Construction Documents

Early Site Preparation at Woburn Fire Headquarters

Contract No. 20-IFB-17

Set Number

CONSTRUCTION DOCUMENTS
for the
EARLY SITE PREPARATION at
WOBURN FIRE HEADQUARTERS
WOBURN, MASSACHUSETTS

Date: 1 JULY 2020

ARCHITECT: DiNISCO DESIGN, INC.
99 Chauncy Street, Suite 901
Boston, MA 02111
(617) 426-2858

OWNER'S PROJECT MANAGER: MUNICIPAL BUILDING CONSULTANTS
200 Sutton Street
North Andover, MA 01845
(978) 686-5766

CIVIL ENGINEER: HORSLEY WITTEN GROUP, INC.
90 Route 6A, Unit 1
Sandwich, MA 02563
(508) 833-6600

LANDSCAPE ARCHITECT: BROWN SARDINA, INC.
24 Roland Street
Boston, MA 02129
(617) 482-4703

GEOTECHNICAL ENGINEER: GZA GEOENVIRONMENTAL, INC.
31 State Street, 8th Floor
Boston, MA 02109
(617) 963-1000

SITE SURVEYING HANCOCK ASSOCIATES, INC.
185 Centre Street
Danvers, MA 01923
(978) 777-3050

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Part A

Bidding Requirements
Contract Forms
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Section 00020
Invitation to Bid
City of Woburn, Massachusetts
Early Site Preparation – Woburn Fire Headquarters, 20-IFB-17

Sealed bids for "**City of Woburn Massachusetts, Early Site Preparation – Woburn Fire Department, 20-IFB-17"** will be accepted by the City of Woburn, acting through the Chief Procurement Officer, **Orazio DeLuca**. Sealed bids will be accepted at the Office of the Purchasing Department, City Hall, 10 Common Street, Woburn, Massachusetts 01801, until **12:00 P.M**. on **July 23, 2020** and at that time the bids shall be publicly opened and read aloud.

The work includes furnishing all labor, tools and equipment necessary for site work, including installation of siltation controls, stripping and removal of loam and subsoil, and backfilling with new material.

The solicitation may be downloaded via: www.cityofwoburn.com or at the Office of the Purchasing Agent, City Hall, 10 Common Street, Woburn, Massachusetts 01801, on and after **July 1, 2020**, between the hours of 9:00 A.M. and 4:30 P.M., Monday through Wednesday, 9:00 A.M. and 7:00 P.M on Thursday and 9:00 A.M. and 1:00 P.M on Friday.

Each bid must be accompanied by bid security in the form of certified check, cashier's check; treasurer's check or bid bond in an amount not less than 5 percent of the value of the bid. Bidders may not withdraw their bids for a period of 30 calendar days after the bid opening. **Bids must be submitted in triplicate, in a sealed envelope, clearly labeled "City of Woburn Massachusetts, Early Site Preparation – Woburn Fire Headquarters, 20-IFB-17" or they may be rejected.**

Attention of bidders is called particularly to the requirements as to conditions of employment to be observed and minimum rates to be paid under the contract as determined by the Department of Labor and Industries under the provisions of the Massachusetts General Laws.

The successful bidder will be required to furnish a **Performance Bond in an amount equal to 100 percent of the contract price, for the faithful performance of the Contract, and a Labor and Material Payment Bond, in an amount equal to 100% of the contract price**. The right is reserved to waive any informalities in or to reject any or all bids received, and to award the contract to any of the Contractors bidding on the work if, in the City's' opinion, the best interests of the City thereby will be promoted.

Complete instructions for the filing of bids are included in Section 00100 of the Contract Documents, Information for Bidders.

A pre bid conference will be held at 2:00PM on Thursday, July 9, 2020 meeting at the project site at Main Street and Forest Park Road, Woburn, MA.

