plastic doors are acceptable. Hollow core wood doors are not acceptable. Provide fire-rated door where required.

Closet Door: Solid wood door in wood frame, sizes as indicated.

Finish: Frames shall be paint finished, doors shall be clear.

SECTION 08 50 00 - WINDOWS

Each classroom shall have two windows, each not less than 8 sf. Where an office has an exterior wall, it shall have at least one window, not less than 8 sf.

Exterior windows shall be operable and opening in the same plane (double-hung or sliding). Projecting windows (casement, awning, hopper, etc.) shall not be permitted.

Exterior windows and frames may be fiberglass with thermal break.

Window glass shall be insulating glass with low-E coating.

Provide manufacturer's standard insect screen.

Color: white or manufacturer's standard color. All windows in each wing shall have the same color.

SECTION 08 70 00 - FINISH HARDWARE

All finish hardware shall be at least Grade 2 designated for medium duty applications.

Exterior doors: Commercial grade panic hardware with ADA-compliant lever set, hydraulic closer, 1-1/2. pairs of ball bearing hinges, aluminum threshold, weather stripping and bottom sweep.

Interior, doors: Commercial grade ADA-compliant lever set, hydraulic closer, 1-1/2 pairs of ball bearing hinges and wall mounted door stop.

Door keying: master-keyed to be compatible with existing keying system and as directed by the Awarding Authority. Provide schedule for lockset function for approval by Owner prior to installation.

Coat Hooks: provide 30 coat hooks per each full size classroom at entry walls, typ. Hook heights shall be 36" AFF, UON.

Hardware for Main Entrance shall include electrified hardware to tie into video entry system (Aiphone) System which will include an outdoor station where a visitor will depress a button at an external call station. That buzzer will ring at a monitoring station located in the office. When activated, the device in the administration area can automatically retract the latch in the active leaf at the door and make the door a push/ pull function to allow entry. Wiring (and hardware including power supply) between these locations shall be done by the modular contractor. Devices and terminations shall be completed by the Awarding Authority.

DIVISION 9 - FINISHES

SECTION 09 50 00 - SUSPENDED CEILING SYSTEM

Suspended ceiling: Suspended ceiling system shall be provided throughout, with 2’ x 2’ non directional lay-in ceiling tile set in metal grid. Color: white on white.

NRC rating: 0.70
Light Reflectance: 0.85
UL: Class A

Minimum ceiling height: 8’-0".

SECTION 09 29 00 - GYPSUM WALLBOARD

Interior Wall Finish: Wall finish shall be min. 1/2" thick gypsum wallboard; or equal, with painted finish. Impact resistant GWB required in gymnasium.

SECTION 09 65 00 - FLOORING

Floor Covering: All modular spaces (except Lobby) shall be provided with 1/8” x 12” x 12” vinyl composition tile throughout the interior spaces. Tile shall be sealed and waxed before Awarding Authority accepts the modular buildings. Minimum 2 coats of wax prior to furniture move-in.

- Lobby and Gymnasium, provide 3’-0” x 3’-0” x 1/8” rubber tile
- Toilet Rooms, provide 6” x 6” x 5/16” ceramic tile
- Kitchen, Receiving and Janitor, provide seamless resin epoxy floor and base

a. Provide (2)walk off entry matts, 10’ in length.

Base trim: 4” vinyl cove base.

DIVISION 10 - SPECIALTIES

SECTION 10 11 00 - VISUAL DISPLAY BOARDS/TACK BOARD

Marker Board: provide at each classroom and elsewhere as shown. Marker board shall be dry erase porcelain coated steel white board with tray and aluminum frame. Installed at locations as indicated. Bottom of board shall be 30" for kindergarten classrooms.

SECTION 10 14 00 - IDENTIFYING DEVICES SIGNAGE:

Signage: Provide one each ADA-compliant identification signage at all interior and exterior doors with Room Name and Room Number as directed by the Awarding Authority.

SECTION 10 28 00 TOILET ACCESSORIES

Coat Hook: Provide one at each toilet stall door.

Grab Bars: Provide two 42" long at each accessible toilet stall.

Framed Mirror: Provide one 12"x24" at each sink.

Soap Dispenser: Provide one at each toilet room lavatory.

Sanitary Napkin Disposal: Provide one at each toilet stall at adult toilet room.

Toilet Tissue Dispenser: Provide one multi-roll type at each toilet stall.

Towel Dispenser & Waste Receptacle: Provide one wall-recessed unit at each toilet room. (shall be compatible with paper supplies for existing Stratton School).

Mop and Broom Holder: Provide one at each Janitor's Closet above mop sink.

Note: provide MAAB and ADA-complaint toilet accessories mounted at accessible heights at all required accessible locations.

SECTION 10 44 00 - FIRE PROTECTION SPECIALTIES

Fire Extinguisher: 10 lb. ABC rated with wall-mounted bracket, inspected and certified.

Provide adequate number of fire extinguisher and at locations as required by NFPA 10-2007, no less than two per each corridor and connector. Recessed type is acceptable at Contractor's option.

Identify bracket-mounted extinguishers with red-letter decals spelling "FIRE EXTINGUISHER" applied to wall surface.

DIVISION 11 - EQUIPMENT

[Not Used]

DIVISION 12 - FURNISHINGS

SECTION 12 24 00 - WINDOW SHADES

Venetian Blinds: Rolling sunshade blinds installed at each exterior window.

SECTION 12 30 00 - MANUFACTURED CASEWORK

Wardrobe: built-in 1/16" plastic laminated (wood grain) plywood wardrobe where as indicated on drawings.

Storage Shelving: Provide 1/16" plastic laminated (wood grain) plywood storage shelving and mounting brackets where as indicated on drawings.

DIVISION - 21 FIRE PROTECTION

SECTION 21 00 00 - SPRINKLER SYSTEM

Provide complete standalone sprinkler coverage for modular building structure including connection to city main. Refer to Division 33 below. Interconnect the sprinkler system to the new fire service main. Sprinkler systems for the modular construction shall be complete with all required valves, backflow preventors, fire department connections, alarm bells, fire alarm supervisory interface, heads, piping, hangers, etc. All work to be provided in accordance with Massachusetts Fire Safety Code and NFPA-13, and applicable requirements of the local water authority.

DIVISION 22 - PLUMBING

SECTION 22 00 00 - PLUMBING

Provide complete standalone plumbing system for the modular construction with dedicated line from the main in street (refer to Division 33 below)

Provide cleanout at head end of sanitary piping for modular maintenance.

Plumbing Fixture: For each modular building structure provide toilets, lavatories, urinals, drinking fountains, hand-wash sink, mop sinks, and other plumbing fixture at locations throughout the modular buildings as indicated on Drawings or as required by code. Where applicable, plumbing fixtures so provided shall be ADA/MAAB compliant in terms of the location, dimension, type, number, and mounting requirements of fixture.

Water Heater: provide one 80-gallon electric water heater, and 10-gallon electric water heater at remote sinks where necessary.

Provide hot and cold water at all sink/lavatory locations.

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

SECTION 23 00 00- HEATING, VENTILATING AND AIR CONDITIONING

General: Provide a complete system to heat, cool, and ventilate all areas within the modular building and pre-engineered metal building structures. Ventilation rates shall meet the minimum standards required under the Building Code and ASHRAE Standard 62. Outdoor air rates shall not be less than 15 CFM per occupant.

Typical Modular Units: Roof mounted electric/electric ac/heater units with economizers and relief fan.

Equipment provided shall be properly sized to meet heating, cooling, and ventilation load for each space served. Equipment efficiencies shall meet or exceed that specified by the Massachusetts Building Code 8th edition which references ASHRAE 90.1 – 2007 and International Energy Conservation Code 2015.

Metal Building Units shall be suspended units in ceiling plenum.

Ductwork: Supply and return ducts shall be metal ductwork shall be galvanized and meeting the minimum standards of SMANCA in construction. Insulation on duct systems shall meet the minimum performance requirements of Massachusetts Building Code 8th, International Mechanical Code 2009 and International Energy Conservation Code 2015 state and local building codes. Return systems shall be fully ducted.

Diffusers: Supply - 24" x 24" lay-in type with volume adjustable dampers. Return – egg crate.

Fire Dampers: where applicable, located at all ductwork penetrations through rated construction.

Thermostat: Provide programmable thermostat for each space/zone served. Manual changeover heating and cooling.

Exhaust fan: Provide exhaust systems for each toilet room with a minimum exhaust rate of 75 CFM per water closet installed. Provide exhaust systems for all janitor and mechanical support space to sufficiently exhaust contaminants from these spaces and meeting applicable codes and standards.

HVAC Controls: It is the intent of the Owner to monitor and control the HVAC equipment for both the new addition as well as the existing ECC. As part of this contract, the contractor shall provide communication cards at all NEW HVAC equipment both at the modular classrooms and metal building, to allow the Owner this future central monitoring capability.

DIVISION 26 - ELECTRICAL

SECTION 26 05 00 - CONDUCTORS

Power: General Wiring: Provide type MC wiring throughout.

For any underground wiring provide type THHN/THWN or XHHW in schedule 40 PVC conduit, with all bends sweeps and penetrations in rigid galvanized conduit.

SECTION 26 05 33 - RECEPTACLES

Receptacles: Interior. Duplex outlets shall be provided as shown on the Drawings, type: 20 amp. Provide GFl type receptacles in areas where required by code. Provide power and outlets to serve

all equipment shown on the plans. Provide power at all data drops shown on the plans. In general, power outlets in classrooms should be located at 4 locations in addition to the needed outlets for IT.

The Contractor will be responsible for installing duplex and double duplex TVSS electrical receptacles as required for all technology outlets shown on the drawings, including 4-inch square back boxes with single gang or 2-gang plaster rings as required, floor boxes, EMT conduits, EMT sleeves, and bushings.

At data drop locations, this contractor shall be responsible for installing ¾" diameter empty conduits that terminates above the ceiling and install a back box.

The Contractor shall be responsible for installing plywood backboards, cable ladder system. NEMA 5 twist lock receptacles, wall electrical receptacles, 4-inch sleeves, 3-inch conduits, pull lines, and bushings as shown on the drawings for use by the owner.

Maximum number of standard 20Amp duplex receptacles on a single branch circuit shall be 6.

Exterior: Weatherproof GFl in crawl space for heat tracing as determined by Modular Contractor's Electrical engineer.

Exterior: Weatherproof GFl installed on each roof mounted roof air conditioner / heater.

SECTION 26 11 00 - DISTRIBUTION EQUIPMENT

Main distribution panel: 120/208, 3 phase, 4 wire, main distribution panel, sized accordingly. Provide service entrance rated disconnect (Maximum size shall be 600amps) and utility metering provisions which are compatible with local utility company requirements.

Subpanels: 100 amp, 120/208, 3 phase, 4 wire minimum as required for loads served.

Provide adequate number of multiple distribution panel boards where necessary but no less than one for each wing.

SECTION 26 50 00 - LIGHTING

Interior Classrooms: 2' x 4' ceiling recessed LED fixtures and standard acrylic lenses.

Interior Gymnasium: 2' x 4' ceiling recessed LED fixtures with impact resistant acrylic lenses with retaining clips.

Provide Occupancy Sensors with 'manual on' low voltages switches to meet 2012 IECC.

Lighting levels shall be provided to the following minimum standards or as recommended by IESNA, whichever is greater in foot candles (FC)
Classrooms: 30 FC
Offices: 30 FC

Corridors: 10 FC
Storage, Support, Mechanical, Toilet, and all other spaces: 30FC

SECTION 26 52 00 - EMERGENCY LIGHTING AND POWER

Emergency: Twin bulb emergency lights with battery backup located according to code.

Exit lights: Exit light with battery backup located according to code.

Remote Emergency Light Heads: 6 watt exterior wall mounted with battery backup installed at each egress door.

SECTION 26 56 00 - EXTERIOR LIGHTING

Exterior: Provide minimum 50 watt LED wall packs on exterior walls controlled by integral photo sensors. Lighting levels shall be 0.6 FC minimum around modular units.

DIVISION 27 – PHONES, COMMUNICATIONS, CLOCK AND PA SYSTEM

SECTION 27 00 00 – PHONE COMMUNICATION SYSTEMS

The phone and communication system wiring shall be done under a separate contract for this project. This includes extending the existing system from its present locations in the ECC to the new Administration location.

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

The access control system and the security alarm and detection systems shall be done under a separate contract from this project.

SECTION 28 31 00 – FIRE ALARM AND DETECTION SYSTEMS

General: Provide a complete fire alarm system within each building structure. Each structure shall be provided with a UL listed fire alarm panel which will interconnect with any applicable existing fire alarm system on site to report alarm conditions. The local fire alarm panel shall provide initiation and alarm signaling functions and be provided with battery back-up for 60 minutes of operation per NFPA-72. All work shall be performed in accordance with all applicable Massachusetts Building and Fire Codes and NFPA regulations. System wiring shall be brought to the exterior of the existing building by this Contractor as indicated in drawings. This contractor shall be responsible to provide a new FACP located at the new entrance vestibule. This contractor shall extend all existing wiring to the new location. Interconnection to existing fire alarm system for transmission of alarms back to the existing building or to central station will be provided by the Owner.