CITY OF WOBURN, MASSACHUSETTS

Orazio DeLuca
Chief Procurement Officer

Section 00100
INFORMATION FOR BIDDERS
IFB-20-17
Early Site Preparation – Woburn Fire Headquarters

1. RECEIPT AND OPENING OF BIDS

The City of Woburn, Massachusetts, herein called the Awarding Authority, will receive sealed Bids for Construction of the work to be done under this Contract, including the following, all as indicated on the Contract Drawings and specified herein:

A. Furnish all labor, materials, tools and equipment for the project as specified on the attached drawings and specifications.

B. The construction of all incidentals to complete work as described above.

Such bids, addressed to the City of Woburn, and clearly marked **"IFB-20-17, Early Site Preparation – Woburn Fire Headquarters"** will be received at the Office of the Woburn Purchasing Agent, City Hall, 10 Common St., Woburn, Massachusetts 01801, until the date and time stated in the Invitation to Bid,

2. BID FORM

A. Each Bid shall be submitted on the required Forms for General Bids. These forms shall be removed and submitted separately. All blank spaces for bid prices must be filled in with the lump sum for which the Bid is being submitted. **Three copies of the bid forms must be submitted.**

B. Bid forms must be completed in ink or by typewriter. Where so indicated, amounts shall be stated in words and figures. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

C. A bid security in the amount of 5% of the bid shall accompany each bid. The bid security may be in the form of certified check, cashier's check; treasurer's check or bid bond.

3. AVAILABILITY OF DOCUMENTS

A. Bid Forms and Contract Documents will be available for download via: www.cityofwoburn.com.

4. ALTERNATES

Where Alternates exist in the bid, each Bidder shall acknowledge Alternates on the Form for General Bid by entering the dollar amount of addition or subtraction necessitated by the Alternate. In the event an Alternate does not involve a change in the amount of the base bid, the Bidder shall so indicate by writing "No Change', or "N.C." or "0" or otherwise clearly indicating that there is no change in the Base Bid in the space provided that Alternate.

5. COMPARISON OF BIDS

A. In the event of a discrepancy between written and numerical figures in extended prices, the written figures shall govern.

6. WITHDRAWAL OF BIDS

A. Any bid may be withdrawn prior to the time designated for receipt of bids upon written request. Withdrawal of bids must be received over the Bidder's signature prior to the date and time set for receipt of bids.

B. Bidders may not withdraw or modify their bids for a period of 60 days, Saturday, Sunday and legal holidays excluded, following the opening of the bids.

7. ADDENDA AND INTERPRETATIONS

All questions by prospective bidders as to the interpretations of the Information for Bidders, bid forms, form of contract, general and supplementary conditions, drawings, specifications or bonds, must be submitted in writing to the Office of the Woburn Purchasing Agent, City Hall, 10 Common St, Woburn, Massachusetts 01810, at least seven (7) days before the date herein set for the opening of bids. An interpretation of all questions so raised which, in the Architect's opinion requires interpretation, will be mailed by certified mail with return receipt requested to prospective bidders at the addresses given by them not later than seven (7) days before the date of opening of bids. No other form of communication in this regard will be considered legal and binding. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under this bid as submitted. All addenda so issued shall be covered in the Bid and shall become part of the Contract Documents.

8. DELETIONS FROM CONTRACT

Not Used

9. EXAMINATION

By submitting a bid, the bidder warrants that it has examined the site of the work, the specifications and drawings and is fully acquainted with all conditions and restrictions pertaining to the work and the execution thereof. No claim for any extra work or extension of time will be allowed for failure to observe this requirement. Conditional bids will not be accepted.

10. CONTRACT TIME

All work of the Contract, excluding maintenance of erosion controls and final payment only, shall be completed by **November 30, 2020**. The Owner wishes to proceed with this project as soon as practical. Refer to SECTION 011000-Summary of Work.

11. ABILITY AND EXPERIENCE

A. The Owner will not award a contract to any bidder who cannot furnish satisfactory evidence of their ability and experience in this type of work and that they have sufficient plant and capital to enable them to prosecute and complete the work within the given time period.

B. The Owner may make such investigations as it deems necessary to determine the above and a bidder shall furnish any information requested in this regard and shall furnish same under oath if required.

12. INSURANCE CERTIFICATES

The Contractor will not be permitted to start any construction work until they have submitted certificates of insurance acceptable to the Awarding Authority and Owner. Certificates shall be submitted at the time of execution of the contract. Refer to Special Supplementary Conditions for details regarding the insurance requirements under this contract.

13. RIGHTS OF THE OWNER

A. The Owner may reject, as informal, bids that are incomplete, conditional, or obscure, or that contain additions or erasures that are not initialed or other irregularities.

B. The Owner reserves the right to reject any or all bids or to accept any bid as their interests may appear.

C. The Owner anticipates awarding a contract for this project within ten (10) days of the date of bid opening; however, this date is subject to change. Bidders shall be prepared to submit within five (5) working days all documents and information required for full execution of the Contract Agreement. If the Contractor fails to do so, the Owner reserves the right to rescind the Contract Award.

14. EXECUTION OF THE AGREEMENT

A. Within five (5) days of the receipt of the Agreement signed by the successful bidder, the Owner shall sign the Agreement and return a duplicate of the executed Agreement.

B. The Notice to Proceed shall be issued within five (5) days of the execution of the Agreement. This time period may be extended by mutual agreement between the Owner Authority and the Contractor.

15. MINIMUM WAGE RATES

Construction associated with this contract is governed by the Federal Davis-Bacon Act and the Massachusetts Prevailing Wage law. Refer to SECTION 018300-Minimum Wage Rates.

16. SAFETY AND HEALTH REGULATIONS

A. The successful bidder shall comply with the Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 (PC-91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL-91-54).

B. The successful bidder shall have a competent person or persons, as required under Occupational Safety and Health Act, on the Site to inspect the work and to supervise the conformance of the work with the regulations of the Act.

C. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926. Contractors shall be familiar with the requirements of these regulations. Contractors must provide copies of OSHA certification cards for all employees to be utilized for this project.

17. NON-DISCRIMINATION IN EMPLOYMENT

A. Contracts for work under this proposal shall obligate the Contractor and any Subcontractors not to discriminate in employment practices.

B. Bidders for the General Contract must submit with their initial bid a signed statement as to whether they have previously performed work subject to the President's Executive Order No. 11246, or any preceding similar Executive Order.

C. Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the contract.

D. Bidders must, if requested, submit a list of all subcontractors who will perform work on the project and submit written signed statements from authorized agents of the labor pools with which they will or may deal for employees on the work, together with supporting information to the effect that said labor pools' practices and policies are in conformity with Executive Order 11246, and that said labor pools will affirmatively cooperate in or offer no hindrance to the recruitment, employment, and equal treatment of employees seeking employment and performing work under the Contract, or certification as to what efforts have been made to secure such statement when such agents or labor pools have failed to furnish same prior to the Award of the Contract.

18. ACCESS TO THE SITE

Representatives of the City of Woburn and of the Commonwealth of Massachusetts shall have access to the work wherever it is in preparation or progress and the successful Bidder shall provide proper facilities for such access and inspection.

19. "OR EQUAL" CLAUSE

A. Whenever the specifications define the material or article required by using the name of the proprietary product or of a manufacturer or vendor rather than by using descriptive detail of substance and function, the words "or equal" are to be understood to follow immediately the name of the maker, vendor, or proprietary product. The words, "or equal" shall be interpreted as including any material or article which, in the opinion of the Architect, is equal in quality, durability, appearance, strength and design to the article named and which will perform adequately the functions imposed by the general design, in accordance with M.G.L. Ch30, & 39M(b).

B. Whenever in the specifications the names of manufacturers are mentioned as indicating that their products will comply with a particular specification, or when specific trade names or plate numbers or letters are mentioned, it is not intended to exclude products of other manufacturers whose names, trade names or symbols have not been mentioned, provided however, that such products otherwise comply, in the opinion of the Architect, with the specification. The Architect’s opinion in all cases mentioned in this section shall be final.