Minimum System Requirements:

1. Manual pull stations at all exits.

2. Supervision of all sprinkler systems for flow and supervisory alarm conditions.
3. Audio and Visual alarm signaling throughout entire building including A/V device in each classroom and on exterior of building. Signaling devices shall meet ADA and NFPA-72 requirements.
4. Visual alarms in Toilet Rooms and offices.

Fire alarm systems: Provide a complete standalone fire alarm system for each of the sites. Interconnect the modular fire alarm system to the existing school building fire alarm system. Provide complete automatic detection throughout modular construction. Provide smoke detectors in all spaces, such as classrooms, offices, storage, corridors and connectors. Provide heat detectors in mechanical and custodial spaces.

Provide smoke detectors in corridors.

DIVISION 31 - EARTHWORK

SECTION 31 05 00 - SITE DEMOLITION AND RELOCATION

The Contractor shall coordinate concrete foundations with existing underground utilities and coordinate the installation of the modular buildings with any overhead obstructions, i.e. utilities.

Site clearing and demolition as required for modular construction.

Saw cut asphalt/concrete for utility connections to existing field sources.

Remove construction debris off site and dispose of legally.

SECTION 31 09 00 - EARTHWORK

See section 31 20 00 – Earthwork

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 90 00 - SEEDING & LANDSCAPING

Seeding: Shall be performed where grading was required to install the new addition around the entire perimeter of the footprint.

Landscaping: Planting beds are to be installed where indicated on the plans around the footprint of the addition.

DIVISION 33 - UTILITIES

SECTION 33 01 00 - SERVICE UTILITIES

The Contractor will be responsible to confirm that all new utility sources (domestic water, fire water, sanitary) are adequate to support the loads and demands put on them by the installation of the modular buildings.

SECTION 33 11 00 - WATER SERVICE

Water service: Modular Contractor shall provide a complete temporary domestic water service from the main in the street complete to the modular wings and to each specific fixture, as necessary for complete installation and proper operation of water service., Coordinate work on-site and in street with the Owner and with the Town of North Andover. Obtain required permits and approvals and pay all associated fees and permit costs as necessary to complete this work. Final connection and utility metering provisions of water supply for each service connection shall be by this Contractor.

SECTION 33 11 19 - SPRINKLER SERVICE

Sprinkler service: Modular Contractor shall provide a complete fire water service from the main as necessary for complete installation and proper operation of the sprinkler service. Coordinate work on-site with the Owner and with the Town of North Andover. Obtain required permits and approvals and pay all associated fees and permit costs as necessary to complete this work. Final service connection shall be by this Contractor.

The Contractor shall provide sprinklers throughout the modular building and metal building in accordance with the Massachusetts State Fire Safety Code, NFPA 101, and NFPA-13 as adopted by the State of Massachusetts. Contractor will be responsible for providing fire service entrance valves, backflow preventers, fire department connections, and interface with fire alarm system for a complete code compliant installation.

SECTION 33 30 00 - SANITARY SERVICE

Sanitary Service:
This contractor is responsible for all associated piping and earthwork associated with connecting the modular units to the sanitary main as indicated in the drawings. Coordinate work on-site and in street with the Owner and with the Town of North Andover. Obtain required permits and approvals and pay all associated fees and permit costs as necessary to complete this work. Final service connection shall be by this Contractor.

SECTION 33 40 00 - SURFACE & SUBSURFACE DRAINAGE

Subsurface: Not applicable.

Ground: Surface drainage run-off is provided on site by new grading.

Roof Drain: Building run-off will be provided by roof drains, and/or gutter and down spouts. The run-off shall then be piped from downspouts into new subsurface drain lines. This contractor shall run the lines to 10" outside the face of the footprint where they will be connected to lines installed under a separate site works package.

SECTION 33 71 00 - ELECTRIC SERVICE

Service: This Contractor shall be responsible for providing underground services to the addition. This addition will require a utility company pad mounted transformer. The Contractor shall be responsible for all costs associated to install a complete electric service throughout the modular buildings, including but not limited to, design, engineering, connection to the modular buildings' electric panels and sub-panels, utility metering provisions, service entrance rated main disconnect, disconnects and building grounding, etc.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Provide all labor, materials, equipment, services and accessories necessary to furnish and install the work of this Section, complete and functional, as indicated in the Contract Documents and as specified herein.

B. The work of this Section consists of all cast-in-place concrete work as shown on the Drawings and as specified herein, and includes, but is not limited to, the following:

1. Furnishing, placing, finishing, curing and protection of all plain and reinforced concrete work for the building. Also include all concrete work necessary to complete the work of other trades (i.e. housekeeping pads, inertia blocks, and foundations for mechanical, plumbing and electrical equipment).
2. Furnishing and placing of reinforcing steel and related accessories.
3. Furnishing, erection and removal of formwork and shoring, as required.
4. Furnishing and installation of control joints, joint fillers and joint sealants.
5. Concrete mix design, including admixtures.
6. Coordination with all other trades for location of all pipe sleeves, duct openings, keys, chases, electrical boxes and conduits, anchors, dowels, embed plates, inserts, fastenings, flashing reglets and other devices required by other trades.
7. Finishing of exposed concrete surfaces as herein specified.
8. Installation of items such as sleeves, embed plates, anchor bolts, keys, dowels, inserts, etc. furnished by other trades which are required to be cast into concrete.
9. Hardening and sealing of exposed concrete floors as herein specified.
10. Furnishing and installation of non-shrink grout at base plates, pockets, etc.
11. Furnishing and installation of patching compound at unacceptable honeycombing areas.
12. Preparation and submission of reinforcing steel shop drawings.
13. Furnishing and installation of vapor retarder under all slabs-on-grade.
14. Installation of rigid insulation at perimeter foundation walls and below slabs-on-grade as shown on Architectural Drawings.

1.2 RELATED WORK

A. The following items of related work are specified and included in other Sections of the Specifications:

1. Section 02 20 00 – Earthwork
2. Section 13 34 19 Metal Building Systems
3. Section 13 45 00 Modular Construction

1.3 REFERENCE SPECIFICATIONS

A Standards: The Contractor shall have in his possession and shall keep available in his field office, the following Standards and Recommended Practices to which reference may be made herein and to which the Contractor shall conform, except where otherwise required by this Specification.

1. American Society for Testing and Materials (ASTM): Listed Standards.
2. American Concrete Institute (ACI): Listed Standards.
3. ACI 211.1, "Recommended Practice for Selecting Proportions for Normal and Heavyweights."
4. ACI 211.1, "Recommended Practice for Selecting Proportions for Structural Lightweight Concrete."
5. ACI 214, "Recommended Practice for Evaluation of Compression Test Results of Field Concrete."
6. ACI 301, "Specifications for Structural Concrete for Buildings."
7. ACI 302, "Recommended Practice for Concrete Floor and Slab Construction."
8. ACI 304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete."
9. ACI 305, "Recommended Practice for Hot Weather Concreting."
10. ACI 306, "Recommended Practice for Cold Weather Concreting."
11. ACI 309, "Consolidation of Concrete."
12 ACI 311, "Recommended Practice for Concrete Inspection."
13. ACI 315, "Recommended Practice for Detailing Reinforced Concrete Structures."
14. ACI 318, "Building Code Requirements for Reinforced Concrete."
15. ACI 247, "Recommended Practice for Concrete Formwork."
16. CRSI, "Reinforced Concrete - A Manual of Standard Practice."
17. CRSI, "Recommended Practice for Placing Reinforcing Bars."
18. CRSI, "Recommended Practice for Placing Bar Supports."
19. AWS D1.4, "Structural Welding Code - Reinforcing Steel."

1.4 SUBMITTALS

A. Submit shop and erection drawings for reinforcing steel (electronic) and manufacturer's data for other products for Architect's approval.

B. Provide shop drawings for fabricating and placing reinforcing steel. Show all required information for cutting, bending and placing reinforcing bars, and show all accessories and support bars on placing drawings. Indicate suitable marks for placing bars.

C. Submit concrete mix design, for all strengths indicated on the Drawings, for Architect’s approval.

D. Fabrication of any material or performing of any work prior to the final approval of the shop drawings will be entirely at the risk of the Contractor.

E. The Contractor is responsible for furnishing and installing materials called for in Contract Documents, even though these materials may have been omitted from approved shop drawings.

F. Before being submitted to the Architect, all shop drawings shall be properly checked and coordinated by the Fabricator and by the Contractor and shall be stamped and signed accordingly. Drawings not complying with these requirements will be returned unchecked and stamped, "Not Approved."

G. At least one copy of each approved Shop Drawing shall be kept available in the Contractor's field office. Drawings not bearing evidence of release for construction by the Architect/Engineer shall not be kept on the job.

H. Substitutions: Any request for product substitutions must be submitted with all necessary documentation, for the Architect/Engineer's review and approval.

1.5 TESTING, CONTROL AND INSPECTION

A. The Contractor shall retain the services of a qualified independent testing agency, approved by the Architect, to test aggregate and to prepare a mix design for each strength of concrete specified; and shall submit such mix designs and test results to the Architect for approval. Mix designs may also be based on proven current designs accompanied by test results. The costs of all such preliminary services shall be borne by the Contractor. All other testing and inspection will be performed by the Owner's testing agency.

B. A qualified testing agency approved by the Architect for other testing and inspection will be selected by and be paid by the Owner. Structural Tests and Inspections shall be in accordance with Chapter 17 of the Massachusetts State Building Code. Testing shall include, but not limited to:

1. Concrete compression tests shall consist of four (4) cylinders for each test made, cured and tested by the laboratory during the progress of the job. Samples for strength tests of each class of concrete placed each day shall be taken not less than for each 150 cubic yards of concrete placed, nor less than once for each 5000 square feet of surface area for slabs and walls, but at least one set for each day of concrete placements.
2. Reinforcing steel shall be inspected by grade, condition and positioning prior to each concrete placement.
3. Slump test of concrete.
4. Air content in concrete mix.
5. Any non-conformance with these Specifications shall be brought to the attention of the Contractor for correction prior to concrete placement.

C. Cooperate fully with the testing agency's work in taking and storing samples. Provide storage facilities for concrete cylinders at the site. Facilities must protect cylinders from effects of low or high temperatures.

D. Accept as final results of tests made by the qualified professional testing organization engaged by the Owner.

E. Testing required because of changes requested by the Contractor in materials, sources of materials, or mix proportions; and extra testing of concrete or materials because of failure to meet the Specification requirements are to be paid for by the Contractor.

F. Advise the Testing Agency of intent to place concrete by notification at least 24 hours prior to time of placement.

G. All materials, measuring, mixing, transportation, placing and curing shall be subject to inspection by the Architect or by the Testing Agency. However, such inspection, wherever conducted, shall not relieve the Contractor of his responsibility to furnish materials and workmanship in accordance with Contract requirements, nor shall inspector's acceptance of material or workmanship prevent later rejection of same by the Owner or Architect if defects are discovered.

H. A pre-construction meeting shall be held at which representatives of the Owner, Architect, Testing Agency and the Contractor shall be present, prior to the commencement of concrete work. Discussions at the meeting will include concrete mix design, admixtures, reinforcing steel and concrete placement, and concrete consolidation, curing and protection.

I. The Architect or his designate will at all times have the right to delay or stop concrete operations when in his judgment quality of the construction will impair the strength, durability or appearance of the finished product. All costs arising from delays due to noncompliance shall be paid by the Contractor.

1.6 NOTIFICATION OF RELATED TRADES

A. Notify all other trades responsible for installing chases, inserts, sleeves, anchors, louvers, etc., when ready for such installation, and for final checking immediately before concrete is placed. Cooperate with such trades to obtain proper installation.

B. Leave openings in walls for pipes, ducts, etc., for mechanical and electrical work as shown on Drawings or as required by layout of mechanical systems. Layout and reinforcing of openings not specifically shown on the Structural Drawings shall be submitted to the Architect for review prior to execution.

PART 2 – MATERIALS

2.1 CONCRETE COMPONENTS

A. Portland Cement: ASTM C-150 Type I at all exposed concrete, Type I or II elsewhere. All cement of each type shall be from a single source. Visual variations in color will not be accepted at exposed concrete surfaces.

B. Natural Aggregates:

1. Fine Aggregates for Concrete: Shall be natural sand consisting of clean, hard, durable, uncoated particles, conforming to ASTM C33. Organic content shall be determined according to ASTM C40, and supernatant liquid above test sample shall show color no darker than reference standard color solution prepared at same time. Allow no frozen or partially frozen aggregate in the mix.
2. Coarse Aggregate for Concrete: For regular weight concrete use crushed stone or gravel from approved source conforming to ASTM C33. Coarse aggregate shall not contain greater amounts of deleterious materials than specified in Table III, ASTM C33.
3. Aggregate of designated size 1-1/2" may be used in work below finished grade provided the size of the coarse aggregate does not exceed 3/4 of the clear distance between reinforcing bars, nor 3/4 of the distance between reinforcement and the face of the concrete member in which it is placed.
4. Aggregate of 3/4" size shall be used in all structural members where larger aggregate is not permitted by the preceding paragraph.