20. PROJECT GUARANTEE

A. The Contractor guarantees that the work and services to be performed under the Contract and all work, material, and equipment performed, furnished, used or installed in the construction of the same, shall be free from defects and flaws and shall be performed and furnished in strict accordance with the Drawings, Specifications, and other Contract Documents; that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one (1) year from and after the date of Substantial Completion and acceptance of the work. If part of the work is accepted by the Owner, the guarantee for that part of the work shall be for a period of one (1) year from the date fixed for such acceptance.

B. If at any time within said period of guarantee any part of the work requires repairing, correction or replacement, the Owner may notify the Contractor in writing to make the required repairs, correction or replacements. If the Contractor neglects to commence making such repairs, corrections or replacements to the satisfaction of the Owner within three (3) days from the date of receipt of such notice, or having commenced fails to prosecute such work with diligence, the Owner may employ other persons to make the same, and all direct and indirect costs of making said repairs, corrections or replacements, including compensation for additional professional services, shall be paid by the Contractor.

C. It is hereby, however, agreed and understood that this guarantee shall not include any repairs or replacements made necessary by any cause or causes other than improper, inadequate, or defective work, quality of the work, materials or design by the Contractor or those employed directly or indirectly by the Contractor.

21. INFORMATION NOT GUARANTEED

A. All information given on the Drawings or in the other Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources available to the Owner. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

B. It is agreed and understood that the Owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated on the Drawings or in the other Contract Documents.

C. It is agreed further and understood that no bidder or contractor shall use or be entitled to use any of the information made available to them or obtained in any examination made by them in any manner as a basis of or ground for any claim or demand against the Owner or the Architect, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other conditions, natural phenomena, existing pipes or other structures actually encountered during the construction work, except as may be otherwise expressly provided for in the Contract Documents.

22. LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable Federal Laws, State Laws and municipal ordinances related to the construction of the project shall apply to the contract throughout, as though herein written out in full.

23. METHOD OF AWARD - LOWEST RESPONSIBLE AND ELIGIBLE BIDDER

A. The Contract will be awarded on the basis of the lowest bid of the Base Bid submitted by a responsible and eligible bidder if such bid does not exceed the amount of funds available to finance the Contract.

B. If the amount of available funds exceeds the lowest bid of the Base Bid, the Contract will be awarded on the basis of the total bid for the Base Bid plus Alternates, to the extent that there are available funds. The Owner may select no or all Alternates, or any combination of Alternates in descending numerical order, to the extent that there are available funds. The Contract will be awarded on this basis to the lowest Qualified Bidder of the Base Bid and Alternates selected (if any).

24. SEVERABILITY

If any provisions of this Agreement or portion of such provision of the application thereof to any persons, entity, or circumstances is held invalid, the remainder of the Agreement (or remainder of such provision) and the application of such to other persons, entities, or circumstances shall not be affected thereby so long as such remaining or modified provisions reflect the intent of the parties.

25. POWER OF ATTORNEY

Attorneys-in-fact who sign contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

26. NOTICE OF REQUIREMENTS RELATING TO SUBCONTRACTOR

Bidders are specifically advised that the following conditions apply to any person for, or other party to whom it is proposed to award a subcontract under this contract:

A. The Subcontractor must be acceptable to the Owner and is subject to verification by the Owner of its eligibility to perform work under this contract.

Section 00300
STATEMENT OF BIDDER'S QUALIFICATIONS
And Bid Forms

1.01 BIDDERS AFFIDAVIT

All questions must be answered, and the data given must be clear and comprehensive. This statement must be notarized. If necessary, Questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder.

2. Permanent main office address

3. When organized?

4. If a corporation, where incorporated?

5. How many years have you been engaged in the contracting business under your present firm or trade name?

6. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)

7. General character of work performed by your company.

8. Have you ever failed to complete any work awarded to you? If so, where and why?

9. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed.

10. Experience in construction work similar in importance to this project.

11. List your major equipment <u>available for this contract.</u>

12. Resumes showing background and experience of the principal members of your organization, including officers, project manager and superintendent proposed for this project.

13. Credit available: $_____.

14. Give bank references: _____.

15. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner or the Engineer in verification or recitals comprising this Statement of Bidder's Qualifications.

Dated at _____this_____ day of

_____, 20_____.

_____

By: _____

Title: _____

State of _____)

) ss

County of _____)

_____ being duly sworn, deposes

and say that he is _____of_____

_____ and that the answers to the foregoing questions and all statements

therein contained are true and correct.

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

_____

Notary Public

My commission expires _____, 20____.

1.02 BID BOND

PROJECT: **IFB-20-17 Early Site Preparation – Woburn Fire Headquarters**

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

as PRINCIPAL, AND _____

and SURETY, are held and firmly bound unto the _____

called the OWNER in the penal sum in the amount of 5% of the bid amount of _____ ($_____),
lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying bid, dated _____, 20___, for _____.

NOW THEREFORE, if Principal shall not withdraw said bids within the period specified therein after the opening of the same, or, if not period be specified, within sixty (60) days after the said opening, and shall within the period specified therefore, or if not period specified, within five (5) days after the prescribed forms are presented to him for signature, enter into a written Contract with the OWNER in accordance with the Bid as accepted and give bond with good and sufficient surety or sureties, as may be required for the faithful performance and proper fulfillment of such Contract; or in the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, if the Principal shall pay the OWNER the difference between the amount specified in said Bid and the amount of with the OWNER may procure the required work or supplies for both, in the latter be in excess of the former, then the above obligation shall be voice and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bonded parities have executed this instrument under there several seals this _____day of _____, 20___, the name and corporate seal of each corporate party being thereto affixed and presented duly signed by this undersigned representative, pursuant to authority of its governing body.

In presence of:

_____ (SEAL)
(Individual Principal)

Business Address _____

Partnership _____ (SEAL)

Business Address _____

Attest: By _____(Corp. Principal)

Business Address _____

By _____

Attest: By _____ (Affix Corp. Seal)

Attest: By _____ (Corp. Surety)

_____

By _____

Countersigned
By

_____
Attorney-in-Fact,
State of _____

1.03 CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____

_____

Secretary of the Corporation names as Principal in the within bond; that _____, who signed and said bond on behalf of the Principal was then _____ of said corporation; and that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed, and attested to for and in behalf of said corporation by authority of this governing body.

_____ (Corporate Seal)

Title

_____PROJECT

IDENTIFICATION: **IFB-20-17 Early Site Preparation – Woburn Fire Headquarters**

THIS BID IS SUBMITTED TO: **Orazio DeLuca, Chief Procurement Officer**
Woburn City Hall
10 Common Street
Woburn, MA 01801
(781) 897-5950

1. The undersigned BIDDER proposes and agrees, if the BID is accepted, to enter into an Agreement with OWNER to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract time indicated in this Bid and in accordance with the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Instructions to Bidders. This Bid will remain open for sixty days after the day of Bid opening. BIDDER will sign the Agreement and submit the Contract Surety and other documents required by the Contract Documents within fifteen days after the date of the OWNER'S Notice of Award.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

   3.1 BIDDER has examined copies of all the Contract Documents and of the following addenda:

   Date Number

   (receipt of all of which is hereby acknowledged) and also copies of the Notice to Bidders and the Instructions to Bidders.

3.2 BIDDER has examined the site and locality where the Work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations) and the conditions affecting cost, progress of performance of the Work and has made such independent investigations as BIDDER deems necessary.

3.3 This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation, and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for himself any advantage over any other Bidder or over OWNER.