C. Water shall be from an approved source, potable, clean, and free of oils, salt, alkali, organic matter and other deleterious material.

D. Admixtures: (coordinate with the requirements of Section 2.6)

1. Mid-Range Water Reducing Agent: Shall conform to the requirements of ASTM C494, Type A, and shall be "MIRA 70" by W. R. Grace & Company or approved equivalent. A mid-range water reducing agent shall be utilized in all classes of concrete.
2. High-Range Water Reducing (HRWR) Admixture (Super Plasticizer): Shall comply with ASTM C494, Type F or Type G and shall contain not more than 0.05% chloride ions. A high-range water reducing agent shall be utilized in all concrete with a water cement ratio less than 0.45. High-range water reducing admixtures shall be by one of the following, or approved equivalent:

    a. "ADVA Series", by W.R. Grace & Co.
    b. "Eucon 37", by The Euclid Chemical Co.
    c. "Sikament", by Sika Chemical Corp.
    d. Or approved equivalent.

3. Air-Entraining Admixture: Shall be utilized in all classes of concrete and shall comply with ASTM C260. Air-entraining agent must be by same manufacturer as water-reducing agent and shall be one of the following, or approved equivalent:

   a. "Darex II" by W. R. Grace & Co.
   b. "Airmix or Perma-Air", by The Euclid Chemical Co.
   c. "MB-VR", by Master Builders.
   d. Or approved equivalent.

4. Water-Reducing Set Retarders: Shall conform with ASTM C494 Type D and may be used when ambient temperatures exceed 80 degrees F. Set retarders shall be one of the following, or approved equivalent:

   a. "Daratard-17", by W. R. Grace & Co.
   b. "Eucon Retarder", by The Euclid Chemical Co.
   c. "Pozzolith 100-XR", by Master Builders.

5. Accelerator Admixture: Non-chloride and non-corrosive accelerators shall conform to ASTM C494 Type C and may be used when temperatures are below 50 degrees F. The accelerator admixture shall be one of the following, or approved equivalent:

   a. "Polarset", by W. R. Grace & Co.
   b. "Accelguard 80", by The Euclid Chemical Co.
   c. "Pozzutec 20", by Master Builders.

6. Prohibited Admixtures: The use of calcium chloride, thiocynanates and other admixtures containing greater than 0.05% chloride ions shall not be accepted.

2.2 CONCRETE REINFORCEMENT

A. All reinforcing steel shall conform to ASTM Specification A-615 Grade 60, deformed bars, unless noted otherwise.

B. Welded wire fabric shall conform to ASTM Specification A-185. Supply in flat sheets.

C. Bar supports, metal accessories and other devices necessary for proper assembly of concrete reinforcing shall be of standardized factory-made wire bar supports. All bar supports in exposed concrete shall have plastic tips to prevent rust spots on exposed surfaces. Wire for tieing shall be 18 gauge black annealed wire conforming to ASTM Specification A-82.

D. All reinforcing steel which is required to be welded shall conform to ASTM A706.

E. Precast concrete blocks or bar supports with base plates shall be utilized to support reinforcement for slabs-on-grade.

2.3 FORMWORK

A. Forms: Except for exposed surfaces, formwork material shall be exterior "plyform" Class 1, B-B or as approved by the Architect, not less than 5/8 in. thick. For all exposed surfaces plywood forms shall be plastic coated, molded fiberglass or smooth coated material subject to the approval of the Architect. Provide suitable form inserts for reglets, rustication joints and chamfers as required on the Architectural Drawings. Unless noted otherwise, chamfer strips shall be half-inch, 45 degree poplar wood strips nailed six inches on center and installed at inside corners of all forms.

B. Form Oil: Oil shall be of a non-staining type, a specifically manufactured for concrete forms.

C. Form Ties: Except for exposed surfaces, factory-fabricated, removable or snap back, of approved design. Wire shall be at least 1-1/2 in. back from surfaces. For all exposed concrete work forms shall be tied in such a way that no evidence of ties is visible on the finished surfaces.

D. Design Criteria:

1. Design, construct, erect, support, brace, maintain and remove forms to comply with ACI 318 parts 1, 2 and 3.
2. Comply with ACI 347 for loads, lateral pressures and allowable stresses and include wind loads.
3. Construct formwork so concrete surfaces comply with ACI 301 Chapter 4 and ACI 347.
4. Maximum allowable deflection of forming surfaces from concrete pressure is length/360 between supports.

2.4 ASSOCIATED MATERIALS

A. Non-Shrink Grout: Shall be "Embeco 153" by Master Builders, "Sonogrout" by Sonneborn Building Products, "Five Star Grout" by U.S. Grout Corporation, or equal approved by the Architect. Compressive strength of grout shall not be less than 5000 psi at 7 days, and 7500 psi at 28 days.

B. Patching Compound: Shall be "SIKATOP 122" by Sika Corporation, or equal approved by the Architect.

C. Concrete curing methods for non-exposed concrete floor slabs shall be one of the following:

1. Application of absorptive mats or fabric kept continuously wet.
2. Continuous application of steam (not exceeding 150 degrees F.) or mist spray.
3. Application of waterproof sheet material conforming to ASTM C171.
4. Application of white polyethylene sheeting (4 mils thick) conforming to ASTM C171.

D. Concrete inserts shall be as required on the Drawings. Sleeves shall be schedule 40 PVC or standard weight pipe conforming to ASTM A53.

E. Joint Filler: Where used with caulking or sealants shall be non-extruding, self-expanding filler strips conforming to ASTM D1752, Type III, and AASHO N153, Type II, as manufactured by Celotex Corporation, W.R. Meadows, Inc., W.R. Grace and Company, or equal approved by the Architect. Where no sealant or caulking is required, strips may be non-extruding bituminous type in accordance with ASTM D1751.

F. Chamfer Strips shall be wood.

G. Bonding Agent: Shall be "Sika" Armatec 110 EpoCem, or approved equal.

H. All other materials not specifically described herein, but required for a complete and proper installation, shall be as selected by the Contractor and approved by the Architect.

2.5 STORAGE OF MATERIALS

A. All materials shall be stored to prevent damage from the elements and other causes.

B. Cement and aggregates shall be stored in such a manner as to prevent deterioration or intrusion of foreign mater. Any materials which have deteriorated, or which have been damaged, shall not be used for concrete.

C. Store reinforcement steel on wood skids to protect it from weather, oil, earth and damage from trucking or other construction operations. Reinforcement shall be free from loose mill scale, rust, form oil, concrete splatter and other extraneous coatings at the time it is embedded in the concrete.

2.6 CONCRETE MIXES FOR CAST-IN-PLACE CONCRETE

A. Strength, cement and water requirements

Design Comp. Str. f'c	Min. Lab. Str. Testing Age 7 Days	28 Days	Min. Cem.Fac. Sacks/cu.yd.	Maximum Net Water* Gal/sack cem.
3000 psi	2475 psi	3500 psi	5.5	6.5
4000 psi	3300 psi	4670 psi	6.5	5.0

* This is total water in mix at time of placement, including free water of aggregates and liquid mixtures.

** NOTE: For exposed to weather concrete, the maximum water/cement ratio shall be 0.45. Use high-range water reducing admixtures for water/cement ratio equal to or less than 0.45.

** NOTE: For all concrete with a water/cement ratio greater than 0.45, use a mid-range water reducing agent.

B. Air-entraining and water-reducing agents shall be used in all concrete in strict accordance with the manufacturer's printed instructions. Total air entrained in freshly-mixed concrete shall be 5.0% (plus or minus 1.0% of volume of concrete) for all exposed concrete. Interior slabs and concrete work not exposed to weather shall contain 2% (plus or minus 1% of volume of concrete) with required strengths maintained.

C. Slump of concrete:

1. Exterior walks, pads, and footings: 5" (max).
2. All other concrete elements: 5", 7" (max) at HRWR (if utilized).

D. Premix admixtures in solution form and dispense as recommended by the manufacturer. Include the water in the solution in the design water content of the mixtures.

PART 3 - EXECUTION

3.1 FORMING FOR CAST-IN-PLACE CONCRETE

A. ACI 301, latest edition, "Specifications for Structural Concrete for Buildings", Chapter 4 - Formwork, is hereby made a part of this Specification.

B. Forms shall be constructed to conform to shapes, lines, and dimensions shown, plumb and straight, and shall be maintained sufficiently rigid to prevent deformation under load. Forms shall be sufficiently tight to prevent the leakage of grout. Securely brace and shore forms to prevent the leakage of grout. Securely brace and shore forms to prevent their displacement and to safely support the construction loads.

C. Treat forms with a form release agent applied according to the manufacturer's instructions, by roller, brush or spray to produce a uniform thin film without bubbles or streaks. Apply the release agent in two coats for the first use of the form and in one coat for each additional use.

D. ACI-301, Section 13.3 - Forms, is also hereby made a part of this Specification.

E. Forms and shoring for all slabs and beams (where required) shall remain in place until the full specified 28 day compressive strength is achieved.

3.2 MIXING PROCESS FOR CAST-IN-PLACE CONCRETE

A. Ready-mixed concrete shall be mixed and transported in accordance with Specification for Ready-Mixed Concrete" ASTM C94, Alt No. 3 and ACI STANDARD 304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".

3.3 REINFORCING FOR CAST-IN-PLACE CONCRETE

A. ACI 301, latest edition, "Specification for Structural Concrete for Buildings", Chapter 5 - Reinforcement, is hereby made a part of this Section.

B. Reinforcement shall be placed in accordance with the latest requirements of CRSI, "Placing Reinforcing Bars" and "Recommended Practice for Placing Bar Supports" and with the following requirements:

1. Reinforcement shall be continuous through construction joints unless otherwise indicated on the Drawings.
2. Reinforcement shall be spliced in accordance with the requirements as indicated on the Drawings.
3. Prior to placing concrete, the Contractor shall check all reinforcement after it is placed to insure that reinforcement conforms to the Contract Documents and approved Shop Drawings.
4. Do not bend, weld or cut reinforcement in the field in any manner other than as shown on the Drawings.

3.4 EMBEDDED ITEMS FOR CAST-IN-PLACE CONCRETE

A. Coordinate the installation of all inserts required by other trades. Such inserts normally are to be in place prior to the placing of reinforcing steel.

B. Place all required anchor bolts, anchor plates and dowels. All anchor bolts shall be set to correct locations by template.

C. ACI 301, "Specification for Structural Concrete for Buildings", Sections 6.4 and 6.5, are hereby made a part of this Specification.

3.5 JOINTS FOR CAST-IN-PLACE CONCRETE

A. ACI 301, "Specifications for Structural Concrete for Buildings", Sections 6.1, 6.2 and 6.3 are hereby made a part of this Specification.

B. Construction joints shall be as shown on the Drawings and shall be formed with keyed bulkheads. Unless otherwise noted on the drawings, construction joints in all concrete foundation walls shall not exceed 40 linear feet.

C. Control joints shall be as noted on the drawings. Unless otherwise noted on the Drawings, control joints in all paving slabs shall not exceed 150 s.f. and the maximum distance between joints in any direction shall not exceed 30 feet.

D. Saw-cutting of slabs-on-grade must occur within a maximum of 24 hours after the start of concrete placement. Fill all saw-cut joints in concrete slabs which are to remain

exposed with a modified epoxy joint sealant. Joints shall not be permanently filled until just prior to the completion of the Project. Joints which are to be covered with tile or carpeting shall have joints filled with cement grout flush to the slab surface.

E. As an alternative at slabs which do not remain exposed, control joints may be formed using Zip-Cap control joint (Model 832) by Greenstreak Plastic Products Company or approved equal. Installation shall be in strict accordance with the manufacturer's recommendations. Note that reinforcing steel will have to be depressed at the joints to permit placement of the Zip-Cap.

3.6 PLACING OF CAST-IN-PLACE CONCRETE

A. Notify the Architect at least 24 hours prior to each placement.

B. Do not place concrete until reinforcing steel, inserts, sleeves and other work to be built into the concrete have been inspected and approved by the Architect or the Owner's representative and by all other trades concerned.

C. In hot weather, all concreting shall be done in accordance with ACI 305, "Recommended Practice for Hot Weather Concreting".

1. When temperature rises above 70 degrees F., all surfaces of concrete shall be protected against rapid drying.
2. Concrete delivered to the forms shall have a temperature of not over 90 degrees F.
3. The temperature of the forms shall be not over 90 degrees F.

D. In cold weather, all concreting shall be done in accordance with ACI 306, "Recommended Practice for Cold Weather Concreting".

1. When the average daily temperature falls below 40 degrees F., all surfaces of concrete shall be maintained at a temperature of at least 50 degrees F, and not over 90 degrees F, for seven (7) days.
2. Concrete delivered to the forms shall have a temperature of at least 60 degrees F, and not over 90 degrees F.
3. The temperature of the forms shall be at least 40 degrees F.
4. The Contractor shall maintain a record of temperature of the concrete at the most exposed surfaces of each placement at the beginning and at the end of each day of the curing period, which record shall be available to the Architect.

E. Conveying: Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients and in a manner which will assure that the required quality of the concrete is retained.

F. Depositing: Delivery and placement of concrete shall be programmed so that the time lapse between batching and placement shall not exceed 1-1/2 hours. Concrete shall not

be allowed a free fall of over 6 feet. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing.

G. Concrete shall be deposited continuously, in horizontal layers of such thickness (not deeper than 18 inches) that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the Section. Placing shall be carried out at such a rate that the concrete which is being integrated with fresh concrete is still plastic. Concrete which has partially hardened or which has been contaminated by foreign materials shall not be deposited.

H. Concrete shall be compacted thoroughly by vibrating to produce a dense, homogeneous mass without voids or pockets. Vibrators should be placed in concrete so as to penetrate approximately 3 inches to 4 inches into the preceding lift so as to blend the two layers. Vibrating techniques must assure that, when the coarse aggregate reaches the form, it stops and the matrix fills the voids.

I. The Contractor shall become familiar with ACI-303, Chapter 7 regarding Placing and Consolidation of Architectural Concrete. All applicable recommendations contained within ACI-303 shall be strictly followed.

J. Patching: Areas to be patched shall not exceed 1.5 square feet for each 1000 squares of surface area. Surface preparation and application of the patching compound specified in item 2.4.B shall be in strict accordance with the manufacturer's written directions. Patches shall match in every respect the color and texture of the surrounding surfaces. Mix formulation shall be determined by trial to obtain a color match when both the patch and surrounding concrete are cured and dry. After initial set, surfaces of patches shall be textured manually to obtain a match with the surrounding surfaces. All patches are subject to Architect's final acceptance as to appearance and quality. At holes formed by withdrawal of ends of steel snap-ties, wet and pack solid with patching mortar. Smooth out projections and fins with wet carborundum stones or power grinders. All voids, honeycombs and air pockets shall be patched. The Contractor shall make every reasonable effort to avoid voids, honeycombs and air pockets.

K. Concrete surfaces exposed to view and as directed by the Architect in the finished building shall receive a smooth rubbed finish. No later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

3.7 FINISH OF CONCRETE SLABS

A. A pre-slab meeting is required between the architect, the contractor, the concrete subcontractor, representatives supplying and installing the epoxy flooring, and representatives supplying and installing the resilient flooring. No concrete shall be

placed until this meeting is attended and completed. All parties must be present for this item to be considered completed.

B. ACI-301, latest edition," Specification for Structural Concrete for Buildings", Chapter 11 - Slabs is hereby made a part of this Specification.

C. Use a “troweled finish” for all slabs except as follows:

1. Ramps and exterior slabs shall have a “broom” finish, unless noted otherwise.
2. Where resinous epoxy flooring is scheduled in the kitchen, receiving and janitor’s closet, provide a mechanical profile equal to ICRI CSP 3-4 Profile. Coordinate with the architectural drawings.

D. Finished slab surfaces for slabs-on-grade shall conform to Class B tolerances. Minimum Face Floor Profile Numbers shall be F_F30/F_L20 (for the overall average) and a local minimum of F_F20/F_L15. The Playroom slab shall be F_F50/F_L30 (minium).

3.8 FINISH OF NON-ARCHITECTURAL CONCRETE SURFACES (other than slabs, and walks)

A. Immediately upon removal of forms, point all form tie holes and other defects flush with surface, or as otherwise directed by the Architect.

B. Remove all fins, and fill all honeycomb, holes and depressions with 1:2 mortar on all exposed interior and exterior concrete surfaces. Before patching, thoroughly wet surrounding concrete and keep wet for several hours. Brush into the surface to be patched a grout of cement and water mixed to the consistency of paint. Carefully damp cure these patches.

C. For non-architectural exterior or interior surfaces to remain unfinished and exposed to view, the surfaces, while concrete is "green", shall be wet, and rubbed with carborundum brick or other approved abrasive. Remove all fins, burrs, joint marks, and other projections, until uniform color and texture are produced. Any excess paste shall be removed. No cement grout or slush shall be used other than the cement paste drawn from the "green" concrete by the rubbing process. Wet rubbing shall not be required in storage and similar utilitarian spaces.

D. Exterior or interior surfaces to receive paint or special coatings shall be finished as above, except uniform color and texture shall not be required.

E. Concrete surfaces to receive waterproofing shall be cleaned and patched as above, remove all fins and fill all voids. Wet rubbing shall not be required on surfaces to receive waterproofing.

F. Exposed concrete walls and pilasters shall have a smooth finish.

G. Use chamfers at the edges of all exposed concrete.

3.9 FINISH OF CONCRETE STOOPS AND WALKS

A. Concrete stoops and walks shall be properly struck-off floated and finished with a fine broom finish or as otherwise noted. All joints and edges shall be tooled.

B. Provide textured surfaces on all exterior concrete ramps.

C. A sample area (10 sq. feet minimum) shall be finished and approved by the Architect prior to proceeding with the Work.

D. All surfaces shall be properly damp cured.

3.10 CURING AND PROTECTION

A. Protect newly placed concrete against low and high temperature effects and against rapid loss of moisture.

B. For vertical or near-vertical surfaces, moist cure by keeping the form in contact with the concrete, or by other effective means approved by the Architect. Intermittent wetting and drying does not provide acceptable curing.

C. Cure floor slabs by methods indicated in 2.4.D.

D. In hot weather, be adequately prepared to protect the concrete from the adverse influence of heat before the placement of any concrete. Take special precautions to avoid cracking of the concrete from rapid drying during placement of concrete when air temperature exceeds 70 degrees F., particularly when the work is exposed to direct sunlight.

1. Cool forms by fog sprayed with water or by protecting them from the direct rays of the sun.
2. If requested by the Contractor, deemed advisable by the Testing Engineer, and approved by the Architect, a retardant may be used to delay the initial set of the mix.

E. In cold weather, be adequately prepared to protect the concrete from the adverse influence of cold before placement of any concrete.

1. When the average daily temperature falls below 50 degrees F., take special precautions to assure adequate strength gain of the concrete.

2. When the average daily temperature falls below 40 degrees F., prepare concrete with heated materials such that the concrete delivered to the forms shall have a temperature of at least 60 degrees F., and not over 90 degrees F. Prewarm the

forms to at least 40 degrees F., to prevent the rapid cooling of the concrete by their contact; keep forms free of all ice and snow. When heated materials are being used, combine the water with the aggregate in the mixer and keep the resulting temperature below 90 degrees F. before cement is added to the mix. Protect all concrete by the use of heated enclosures which must be sufficiently strong and windproof and within which adequate heaters are properly distributed to maintain all concrete at the required temperatures. Do not allow heaters to locally heat or dry the concrete and do maintain adequate fire precautions.

3.11 ACCEPTANCE

A. When the tests on control specimens of concrete fall below the required strength, the Architect shall have the right to require, at the Contractor's expense, mix redesign, load tests and/or strengthening as directed, and/or removal and replacement of those parts of the structure in which such concrete was used.

3.12 CUTTING OF HOLES

A. Cut holes required by other trades in any cast-in-place concrete which did not receive sleeves. Use a core drilling process or sawing process which produces clean sharp edges and the minimum hole size which accommodates the piping, conduit, or equipment requiring the opening. Locations of holes and payment for this work will be by other trades and must be approved by the structural engineer.

B. Obtain approval of Architect before cutting any holes for any trades.

3.13 EPOXY BONDING

A. Where required, new concrete shall be bonded to hardened new concrete or existing concrete in accordance with the adhesive manufacturer's instructions.

3.14 CLEANING

A. The exposed faces of the cast-in-place concrete shall be cleaned of all stains, water marks, and leaked fines.

3.15 REMOVAL OF FORMWORK, SHORING AND RESHORING

A. Contractor shall be responsible for proper removal of formwork shoring, and reshoring.

B. Remove vertical forms as soon as concrete has attained sufficient strength to support its own weight and their removal can be done without damage to the concrete. Apply curing compound immediately after removing forms.

C. Keep horizontal forms and supports in place for not less than minimum periods of time noted below or until concrete has reached 60 percent of its specified strength.

1. Soffits of beams or girders shall remain in place until concrete has attained 600 day-degrees.
2. Forms of floor slabs shall remain in place until concrete has reached 400 day-degrees. Definition of day-degrees: Total number of days or fractions of days times mean daily air temperature at surfaces of concrete; where concrete surface is protected by insulated blankets or formwork, temperature may be taken under the blankets or formwork. For example, five days at temperature of 60 degrees F. equals 300 day degrees. Days or fractions of days in which temperature is below 50 degrees F. shall not be included in calculation of day-

D. When forms are removed, place reshores at same time as stripping operations so that no unshored area is larger than one-fourth of a slab panel. Allow no live load on slab when stripping and shoring are being done.

E. Field cure test cylinders under same conditions as concrete they represent in order to verify minimum strengths for form removal. Such cylinders and testing shall be at the Contractor's expense.

3.16 CLEAN-UP

A. Remove all scrap and debris from work of this Section from the job site daily.

End of Section

SECTION 13 34 19
METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
   1. Building primary framing.
   2. Building secondary framing.
   3. Exterior door and frames.
   4. Exterior metal panels, horizontal.
   5. Exterior metal panels, insulated vertical, two colors.
   6. Exterior roof panels, insulated.
   7. Exterior trim and accessories.
   8. Gutters and downspouts.
   9. Exterior window assemblies.
   10. Snow guards.

1.3 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

1.4 SUBMITTALS

A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.
   1. Anchor-Bolt Plans: Submit anchor-bolt plans and templates before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
   2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.

3. Loading Requirements: For each pier foundation in sufficient detail to allow the Structural Engineer to ensure the foundation design can accommodate the proposed steel structure.

C. Samples for Initial Selection: For units with factory-applied color finish.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:
   1. Metal Panels: Nominal 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
   2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.
   3. Accessories: Nominal 12-inch- long Samples for each type of accessory.

E. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional structural engineer responsible for their preparation.

F. Welding certificates.

G. Metal Building System Certificates: For each type of metal building system, from manufacturer.
   1. Letter of Design Certification: Signed and sealed by a qualified professional structural engineer. Include the following:
      a. Name and location of Project.
      b. Order number.
      c. Name of manufacturer.
      d. Name of Contractor.
      e. Building dimensions including width, length, height, and roof slope.
      f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
      g. Governing building code and year of edition.
      h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
      i. Equipment loads.
      j. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
      k. Building-Use Category: Indicate category of building use and its effect on load importance factors.
   2. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.

H. Erector Certificates: For each product, from manufacturer.

I. Manufacturer Certificates: For each product, from manufacturer.

J. Material Test Reports: For each of the following products:
   1. Structural steel including chemical and physical properties.
   2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   3. Tension-control, high-strength, bolt-nut-washer assemblies.
   4. Shop primers.
   5. Nonshrink grout.

K. Field quality-control reports.

L. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.
   1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
   2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional structural engineer.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

C. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

D. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.3, "Structural Welding Code - Sheet Steel."

F. Structural Steel: Structural steel materials, workmanship, and details shall conform to the latest editions of the AISC 360 “Specification for Structural Steel Buildings” and the AISC “Code of Standard Practice for Steel Buildings and Bridges”.

G. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

H. Preinstallation Conference: Conduct conference at Project site, in accordance with Division 01 requirements.
   1. Review methods and procedures related to metal building systems including, but not limited to, the following:

a. Condition of foundations and other preparatory work performed by other trades.
b. Structural load limitations.
c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
d. Required tests, inspections, and certifications.
e. Unfavorable weather and forecasted weather conditions.
f. Allowable staging areas.

3. Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:
    a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
    b. Structural limitations of purlins and rafters during and after roofing.
    c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
    d. Temporary protection requirements for metal roof panel assembly during and after installation.
    e. Roof observation and repair after metal roof panel installation.
4. Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:
    a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
    b. Structural limitations of girts and columns during and after wall panel installation.
    c. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
    d. Temporary protection requirements for metal wall panel assembly during and after installation.
    e. Wall observation and repair after metal wall panel installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements:
   1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions through the use of a template.
   2. Established Dimensions for Metal Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating metal panels without field measurements, or allow for field trimming metal panels. Coordinate construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.8 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Section 033000 - CAST-IN-PLACE CONCRETE.

B. Coordinate metal panel assemblies with flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
   1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL BUILDING SYSTEMS

A. Description: Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
   1. Provide metal building system addition of size and with bay spacings, roof slopes, and spans to match the existing structure. Refer to Drawings.

2.2 METAL BUILDING SYSTEM PERFORMANCE

A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional structural engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
   1. Design Loads: As required by Code and as indicated on Drawings.
   2. Equipment loads.
   3. Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.