4. BIDDER will complete the Work for the prices shown in the attached Bid Forms.

5. BIDDER agrees that the work will be substantially completed on or before **November 30, 2020**.

6. The following documents are attached to and made a condition of the Bid:

6.1 A tabulation of Subcontractors and other persons or organizations required to be identified in this Bid.

6.2 Required Bidders Qualification Statement with supporting data (if requested by the Owner or the Engineer.

7. Communication concerning this Bid shall be addressed to:

Orazio DeLuca, Chief Procurement Officer
Woburn City Hall
10 Common Street
Woburn, MA 01801
(781) 897-5950
odeluca@woburnma.gov

8. The terms used in this Bid which are defined in the General Conditions of the Construction. Contract, included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.

SUBMITTED on _____, 20____

The BIDDER is:
An Individual

By _____ (SEAL)
(Individual's Name)

Doing business as _____

Business address: _____

_____

_____

Telephone No.: _____

A Corporation

By _____
(Corporation Name)

_____
(State of Incorporation)

By _____
(Name of person authorized to sign)

(Corporation Seal) _____
Attest

_____
(Secretary)

Business Address: _____

_____

_____

Telephone No.: _____

A Joint Venture

By _____
(Name)

_____
(Address)

By _____
(Name)

_____
(Address)

By _____
(Name)

_____
(Address)

(Each joint venture must sign. The manner of signing for each individual, partnership, and corporation that id party to the joint venture should be in the manner indicated above.)

IFB-20-17 Early Site Preparation – Woburn Fire Headquarters

CHECKLIST OF ITEMS TO BE SUBMITTED WITH BID

- ☐ Form for General Bid
- ☐ Certification as to Corporate Vote
- ☐ Non-Collusion Affidavit
- ☐ Certification of Payment of State Taxes
- ☐ Bid bond
- ☐ Bidders Affidavit

FORM FOR GENERAL BID

IFB-20-17 Early Site Preparation – Woburn Fire Headquarters

BID FORM

Bid of _____(herein after called the "Bidder), a _____corporation /a partnership /an individual (strike out inapplicable terms) doing business as

_____.

To City of Woburn (hereinafter called the "City"):

The undersigned hereby declares to have carefully examined the Contract Invitation to Bid, Information for Bidders, form of Contract and General, Supplementary, and Special Conditions, Specifications and Contract Drawings referred to and also the site upon which the proposed work is to be performed.

A. The undersigned also hereby declares that the winning Bidder is the only person interested in the bid: that it is made without any connection with any person making any bid for the same work; that no person acting for, or employed by the City of Woburn is directly or indirectly interested in this Bid, or in any contract which may be made under it, or in expected profits to arise there from: that it is bona fide and made without directly or indirectly influencing or attempting to influence any other person or corporation to bid or to refrain from bidding or to influence the amount of the bid of any other person or corporation, and without collusion or fraud with any other person or connection with any other person bidding for the same work; and that this Bid is made with distinct reference and relation to the plans and specifications prepared for this contract and herein mentioned. The undersigned declares that in regard to the conditions affecting the work to be done and the labor and materials needed, this Bid is based solely on its own investigation and research and not in the reliance upon any representations of any employee, officer or agent of the City. As used herein, the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal identity.

B. No oral, written or telegraphic amendments to this Bid will be accepted. A bidder wishing to amend this Bid after transmittal to the City may do so only by amending this Bid itself prior to the time for opening the bids.

C. The undersigned propose to furnish all labor, equipment and material required for the **IFB-20-17 Early Site Preparation – Woburn Fire Headquarters,** located in Woburn, Massachusetts, in accordance with the accompanying Contract Documents, Plans and Specifications prepared by DiNisco Design Partnership, Ltd. within the time set forth herein for the Contract Price specified below, subject to additions and deductions according to the terms of the Contract Documents. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this Bid is a part.

This Bid includes the Addenda numbered _____.