C. Seismic Performance: Metal building systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

D. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

E. Air Infiltration for Metal Roof Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at negative test-pressure difference of 1.57 lbf/sq. ft.

F. Air Infiltration for Metal Wall Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of wall area when tested according to ASTM E 283 at static-air-pressure difference of 1.57 lbf/sq. ft.

G. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft.

H. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft.

I. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580.

2.3 STRUCTURAL-STEEL FRAMING

A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
   1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
   2. Frame Configuration: Gable, symmetrical with clear span main frame

B. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating.

C. Bracing: Provide adjustable wind bracing.

D. Bolts: Provide plain-finish bolts for structural-framing components that are primed or finish painted. Provide hot-dip galvanized bolts for structural-framing components that are galvanized.

E. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.
   1. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil.
      a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.
   2. Prime galvanized members with specified primer after phosphoric acid pretreatment.
   3. Primer: SSPC-Paint 15, Type I, red oxide.

2.4 METAL PANELS

A. Standing-Seam Metal Roof Panels: Formed with ribs at panel edges and between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.
   1. Clips: Manufacturer's concealed standard.
   2. Joint Type: Mechanically seamed, folded according to manufacturer's standard.
   3. Design Profile: Ribbed flat panel, batten-locked equal to BattenLok HS by MBCI.

B. Insulated Metal Wall Panels: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and insulation core foamed-in-place during fabrication

with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.

1. Profile – Panel A: Striated panel equal to eco-ficient series Summit Insulated Wall Panel by MBCI. See drawings for required R-Value. Provide color as selected by the Architect.
2. Profile – Panel B: Striated panel equal to eco-ficient series Summit Insulated Wall Panel by MBCI. See drawings for required R-Value. Provide color as selected by the Architect.

C. Materials and Finishes:
   1. Metallic-Coated Steel Sheet: Restricted-flatness steel sheet, metallic coated by the hotdip process and primed by the coil-coating process to comply with ASTM A 755/A 755M.
      a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
      b. Thickness: 0.034-inch nominal.
      c. Surface: Smooth, flat finish.
   2. Exposed Coil-Coated Finish:
      a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
         1) Colors: Provide three colors as selected by the Architect.
   3. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.5 THERMAL INSULATION

A. Unfaced Metal Building Roof Insulation: ASTM C 991, Type I, or NAIMA 202, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch-wide, continuous, vapor-tight edge tabs; with a flamespread index of 25 or less.
   1. R-Value: R-38.
   2. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm when tested according to ASTM E 96/E 96M, Desiccant Method.
      a. Composition: White polypropylene film wrap.

B. Fall Protection Liner Fabric: Provide unfaced fiberglass blanket insulation and edge fall protection system equal to Energy Saver FP by Guardian.

C. Wall Insulation
   1. Steel Strap: Cold rolled structural steel grade 50 class 1, zinc coated, rimed and painted for corrosion resistance, 0.022 in. by 1 in.
   2. Fasteners: Use 12-14 TY3 3/4” self-drilling fasteners with 3/4” OD washers, for up to 1/4” thick, light gauge steel (typically purlins). For heavier gauge steel (typically primary framing), up to 3/8”, use 12-24 TY5 1 1/4” self-drilling fasteners with a

banding clip. All fasteners shall be colored to match fabric color. Energy Saver FP banding clips to be installed per Guardian Building Products' instructions.

3. Sealants: Shall be fast-tack solvent-based synthetic rubber adhesive for sealing Energy Saver FP fabric laps and edges. Two-sided tape approved by Guardian Building Products may be substituted for synthetic rubber adhesive.
4. Insulation: R-21.
5. Insulation Hangers: Shall be Insul-Hold coils for supporting insulation between wall girts at frequency specified by manufacturer.
6. Fabric: Woven reinforced high-density polyethylene yarns coated on both sides with a continuous white or colored polyethylene film. This material shall be manufactured in large custom fit pieces by hot air welding from roll goods. Pieces shall be fabricated to substantially fit the large defined building areas with minimum practical sealing to be done on job site. Fabric shall be folded or rolled to allow for rapid pullout on the strap support system.
7. Accessories:
    a. Manufacturer's recommended adhesive to bond the fabric to the steel framing and a disposable brush.
    b. Self-drilling fasteners, 12-14 TY3 3/4" to connect the banding to the purlins/girts, and heavy-duty fasteners 12-24 TY5 1 1/4" to connect the banding to the rafters.
    c. Banding clips for attachment of bands.

2.6 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
    1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

D. Flashing and Trim: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.

E. Louvers: Provide as needed for HVAC equipment.

F. Snow Guards to be installed at west side of roof: Prefabricated, noncorrosive units designed to be installed without penetrating sheet metal roofing, and complete with predrilled holes, clamps, or hooks for anchoring.
   1. Seam-Mounted, Bar-Type Snow Guards: Aluminum rods or bars held in place by stainless-steel clamps attached to vertical ribs of standing-seam sheet metal roofing.
      a. Aluminum Finish: Match roofing.
      b. Available Products:
         1) Alpine Snow Guards, Div. of Vermont Slate & Copper Services, Inc.; Model No. 05-98.
         2) LMCurbs; S-5! SnoFence.
         3) Snow Management Systems, a division of Contek, Inc.; Vermont Snowguard.

2.7 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.
   1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
   2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by rollforming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
   1. Engage land surveyor to perform surveying.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional structural engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
   3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with doublenutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
   1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.
      a. Joint Type: Snug tightened or pretensioned.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
   1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
   2. Locate and space wall girts to suit openings such as doors.
   3. Provide supplemental framing at entire perimeter of openings, including doors, louvers, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
   1. Tighten rod and cable bracing to avoid sag.
   2. Locate interior end-bay bracing only where indicated.

I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

A. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.
   1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

B. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for doors, louvers, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
    a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

C. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
    1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

E. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
    1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
    2. Prepare joints and apply sealants to comply with requirements in Section 079200 - JOINT SEALANTS.

3.5 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
    1. Flash and seal metal roof and wall panels where new panels meet existing building.
    2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Joint: Fasten seams and completely engage with sealant, to match existing.
4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels for fasteners.
5. Provide metal closures at connection to existing construction and rake edges.

3.6 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
   2. Shim or otherwise plumb substrates receiving metal wall panels.
   3. When two rows of metal panels are required, lap panels 4 inches minimum.
   4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
   5. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
   6. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
   7. Install screw fasteners in predrilled holes.
   8. Install flashing and trim as metal wall panel work proceeds.
   9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
   10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
   11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

3.7 INSULATION INSTALLATION

A. Comply with manufacturer’s written instructions.

3.8 EXTERIOR DOORS AND FRAMES INSTALLATION

A. General: Install exterior door and frames plumb, rigid, properly aligned, and securely fastened in place according to manufacturers' written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.

B. Set thresholds for exterior doors in full bed of butyl-rubber sealant complying with requirements specified in Section 079200 - JOINT SEALANTS.

3.9 WINDOW INSTALLATION

A. General: Install windows plumb, rigid, properly aligned, without warp or rack of frames or sash, and securely fasten in place according to manufacturer's written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each window frame with elastomeric sealant used for metal wall panels.
   1. Separate dissimilar materials from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in AAMA/WDMA/CSA 101/I.S.2/A440.

B. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.

C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

D. Mount screens directly to frames with tapped screw clips.

3.10 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
   1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
   1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

C. Louvers: Locate and place louver units level, plumb, and at indicated alignment with adjacent work.
   1. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
   2. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.
   3. Protect galvanized- and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of corrosion-resistant paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
   4. Install concealed gaskets, flashings, and joint fillers as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 - JOINT SEALANTS for sealants applied during louver installation.

D. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.

E. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.11 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
   1. Inspection of fabricators.
   2. Steel construction.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Tests and Inspections: Conform to Chapter 17 of the Massachusetts State Building Code, 7th Edition.
   1. High-Strength, Field-Bolted Connections: Connections shall be tested and inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
   2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:

D. Product will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.12 ADJUSTING

A. Doors: After completing installation, test and adjust doors to operate easily, free of warp, twist, or distortion.

B. Door Hardware: Adjust and check each operating item of door hardware and each door to ensure proper operation and function of every unit. Replace units that cannot be adjusted to operate as intended.

3.13 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

C. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
   1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
   2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

D. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
   1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

E. Doors and Frames: Immediately after installation, sand rusted or damaged areas of prime coat until smooth and apply touchup of compatible air-drying primer.
   1. Immediately before final inspection, remove protective wrappings from doors and frames.

F. Louvers and Windows: Clean exposed surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.
   1. Restore louvers and windows damaged during installation and construction period so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
      a. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION

SECTION 13 45 00
MODULAR CONSTRUCTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this section.

1.2 SCOPE

A. The building is to be constructed "off-site" and shall be 80% to 90% or more substantially completed at the builder's facility except for any items identified in the scope of work to be performed at site by others: (e.g.: foundations, utility connections, etc.). The construction of the building must use a "Build Together" process, where all sections of the structure are attached and built both vertically and horizontally, as a complete building to ensure precise fit and finish. Any type of assembly line construction of the building units will not be accepted unless approved in writing by the Architect or Owner.

B. Once completed, the building shall be separated into transportable building sections that are single-sheet-shrink-wrap protected and transported to the project site at completion of the site foundations. All building sections must be delivered on low boy "air ride" transporters only. Building sections that are delivered on self-contained running gear (axles) with integral bolt-on type hitch will not be acceptable.

C. Building sections shall include all finishes, specialties, accessories, plumbing (piping and fixtures), sprinkler if specified, mechanical and electrical systems, (including duct, diffusers, wiring, outlets, fixtures and devices) except for any low voltage wiring systems (which shall be provided and installed on site).

D. Place building sections on site fabricated foundations and weld to foundation base plates. Complete all required inter-connections using structural grade bolts and/or connector weld plates.

E. Complete a scope of work sheet for items not completed at the builder's facility. Ship loose items shall be cataloged and marked for proper placement and use in each section.

1.3 SITE INSPECTIONS

A. Visit the site and become thoroughly familiar with all existing conditions and notify the Architect, in writing, of any issues prior to bidding project.

1.4 REFERENCE STANDARDS

A. Refer to the technical specifications for applicable standards.

1.5 SUBMITTALS

A. The "Off-Site" builder shall work directly from the Architect's plans and specifications and provide only a complete set of structural steel design drawings showing all materials, assemblies, connection details, and required structural design information as required for authorities having jurisdiction. Drawings shall be certified as required by the appropriate design professionals and submitted to the State authorities under the Massachusetts State Approval Program.

B. Designs shall take into account all live and dead loads and all imposed wind and snow drift loads, seismic conditions, transportation, and rigging loads as required, ensuring the owner receives a building of sound quality.

C. Drawings as provided by the Builder shall clearly indicate point loads and layout for design of foundation.

D. In addition, the Builder shall provide submittals as may be specified by the owner or architect for review and approval.

E. Design drawings shall include all construction connection/expansion details where the new building will be directly connected to the owner's existing facility.

1.6 APPLICABLE STANDARDS

A. Refer to the other Divisions of the Contract Documents for applicable standard requirements.

1.7 QUALITY ASSURANCE

A. The Builder shall be responsible to have the building sections and systems inspected and tested at the facility as required, for operation, quality, and conformance to design drawings and codes. The Architect will confirm compliance to the Build-Together process through scheduled inspections.

B. Comply with all Massachusetts state building and accessibility codes including any requirements indicated or imposed by authorities having jurisdiction. Submit copies of all code related correspondences and inspection reports to the Architect.

C. The Builder must fabricate all structural steel components utilizing only welders that have current welding certification and testing documentations on file. Welded structural steel components must have a certificate of inspection by an independent third party weld testing agency. A copy of all weld inspection reports shall be forwarded to the Architect.

D. All poured concrete shall be slump and strength tested with all copies of reports to be sent to the Architect.

E. All plumbing, HVAC duct work, and fire protection systems and connections shall be tested prior to shipping. A copy of all test reports shall be forwarded to the Architect.

F. All electrical circuits shall be fully connected tagged, and load tested prior to shipping.

G. Document each phase of construction via digital photographs and submit to the Customer and/or Architect each month.

PARTS 2 – PRODUCTS

2.1 PERMANENT "OFF-SITE" BUILDING MANUFACTURERS

A. Specified Materials: Only those materials that are specified in their respective Divisions in the General Specifications, or those that are approved for substitution will be acceptable.

B. Permanent "Off-Site" Building Manufacturer: Based on compliance with requirements, provide a permanent building, using the "Build Together" process.

Acceptable Manufacturers:
CAPSYS, New York, New York
DELUXE Building Systems, Berwick, PA
NRB (USA) Inc., New Holland, PA

C. Substitutions: As allowed under the provisions contained in the Instructions to Bidders and General Conditions of the Contract. The Architect must approve in writing any permanent building manufacturer other than the approved manufacturer(s) listed above. A change of the building manufacturer can only be made if requested and/or approved by the Owner or Architect. The requested manufacturer substitution must have been in business for a minimum of 5 years under their current business name, been member recognized as a permanent commercial building manufacturer by the Modular Building Institute, Charlottesville, VA, have proven "Off-Site" building experience and have successfully completed a minimum of 5 projects similar in scope and size. Submission for approval of additional manufacturers must be made no later than 10 days prior to bid date. The Architect or Owner shall require the Bidder to name the building manufacturer used in the bid, on the bid documents.

2.2 MATERIALS

A. Refer to the other Divisions of the Contract Documents for material requirements.

2.3 STRUCTURAL STEEL

A. All structural steel components must be designed and fabricated by the Building Manufacturer. All structural framing shall be designed to suit load and resistance factors per codes and/or specifications.

B. All steel shall be prime coat painted.

C. The following standards are incorporated by reference and shall be considered a part of the specification. Design, fabrication, and erection of steel shall comply with the requirements of these specifications or shall exceed their requirements as may be indicated herein.

- Structural Steel ASTM A36
- Standard Specification for Design of Light Gage Steel, AISC
- Specification for Design, Fabrication and Erection of, AISC Structural Steel for Buildings and Commentary
- Standard Code for Arc and Gas Welding in AM, WELDING SOCIETY
- Building Construction
- Steel Sheet, Zinc-Coated (Galvanized) ASTM A446
- Steel design, foundation, and erection shall conform to AISG Manual of steel construction

2.4 FLOOR CONSTRUCTION

A. The floor construction shall consist of structural steel main beams with steel transverse members and steel decking as required to support all live and dead loads. Floors shall be 3000-psi (or better) concrete, 3" minimum composite thickness with fiber-mesh reinforcing, or as otherwise required due to specified loads, fire rating etc. Concrete shall be 100% monolithically poured for the entire structure and finished ready to accept specified flooring finish with integral break joints for separation at shipment. Pouring of concrete into individual modules, sections, or units and/or hold back of concrete slab at seam lines for pouring on site is not an acceptable practice and will not be permitted. Additionally, floor construction could be optioned as cement board or plywood on structural steel deck.

B. "Bumps" or "Humps" in the floor at each seam line will not be acceptable.

C. Sprayed in place floor insulation, as required by Energy Codes, shall be applied to the underside of the steel floor deck. Insulation draped below the floor system will not be permitted.

D. Floor finish shall be as per Architects finish schedule.

2.5 WALL CONSTRUCTION

A. The building structure is to be designed using engineered structural steel post and beam construction for the skeletal frame with light gauge steel stud wall infill assembly. Wood stud walls will not be acceptable.

B. Exterior walls shall be designed to have rigid type wall insulation over a 6-mil polyethylene vapor barrier over sheathing material, creating superior building envelope design characteristics that significantly improve thermal and moisture protection by moving the dew point (and any resulting possible condensation) to the outside of the wall or approved equal.

C. Exterior sheathing shall be as required in the other Divisions of the Contract Documents or as required by fire codes.

D. All gypsum wall board shall be mechanically fastened. Use of liquid-foam type attachments to wall studs is not an acceptable practice and will not be permitted.

E. "Bumps" in the wall at each seam line (hold back area) will not be acceptable.

F. All walls (except for hold-backs at seam lines) are to receive at minimum tape, spackle, and prime coat at the Building Manufacturers facility. Shipping module units with unfinished gypsum walls or with a pre-wrapped vinyl fabric face and batten trims system will not be permitted unless approved in advance by the Owner.

G. All wallboard shall be installed with a ¾" high continuous plastic spacer at the floor to prevent water and cleaning agents from "wicking" up the wallboard.

2.6 ROOF CONSTRUCTION

A. The roof structure shall be designed to support the specified minimum live loads plus all dead loads for structure, finishes, ground snow loads, imposed snow loads, and building equipment. The roof structure shall consist of spanning structural steel beams with steel purlin members and steel roof deck as structurally required and shall be bolted together at the factory to assure proper on-site re-alignment.

B. Roofing system shall be as specified a single-ply adhered white EPDM roof (.060).

C. The Building Manufacturer shall utilize an approved and licensed roofing applicator in performance of roofing scope of work so as to comply with warranty requirements for on-site completion.

2.7 MECHANICAL SYSTEMS

A. Systems design shall be completed by the off-site contractor and submitted to the Architect for approval.

B. All duct work crossing seam lines shall be bolted or sleeve-seamed. Insulation meant to compress at the mate seam line during building set on site is not an acceptable practice as a duct seam between building sections and will not be permitted.

C. All ductwork shall be galvanized steel with wrap type or internal type insulation, thickness as required by code. Fiberglass type duct board is not acceptable. Flex duct shall be limited to lengths allowed by code.

D. All grills and diffusers shall be minimum 2'x 2' size, commercial grade with collars.

E. Special Requirements:

1. Entire building is to be heated and air conditioned.

2.8 ELECTRICAL SYSTEMS

A. Electrical system design shall be completed by the off-site contractor and submitted to the Architect for approval.

B. All electrical wiring shall be as per Divisional specs.

C. Cross over connections from section to section shall be looped, tagged, and properly identified for connection on site.

D. Home run wiring for mechanical systems shall be provided and completed on site.

E. All low voltage devices, wiring, and systems shall be provided and completed on site.

F. Special requirements:

- Furnish and install ¾" empty conduits and back boxes in walls for IT where shown on plans.
- All lighting should be LED fixtures.

PART 3 – EXECUTION

3.1 PREPARATION

A. Preparation: Each building section shall be provided with permanent concealed lifting or top pick points incorporated into the structural steel design for lifting. Lifting rods and/or under-unit sling points will not be accepted.

B. Each building section shall be suitably braced, single piece shrink-wrapped, and secured for transportation on low boy carriers only.

3.2 INSTALLATION

A. The Building Manufacturer shall arrange and be responsible for all transporting of the sections to site. Transporting equipment shall be retained by the transporter.

B. Skilled workers trained and approved by the Building Manufacturer shall place the modular units in accordance with the builder's instructions.

C. A Project Manager from the Building Manufacturer shall be on site during time of delivery and set to ensure sections are installed in accordance with approved practices and shop drawings, good construction practice, and safe hoisting or rigging procedures to ensure quality control measures are as specified.

D. Verification of Conditions: Verify areas to receive components of this section are free of impediments interfering with access and installation.

3.3 WARRANTY

A. Manufacturer's Product Warranty: Submit manufacturer's standard warranty form for each product as required in the related specifications, Division through (if applicable).
   1. Warranty Period: As listed in the individual material specification sections but in no case less than one year from date of Substantial Completion.
   2. Beneficiary: Issue warranty in legal name of project owner.

B. Extended Warranties: Where extended warranties are listed in other specification sections they shall be passed through from the building module manufacturer to the building Owner at the time of Substantial Completion.

END OF SECTION

SECTION 310000

EARTHWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. The work of the Section consists of all earthwork and related items as indicated on the Drawings and/or as specified herein including, but is not necessarily limited to, the following:

1. General excavation for the building construction including trench excavation and backfilling for building, foundations, utilities and slab.

2. Shoring, sheeting, dewatering.

3. Rock Excavation for footings, slab and interior below slab plumbing.

1.2 RELATED SECTIONS

A. This section is only a portion of the Contract Documents. All of the Contract Documents, including Conditions of the Contract and Division 1 General requirements, apply to this section.

1.3 STANDARDS AND DEFINITIONS

A. The following standards and definitions are applicable to the work of this Section to the extent referenced herein:

1. MHD Specifications: The Commonwealth of Massachusetts, Highway Department, Standard Specifications for Highways and Bridges, including latest revisions.

2. ASTM: American Society for Testing and Materials.

3. Unsuitable material is material that is not satisfactory for its intended purpose. Material such as but not limited to loam, subsoil, organic material, debris, frozen material or weak, soft, and uncompacted soil, including all existing fill, or material containing roots or other organic matter as determined by the Architect shall be considered unsuitable for supporting structures and pavements. Material that is rendered unsuitable through the Contractor's means and methods of construction will not be considered unsuitable for payment purposes even though the Contractor is required to remove and replace the unsuitable material.

4. Rock shall be defined as bedrock or original ledge which cannot be removed by conventional excavating equipment (Komatsu PC650 or equivalent) and would require drills, hoe rams, and/or a rock splitter, as well as individual boulders over two cubic yards in open excavation and over one cubic yard in trenches that are removed by power excavating equipment without the use of drills or explosives.

1.4 SITE CONDITIONS

A. The Contractor shall fully inform himself of existing conditions at the site before submitting his bid, and shall be responsible for carrying out all site work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed because actual conditions are inconsistent with those assumed, except those conditions described in the GENERAL CONDITIONS.

B. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct to the best of the Architect's knowledge, but the Contractor shall have examined them for himself during the bidding period and formed his own conclusions as to the full requirements of the work involved. All earth materials shall be included in the base bid.

C. Boring and test pit logs as well as Existing Conditions are included with this RFP package.

D. The Contractor shall be aware of the following additional information:

1. All sources of water, including surface water runoff and groundwater shall be controlled by the Contractor as part of his base bid price to prevent the underlying material from becoming disturbed and rendered unsuitable for its intended purpose. Trench drains shown on the plans may supplement the Contractor’s method of controlling groundwater but shall not be considered the sole means of groundwater or surface water control. The Contractor shall develop his own means for controlling groundwater although he may use the trench drains as part of his system. If the Contractor uses the trench drains, they shall not become silted or clogged. The Contractor will be required to reinstall or clean the drains to the Architect’s satisfaction at no additional cost to the Owner if they become silted or clogged. The Contractor shall consider opening sections of the site one-at-a-time to preserve the integrity of the underlying soil.

1.5 PERMITS, CODES, AND SAFETY REQUIREMENTS

A. Comply with all rules, regulations, laws and ordinances of the Town of North Andover, the Commonwealth of Massachusetts, and all other authorities having jurisdiction over the project site. The Contractor shall provide all labor, materials, equipment and services necessary to make the work comply with these requirements without additional cost to the Owner.

B. Comply with the provisions of the Manual for Accident Prevention in Construction of the Associated General Contractors of America, Inc., and the requirements of the Occupational Safety and Health Administration, United States Department of Labor.

C. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.

D. The Contractor shall not close or obstruct any street, sidewalk, or passageway without written permission from authorities having jurisdiction. The Contractor shall so conduct his

operations as to interfere as little as possible with the use of roads, driveways, or other facilities near enough to the work to be affected by the work.

E. Any apparent conflict between the Drawings and Specifications and the applicable Codes and Regulations shall be referred to the Architect in writing for resolution before the work is started.

1.6 LAYOUT AND GRADES

A. The Contractor shall maintain and/or establish benchmarks and survey monuments shown on the Drawings or found to exist on the site to provide a base reference for the construction. Replace any that may become destroyed or disturbed. The Contractor shall employ and pay all costs for a registered Civil Engineer or Surveyor who is licensed within the jurisdiction of the project site to lay out all lines and grades in accordance with the Drawings and Specifications, and as necessary or required for the construction. The Contractor shall submit building layout drawings for approval, stamped by a Registered Surveyor. The selection of the registered Civil Engineer or Surveyor shall be subject to the Architect's approval.

B. The words "finished grades" as used herein shall mean final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas shall be given uniform slope between points for which finished grades are indicated or between such points and existing established grades.

1.7 PROTECTION OF EXISTING CONDITIONS

A. The Contractor shall observe all rules and regulations governing the respective utilities in executing work under this Section. All work shall be executed in such a manner as to prevent any damage to existing buildings, streets, curbs, paving, service utility lines, structures and adjoining property.

B. Locate and mark underground utilities to remain in service before beginning the work. Protect all existing utilities to remain in service during operations. Do not interrupt existing utilities except when authorized in writing by authorities having jurisdiction.

C. When an active utility line is exposed during construction its location and elevation shall be plotted on the Record Drawings by the Contractor and both the Architect and the Utility Owner notified in writing.

D. Inactive or abandoned utilities encountered during construction operations shall be removed, plugged, capped or filled. The location of such utilities shall be noted on Record Drawings and reported in writing to the Owner.

E. Provide barricades, fences, lights, signs, and all other safety devices required for the protection of the public.

F. In case of any damage or injury caused in the performance of work the Contractor shall, at his own expense make good such damage or injury to the satisfaction of, and without cost to, the Owner. Existing streets, sidewalks and curbs damaged during the project work shall be repaired or replaced to their condition prior to commencement of earthwork operations.

1. 8 SUBMITTALS

A. Issue submittals in accordance with Division 1. Submittals under this Section shall include manufacturer's specifications, samples and installation instructions

1.9 EARTH SUPPORT SYSTEMS

A. The Contractor shall provide temporary excavation support where open cuts made in accordance with OSHA requirements are not feasible. The system shall be installed as a matter as means and methods to protect adjacent structures, roadways, utilities, property, personnel and the public during the construction period in accordance with all Local, State and Federal requirements. The type of systems shall be determined by the Contractor's designer and all design and installation, removal and monitoring shall be included in the Contract price.