D. The proposed CONTRACT PRICE is _____

_____ DOLLARS ($_____)

FOR ALTERNATE NO. 1, ADD $_____ SUBTRACT $_____.

E. In submitting this Bid, the Bidder understands that the City reserves the right to reject any or all of the bids, and to waive any informalities in the bidding. The City further reserves the right to award the base bid contract and any or all of the alternates indicated above.

F. The Bidder agrees that this Bid shall be good and may not be withdrawn for a period of Sixty (60) calendar days after scheduled closing time for receiving bids.

G. Upon receipt of written notice of the acceptance of this bid, Bidder will execute a contract within 10 days.

H. The undersigned further certifies under the penalties of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under provisions of §29F of MGL c.29 or any other applicable debarment provisions of any chapter of federal or Massachusetts General Laws or any rule or regulation promulgated thereunder.

I. The undersigned further certifies that they are able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that they will comply fully with all laws and regulations applicable to awards made subject to Davis-Bacon regulations.

J. The undersigned agrees that all sub-contractors that perform work on this project will do so under a written agreement with the Contractor.

Respectfully submitted:

(Seal – if bid is by a corporation) _____

(Name of General Bidder

By_____

(Name of Person Signing Bid and Title)

_____

(Business Address

Federal ID# _____ _____

(Municipality and State)

CERTIFICATION AS TO CORPORATE VOTE

If a corporation, complete below or attach to each signed copy of the Contract a notarized copy of vote of corporation authorizing the signatory to sign this Contract.

At a duly authorized meeting of the Board of Directors of the

_____ held on _____
(Name of Corporation) (Date)

at which all the Directors were present or waived notice, it was VOTED, that,

_____ held on _____
(Name) (Officer)

of this company be and hereby is authorized to execute contract and bonds in the name and behalf of said company, and affix its corporate seal thereto; and such execution of any contract or obligation in this company's name on its behalf by such

_____ of the company, shall be valid
(Officer)

and binding upon this company.

A true copy,

ATTEST: _____
(Clerk)
Place of Business: _____

_____

I hereby certify that I am the Clerk of _____, that
(Name of Corporation)
_____ is the duly elected _____ of
(Name) (Officer)
said company, and that the above vote has not been amended or rescinded and remains in full force and effect as the date of this Contract.

(Corporate Seal)

NON-COLLUSION AFFIDAVIT

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

_____

Signature and Title

_____

Company Name

_____

Date

CERTIFICATION OF PAYMENT OF STATE TAXES

Pursuant to M.G.L. Chapter 62C, Sec. 49A, I certify under the penalties of perjury that I, to the best of my knowledge and belief, have filed all state tax returns and paid all state taxes required under law.

_____
Name of Company

_____
Social Security Number or
Federal Identification Number

_____
Signature and Title

_____
Date

Section 00500
AGREEMENT
OWNER-CONTRACTOR AGREEMENT
FOR PUBLIC WORKS CONSTRUCTION

THIS AGREEMENT made this _____ day of _____ in the year **2020**, between
_____, with a usual place of business at _____, hereinafter called the CONTRACTOR, and the **City of Woburn**, a duly organized municipal corporation acting by its Mayor, with a usual place of business at City Hall, 10 Common Street, Woburn, MA 01801-4139, hereinafter called the OWNER.

The CONTRACTOR and the OWNER, for the consideration hereinafter named, agree as follows:

1. Scope of Work

The Contractor shall furnish all labor, materials, equipment, and insurance to perform all work required for the project known as **"IFB-20-17 , Early Site Preparation – Woburn Fire Headquarters** Bid of _____, in strict accordance with the Contract Documents and all related Drawings and Specifications. The said Documents, Specifications, Drawings, and any GENERAL SUPPLEMENTARY CONDITIONS are incorporated herein by reference and are made a part of this Agreement.

2. Contract Price

The Owner shall pay the Contractor for the performance of this Agreement, subject to additions and deductions provided herein, in current funds, the sum of
$_____.