B. All earth support systems shall be designed and stamped by a Professional Engineer Registered in the Commonwealth of Massachusetts employed by the Contractor. The design shall be submitted to the Architect not less than 10 days prior to commencement of field installation activities for information only. The Architect will not review and or approve the submittal. The earth support design shall be complete and include drawings indicating the extent of earth support in plan and section, design calculations, material specifications and a complete construction sequence. The Contractor's design shall consider all soil pressures, hydrostatic pressures, adjacent structure surcharge loads, applicable traffic, construction equipment, stockpiles, surcharge loads and criteria to monitor the system. All intermediate stages of loading as well as final conditions shall be considered. The design shall also consider whether the system will be removed or remain in place. The designer shall be available throughout construction to provide additional technical assistance and approve of the installation and instrumentation monitoring.

C. Submitting the Contractor's plans, design calculations and methods of construction by the Architect shall not relieve the Contractor of the responsibility for the adequacy of the excavation lateral support system, preventing damage to structures, utilities and streets adjacent to excavations, and the safety of persons working within excavated areas and the public at large.

D. The excavation support system shall be installed utilizing methods that will not produce excessive noise or vibration in the area surrounding the site. During the installation of the excavation support system the Contractor shall monitor the resulting vibrations utilizing a seismograph located near the existing adjacent properties. Suitable threshold criteria shall be established by the system designer as part of the submittal. Should these threshold criteria be reached, the Contractor shall modify his installation means and methods as required by the system designer. The Contractor shall be responsible for all property damage sustained by abutting property owners resulting from the construction operations.

E. These criteria are intended to establish a minimum basis for the Contractor's design and procedures and in no way, relieve the Contractor of his sole responsibility for preventing detrimental movements and damage to adjacent structures, utilities or other work.

1.10 SITE DEWATERING

A. The Contractor shall be responsible for providing all site dewatering and groundwater control without limitation necessary for constructing the project as specified herein and shown on the Drawings. The dewatering and groundwater control system shall be designed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts and experienced in groundwater control methods. Such plan shall be delivered to the Architect at least 10 days prior to making the excavation on site for information only.

B. In general, all groundwater control systems shall prevent subgrade disturbance and provide a dry excavation.

C. The dewatering or groundwater control system shall be in operation 24-hours per day, 7-days per week until such time that it is no longer required to prevent flotation, subgrade disturbance or other damaging occurrences. The Contractor shall keep on hand at all times sufficient back-up power or systems to ensure the continuity of the groundwater control system.

D. Damage or difficult construction conditions resulting from inadequate dewatering or groundwater control shall be remedied immediately by the Contractor without additional compensation and to the satisfaction of the Architect.

E. The Contractor shall verify that the construction and / or operation of his dewatering system will not adversely affect any well, pond, stream, structure, utility, etc., on or adjacent to the area being dewatered.

F. All water shall be discharged into an adequate discharge system acceptable to the Architect and as required by the Town of North Andover and meeting all Town and State requirements.

1.11 TESTING

A. The Owner may retain a Geotechnical Engineer and / or Testing Agency to perform on-site observation and testing during the construction operations. The Contractor shall coordinate the individual's required presence on the site with the Architect and the construction activities. The services of the Engineer and / or Agency might include the following:

1. Field testing to assess degree of compaction.

2. Laboratory testing and analysis of fill materials specified, as required.

3. Assessment of foundation subgrade.

B. The Geotechnical Engineer's or Agency's presence does not include supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the Geotechnical Engineer or Agency nor any observations and testing performed by their representatives, nor any notice or failure to give notice, shall excuse the Contractor from defects discovered in the Work.

C. The Contractor shall provide a 50-pound sample of each fill material from each proposed source of supply. The Contractor shall include the name of the source and identify the specification item for which the material is proposed. Allow sufficient time for testing and evaluation of results before materials are needed. Once a source of supply for a specific material has been accepted for use on the project, the Contractor will bear the cost of testing for any additional materials submitted for the same use. This also includes the event where the gradation of the material within the source changes.

D. Architect will be sole and final judge of suitability of all material.

E. The Testing Agency will determine the maximum modified dry density and optimum water content of fill materials in accordance with ASTM D1557, Method D, and the in-place density in accordance with ASTM D1556 or ASTM D6938.

F. Tests of materials as delivered may be made from time to time. Materials in question shall not be used pending test results. The Contractor shall remove and legally dispose of off-site all rejected materials and replace with new, whether in stockpiles or in-place.

G. The Contractor shall bear the cost of testing materials that fail to conform to the Specifications.

1.12 MEASUREMENT AND PAYMENT

A. All excavated material is unclassified general excavation and shall be removed and legally disposed of as required.

B. If any part of the excavation is carried through error beyond the depth directed by the Architect and the dimensions indicated on the Drawings, or called for in the specifications, the Contractor, at his own expense shall furnish and install compacted gravel fill or concrete as directed by the Architect up to the required level and/or dimensions.

C. All excavation and backfilling shall be included in the Contract Price.

D. Foundation and Slab Payment limits as described in Section 3.1 K-M

E. The Contractor’s registered engineer or land surveyor shall prepare a survey and calculate, in sufficient detail, the volume of material removed for payment / credit purposes. The Architect reserves the right to accept or reject the Contractor’s calculation for earthwork volume. If the Architect rejects the total volume submitted, the Architect may have an independent registered surveyor or engineer repeat the volume calculation.

F. All survey and calculations shall be part of the Contractor’s scope of work and bid price. No additional compensation will be allowed.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. Fill materials where required shall conform to the following material descriptions. Gradation requirements shall be determined by ASTM D422 unless specified otherwise.

B. All material shall be well graded between the gradation limits shown.

C. Material termed “recycled”, “reprocessed”, or the like containing ground building debris, bituminous pavement or other similar non-soil materials or material coming from sources other than natural sand or gravel borrow pits free of hazardous residue shall not be used on this project within the building footprint.

D. On-site material shall not be reused for backfill except with the specific authorization of the Architect and provided that it meets the applicable specified requirements for its intended use.

E. Structural Fill / Gravel Borrow for fill below footings, within the building footprint or as required by the Architect shall consist of inert natural non-recycled material that is hard, durable stone, gravel and coarse sand, free from loam and clay, surface coatings, and deleterious materials. The material shall be well graded between the following limits:

U.S. Sieve No.	Percent Finer by Weight
3"	100
1/2"	50-85
No. 4	40-75
No. 10	30-60
No. 40	10-35
No. 100	5-20
No. 200	2-10

F. Granular fill where shown on the Drawings or as general site fill shall consist of inert natural non-recycled material that is hard, durable stone, gravel and coarse sand, free from loam and clay, surface coatings, and deleterious materials. Where freely draining material is required for backfill adjacent to basement or retaining walls limit the percent finer to 8 percent maximum. The material shall be well graded between the following limits:

U.S. Sieve No.	Percent Finer by Weight
2” size	100
No. 10	30-95
No. 40	10-70
No. 200	0-15

G. Crushed stone for drainage pipe protection, drainage, slab base course or as otherwise required by the Architect, shall consist of inert angular material derived from a stone quarry that is hard, durable, washed stone, free of deleterious materials. Gradation shall conform to MHD Specification Designation, M2.01.4, and the following:

U.S. Sieve No.	Percent Finer by Weight

1"	100
3/4"	90-100
1/2"	10-50
3/8"	0-20
No. 4	0-5

H. Ordinary (Common) borrow shall be well graded, natural inorganic soil, meeting the following requirements:

1. It shall be free of organic or other weak or compressible materials, of frozen materials, and stones larger than six inches maximum dimension and not more than 35 percent passing the number 200 sieve.

2. It shall be of such nature and character that it can be placed in embankments and compacted to the specified density in a reasonable length of time.

3. It shall be free from highly plastic clays, from all materials subject to decay, decomposition, or dissolution and from cinders or other materials that will corrode piping or other metal.

4. It shall have a maximum dry density of not less than 110 lbs. per cubic foot.

5. Material from excavation on the site may be used as ordinary borrow if it meets the above requirements and is approved by the Architect.

I. Sand for Pipe Bedding

1. Material for pipe bedding shall meet the requirements specified in ASTM C144 or as shown on the Drawings.

2.2 GEOTEXTILE FABRIC

A. Geotextile Fabric shall consist of Mirafi 140N or approved equal.

2.3 PERIMETER DRAINS

A. Perimeter drain pipe shall consist of four-inch or six-inch diameter perforated PVC drain pipe as shown on the drawings and normally used for underdrains. The pipe shall meet the requirements of Section M5.03.7 of the MHD Specifications. Perforated pipe shall have 2 rows of ½-inch diameter holes spaced on not more than 6-inch centers

2.4 EQUIPMENT

A. Compaction equipment shall consist of power-driven vibratory equipment and/or hand-guided mechanical tampers as approved by the Architect and capable of achieving the required degree of compaction in a reasonable length of time without damage to adjacent structures.

B. Provide sufficient numbers of equipment units of suitable types to spread, level, and compact fill promptly upon delivery of materials.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. The Drawings indicate, in general, alignments, grade elevations and invert elevations. Establish the lines and grades in conformity with the Drawings. The Architect, however, may make such adjustments in the field in grades and alignments as are found necessary in order to avoid interference with any special conditions encountered.

B. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas shall be given uniform slopes between points and existing established grades.

C. Establish and maintain suitable stakes over all areas to be graded as directed, specified or required. Maintain sufficient reference points at all times during construction to properly perform the contract installation.

D. Mucky, soft, loose or spongy soils or other material designated by the Architect shall be considered unsuitable for construction purposes and shall be removed from the site. Material rendered unsuitable by the Contractor's methods of construction shall not be defined as unsuitable soil for payment purposes.

E. The Contractor shall take all required measures to avoid disturbance of the subgrade particularly in consideration of the susceptibility of on-site soils to disturbance in the presence of surface water and groundwater.

F. Any excess excavation that has been carried, through error, beyond specified depths or dimensions shall be backfilled by the Contractor at his own expense with compacted gravel, with concrete, or with other material as directed by the Architect.

G. No excavation material shall be deposited or stockpiled at any time to endanger portions of new or existing structures, either by direct pressure or indirectly by overloading banks contiguous to the operation. Material, if stockpiled, shall be stored so as not to interfere with the established sequence of the construction. If there is not sufficient area available for stockpiling within the limits of the project, the Contractor will be required to furnish his own area for stockpiling.

H. When the plans require excavation in areas in close proximity to existing buildings, roads, structures and utilities it shall be the responsibility of the Contractor at his expense to use satisfactory means and methods to protect and maintain the stability of such roads, and structures located immediately adjacent to but outside the limits of excavation.

I. Do not excavate to full depth for footings in freezing weather unless concrete or backfill can be placed immediately. Following the placement of concrete footings, soil beneath footings shall be adequately protected from frost.

J. All soil bearing surfaces shall be carefully hand-cleaned of all loose soil. The final cut to expose foundation bearing surfaces consisting of soil shall be made utilizing a smooth-edged excavating bucket or a bucket with teeth placed horizontally to prevent disturbance of the bearing surface and retamped using suitable vibratory equipment to ensure a firm, compact bearing surface. All disturbed bearing surfaces shall be repaired and recompacted to the specified density.

K. Rock bearing surfaces shall have all loose and/or displaced rock fragments removed and shall be leveled to a maximum slope of 1 vertical to 12 horizontal across the footing area. Cleaning shall be done with high pressure air jets, water jets, brooms or by any other method acceptable to the Engineer. All additional dental concrete required to replace overbreak rock shall be provided by the Contractor at no additional cost to the Owner. Rock surfaces that are steeper than 1 vertical to 12 horizontal may require pinning if directed by the Architect or shown on the Drawings.

L. Individual and wall foundations shall bear entirely on soil or entirely on sound rock except within the transition zone described below. If the material below an individual footing is both soil and rock at subgrade, the footing shall bear entirely on sound rock by over-excavating to sound rock below the entire footing. If rock is encountered within 12 inches below the footing subgrade, the rock shall be cut to provide a 12-inch minimum pad thickness of ¾-inch crushed stone between the footing and the rock or the material shall be over-excavated so that the footing bears entirely on rock. If a wall footing transitions from a soil bearing surface to a rock bearing surface, a transition zone shall be constructed below the footing as described. The transition zone shall consist of a 12-inch thick pad of ¾-inch crushed stone extending a minimum of 8 feet in both the rock bearing and soil bearing directions. The zone shall extend 12 inches beyond both edges of the footing. The stone shall be thoroughly compacted into tight interlock using suitable vibratory equipment.

M. Rock shall be removed at least 6 inches below slabs but not less than the full depths of the slab base course whichever is greater. Rock shall be removed within utility excavations to the dimensions required to install the utility bedding and backfill.

N. All rock excavation shall be by using mechanical methods. Blasting is not allowed.

O. The bottom of footing grade for exterior footings bearing on sound, unfractured rock shall not be less than 2-1/2 feet below exterior finish grade. Where fractured rock exists at exterior footing locations, carry the excavation to a depth of 4 feet below exterior grade or to the depth where sound, unfractured rock is encountered but not less than 2-1/2 feet below exterior grade.

3.2 GENERAL EXCAVATION

A. All materials required to be excavated to permit construction of the proposed building and associated site improvements shall be included in the Contract Price as stated in the Measurement and Payment Section.

B. General excavation shall consist of excavating all unsuitable material within the building footprint. Unsuitable material defined in Section 1.3.A.3 shall be removed to the surface of the underlying natural soil or bedrock material, whichever occurs first, and to a lateral distance of at least 5 feet beyond the exterior perimeter of the building or to the lateral extent defined by a line extending down on a 1:1 slope from the exterior edge of the footing to the bottom of the cut, whichever is greater.

C. Work of cutting and filling shall be scheduled to efficiently use all acceptable excavated materials as directed by the Architect. If necessary, such materials shall be temporarily stockpiled between excavation and filling operations. The Architect shall approve locations for stockpiles.

D. Temporary ditches shall be made as needed to drain off surface water to avoid damage to areas of cut or fill. Such ditches shall be maintained as required for efficient operation, at no additional cost to the Owner.

E. When excavations have reached the required depths, the Architect shall be notified and will inspect the conditions. After inspection, the Contractor will receive approval to proceed if conditions meet design requirements.

F. No excavation will be permitted below a line drawn downwards at 2 horizontal to 1 vertical from the underside of the closest edge of any in-place footing or utility at a higher elevation without providing adequate sheeting and bracing as defined above to prevent all movement of the in-place footing or utility.

G. Removal of existing paving, sidewalk, and curb shall be for the full depth thereof and shall include any base courses. The Contractor shall use power saws or other suitable tools, equipment, and methods for cutting and trimming, that will remove the materials to the neat lines as shown on the Drawings, or as directed by the Architect, with a minimum damage to pavement, sidewalk, and curbs that are to remain. Damage done at these locations shall be repaired and restored by the Contractor at his expense.

H. The ground adjacent to all excavation shall be graded or shall have a bituminous concrete berm to prevent surface water from running into the excavation. Keep excavations free from water. No claims for additional cost will be allowed for pumping and draining required for excavations.

3.3 TRENCH EXCAVATION

A. Excavate as necessary for all drainage pipes, utilities and related structures and appurtenances, and for any other trenching necessary to complete the work.

B. Definitions:

1. Trench shall be defined as an excavation of any length where the width is less than twice the depth and where the shortest distance between payment lines does not exceed ten (10') feet. All other excavations shall be defined as open excavations.

2. The words "invert" or "invert elevation" as used herein shall be defined as the elevation at the inside bottom surface of the pipe or channel.

3. The words "bottom of the pipe" as used herein shall be defined as the base of the pipe at its outer surface.

C. In general, machine excavation of trenches will be permitted except for the preparation of pipe beds which will be hand work. Excavate by hand or machine methods to at least six (6") inches below the bottom of pipe or as shown on the Drawings. Excavation to final grade shall be made in such a manner as to maintain the undisturbed bearing character of the soils exposed at the excavation level.

D. Utilities or piping shall not be laid directly on boulders, cobbles or other hard material. This material shall be removed to a minimum of six inches below the bottom of pipe at all points and backfilled or compacted as specified.

E. In general, the width of trenches shall be kept to a minimum and in the case of piping shall not exceed the sum of the pipe's outside diameter plus 2'0" to at least twelve (12") inches above the pipe.

3.7 SHORING AND SHEETING AND PROTECTION OF EXCAVTIONS

A. Cut slopes for all excavations, shoring and bracing of trenches and other excavations shall be in accordance with the latest requirements of OSHA.

3.8 PROOF-ROLLING

A. All areas to receive fill or support footings including areas supporting slabs shall be proof-rolled or re-compacted prior to placing fill or constructing the footings as indicated below unless otherwise directed by the Architect.

B. Proof-rolling foundation subgrade in trenches shall be accomplished by making at least 5 passes over the area using a vibratory plate compactor. In open areas, proof-rolling shall be accomplished by a heavy vibratory drum compactor making at least 4 complete passes over the area. Vary procedure to maintain the integrity of the subgrade.

C. Soil that exhibits soft, weaving or other instability as determined by the Architect shall be removed and replaced with compacted Gravel Borrow or Crushed Stone at no additional cost to the Owner.

3.9 FILLING, BACKFILLING AND COMPACTION

A. Provide material conforming to these specifications and referenced Standards for all additional required fill at no additional cost to the Owner if sufficient quality or quantity of suitable material is not available on site.

B. Finished grades not otherwise indicated shall be uniform levels or slopes between points where levels are given or between such points and existing finished grades.

C. All areas to be filled or backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place fill when materials or material below it are frozen. No fill material containing ice or frozen lumps shall be used.

D. Material shall be placed in evenly distributed horizontal layers over entire area, spread and compacted as specified.

1. Remove all debris, organic materials or otherwise unsuitable materials from areas to be backfilled or filled.

2. Deposit fill and backfill in successive layers having a loose lift thickness not more than 6-inches for hand operated equipment and 12-inches for heavy (10-ton) vibratory rollers. Each layer shall moistened to the degree necessary to achieve the

required compaction (generally plus/minus 2% of optimum moisture) and thoroughly compacted by vibratory roller, pneumatic tamper, or other approved methods.

3. Moisture-density determinations shall be performed on representative soil samples in accordance with ASTM D1557, Method D. Corrected values for maximum dry density and optimum moisture content shall be in accordance with ASTM D4718.

4. Field density tests shall be taken in accordance with ASTM D1556 or ASTM D6938. The following percentages of maximum dry densities shall be achieved for fill materials or prepared subgrades. The moisture content of the compacted soil shall be plus/minus 2 percent of the optimum moisture content.

   a. Under structures, footings, paved surfaces, drainage piping, utilities and other improvements:

1)	All fills	95%
2)	Top twelve inches of subgrades in cut	95%

   b. Within lawn and planting areas:

1)	All fill within eighteen inches of finished subgrade	92%
2)	All fill below 18 inches from finished grade	90%

E. Filling shall be done only after the area to be filled has been observed by the Architect. The Contractor shall notify the Architect when excavation is ready for formal inspection. All areas to receive fill shall be proofrolled by at least two passes of the compaction equipment to be utilized for controlled placement of compacted fill, or other approved equipment.

F. The Architect reserves the right to disapprove of compaction equipment being used for compacting if he deems the equipment in use to be unsuited or inadequate to compact materials to the specified densities within a reasonable length of time.

G. All fill is to be placed "in the dry" to which end, dewatering may be required. The Contractor shall dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed condition of the excavated subgrade.

H. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of day's operations. Prior to terminating the operations for the day, the final layer of fill, after compaction, shall be rolled with a steel-wheeled roller to eliminate ridges of soil left by compaction equipment.

I. Before filling against walls, the permanent structure must be completed and sufficiently aged to attain strength required to resist fill pressures without damage. Temporary bracing of the permanent structure walls will not be permitted. Correct any damage to structure caused by filling operations at no cost to the Owner. Place no stones over 4 inches in diameter closer than 18 inches to wall surfaces.

J. In the case of lawn and planting areas, compaction requirements for subgrades and fills shall be considered minimums and maximums within the density percentages called for, and any over-compaction of subgrades or fills which would be detrimental to lawn or planting

objectives shall be corrected by loosening subgrades or fills through tilling or other means and recompacting to specified compaction limits.

K. If fill is placed adjacent to a slope, then the slope shall be adequately benched to receive fill. All fill shall be placed in horizontal layers against the slope.

3.10 BACKFILLING OF TRENCHES AND STRUCTURES

A. All requirements for description, placement, compaction and spreading of fill materials as specified herein shall be applicable to backfilling operations.

B. Backfill materials as specified herein shall be used as bedding and backfill around drainage pipes, around structures and for other uses as illustrated on the Drawings.

C. Do not commence backfilling operations for trenches and structures until all piping, etc., has been installed, tested and approved, and the locations of all pipe and appurtenances have been recorded. Backfill carefully by hand around pipe to depth on one foot above top of pipe using material specified herein, and tamping firmly in layers not exceeding six inches, compacting with hand rammers or mechanical tampers.

D. Backfill materials as specified shall be placed to the full width of the trench as indicated on Drawings. After a pipe is bedded, the trench shall be filled to the centerline of the pipe with fill as specified except at the joint. After the joint is inspected, that portion shall be filled in. Material under and around the pipe shall be carefully and thoroughly compacted to the densities specified herein.

E. From the centerline of the pipe to a point twelve inches above the top of the pipe the backfill shall be placed by hand and compacted with mechanical tampers to not less than 95% of maximum density at optimum moisture content of the material. above this point, backfill may be placed by machine in layers six inches (6") deep and compacted to the densities specified herein. This backfill shall be extended as shown on the Detail Drawings. Backfill simultaneously all sides of pipe or structure.

3.11 DRAINAGE AND FROST PROTECTION

A. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of water in excavated areas and adjacent properties.

B. Should surface, rain or groundwater be encountered during the operations, the Contractor shall furnish and operate pumps and related equipment, including standby equipment, and all necessary piping to keep all excavations clear of water at all times and shall be responsible for any damage to the subgrade, completed work or adjacent properties from such water. All piping exposed above surface for this use shall be properly covered to allow traffic to pass without obstruction. Dispose of water through temporary pipelines or ditches with outfall to natural drainage courses. Prevent erosion and siltation of surrounding areas.

C. The presence of groundwater in soil will not constitute a condition for which an increase in the Contract price may be made. Under no circumstances place concrete fill, lay piping or install appurtenances in excavations containing free water.

D. Frost Protection: Do not excavate to full indicated depth when freezing temperatures may be expected, unless work can be completed to subgrade or piping can be installed and backfilled the same day. Protect the excavation from frost if placing of concrete or piping is delayed, as approved by Landscape Architect. Protect foundation soils from frost penetration after the footings have been cast.

E. The Contractor shall keep the area under this Contract clear and free of accumulation of snow, ice and frozen ground within the Limit of Contract lines as required to carry out the work at no additional cost to the Contract. The Contractor will be solely responsible for preventing frost penetration into the foundation soil below footings and slab for the duration of this Contract.

F. No work shall be installed on frozen ground.

3.12 ROUGH GRADING

A. Rough grading shall include the shaping, trimming, rolling, and refinishing of all surfaces of the subbase, shoulders, and earth slopes, and the preparation of grades as shown on the Drawings. The grading of shoulders and sloped areas may be done by machine methods. All ruts shall be eliminated. Traffic of men and equipment across soil subgrade areas shall be prohibited following excavation to the required lines and grades.

B. If, during the progress of the Work any pipe, drain or other construction is damaged due to operations under this Contract, the Contractor shall repair all damage at no additional cost to the Owner and restore damaged areas to their original conditions.

C. Do all other cutting, filling and grading to the lines and grades indicated on the Drawings. Grade evenly to within the dimensions required for grades shown on Drawings and as specified herein. No stones larger than four inches (4") in largest dimension shall be placed in upper six inches of fill. Fill shall be left in a compacted state at the end of the work day and sloped to drain.

D. The Contractor shall bring all areas to grades as shown on the Drawings and in the details. The Architect, however, may make such adjustments in grades and alignments as are found necessary to avoid special conditions encountered.

E. No rubbish of any description shall be allowed to enter fill material. Such material shall be removed from the site.

F. Wherever streets, lawns, or sidewalks or other items contained within or outside the Limit of Contract lines have been excavated in fulfilling the work required under this Contract, this Contractor shall furnish and install all materials necessary to bring finish surfaces level with the existing adjacent surfaces. All work shall be installed to match the existing conditions in accordance with the governing authority. Notify the proper authorities prior to restoring surfaces outside the Contract Limit Lines

.

G. Placed fill materials which become disturbed shall be regraded and recompacted. Fill materials which become contaminated shall be removed and replaced, as directed by the Architect.

3.13 DUST CONTROL

A. The Contractor shall employ all possible methods and/or materials to prevent the spread of dust. Chemical materials may not be used on subgrades of areas to be seeded or planted. Contractor shall provide dust control on a daily basis as required and when directed by the Architect.

3.14 REMOVAL OF SURPLUS AND UNSUITABLE MATERIALS AND CLEANUP

A. Surplus excavated materials not required to complete site construction and unsuitable excavated materials shall, unless directed otherwise by the Architect, become the property of the Contractor who shall remove and legally dispose of such materials from the site at no additional cost to the Owner.

B. At the end of all excavation, filling and grading operations and before acceptance of the work, the Contractor shall remove all debris, rubbish, etc., from the site. He shall dispose of them in a manner satisfactory to the Architect. The premises shall be left clean, presentable, and satisfactory.

3.15 DEFICIENCY OF FILL MATERIAL

A. Provide required additional acceptable fill material from off site borrow sources to complete the work if a sufficient quantity of suitable material is not available from the required excavation on the project site.

END OF SECTION