3. Commencement and Completion of Work

It is agreed that time is of the essence of this Agreement. The Contractor shall commence and prosecute the work under this Agreement upon execution hereof and shall substantially complete the work on or before **November 30, 2020.**

A. Definition of Term. The Term "Substantial completion" shall mean the date certified by the Owner when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy the project, or designated portion(s) thereof, for the use for which it is intended.

B. Time as Essential Condition. It is understood and agreed that the commencement of and substantial completion of the work are essential conditions of this Agreement. It is further agreed that time is of the essence for each and every portion of the Contract Documents wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract Documents any additional time is allowed for the completion of any work, the new time fixed by such extension shall be of the essence of this Agreement. It is understood and agreed that the times for the completion of the work are reasonable, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

C. Progress and Completion. Contractor shall commence work promptly upon execution of this Agreement and shall prosecute and complete the work regularly, diligently and uninterruptedly at such a rate of progress as will insure Substantial Completion within the stipulated number of calendar days.

4. Performance of the Work

A. Direction of the Work. The Contractor shall supervise and direct the Work, using his best skills and attention which shall not be less than such state of skill and attention generally rendered by the contracting profession for projects similar to the Project in scope, difficulty and location. The Contractor shall maintain adequate supervisory personnel at the project site during the performance of the Work. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Agreement.

B. Responsibility for the Work

a. The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor. This obligation shall also extend to the presence on the Site of suppliers of materials or equipment, their employees, contractors, and agents engaged in the work.

b. The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Owner in its administration of the Agreement, or by inspections, tests or approvals required or performed by persons other than the Contractor.

C. Permits and Fees. Unless otherwise expressly provided, the Contractor shall secure and pay for all permits and fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Agreement and which are legally required at the time the bids are received, and the same shall at all times be the property of the Owner and shall be delivered to the Owner upon completion of the Project.

D. Notices, Compliance With Laws

a. The Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work. The Contractor shall provide the Owner with reproductions of all permits, licenses and receipts for any fees paid. The Owner represents that it has disclosed to the Contractor all orders and requirements known to the Owner of any public authority particular to this Agreement.

b. If the Contractor observes that any of the Contract Documents are at variance with applicable laws, statutes, codes and regulations in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be accomplished by appropriate modification.

c. If the Contractor performs any Work which he knows or should know is contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility therefor and shall bear all costs attributable thereto.

d. In the performance of the Work, the Contractor shall comply with all applicable federal, state and local laws and regulations including those relating to workplace and employee safety. The Contractor shall notify the Owner immediately of any conditions at the place of the work which violate said laws and regulations and shall take prompt action to correct and eliminate any such violations.

E. Project Superintendent. The Contractor shall employ a competent superintendent, reasonably acceptable to the Owner, and necessary assistants who shall be in attendance at the Project site at all times during the progress of the Work. The Contractor shall not remove and replace the superintendent unless acceptable to the Owner. The Contractor shall remove and replace the superintendent if requested to do so in writing by the Owner, and shall promptly replace him with a competent person reasonable acceptable to the Owner. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.

F. Progress Schedule. The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's information an estimated progress schedule for the Work. The progress schedule may be in bar graph form, and shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

G. Drawings, Specifications, and Submittals

a. The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders, and other Modifications, and "As-Built" Drawings and Specifications in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data, and Samples. These shall be delivered to the Owner upon completion of the Work.

b. By approving and submitting Shop Drawings, Product Data, and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

c. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner's approval of Shop Drawings, Product Data or Samples unless the Contractor has specifically informed the Owner in writing of such deviation at the time of submission and the Owner has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data, or Samples by the Owner's approval thereof.

d. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Owner on previous submittals.

e. No portion of the Work requiring submission of a Shop Drawing, Product Data, or Sample shall be commenced until the submittal has been approved by the Owner. All such portions of the Work shall be in accordance with approved submittals.

H. Protection of the Work and Owner's Property. The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this Agreement. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury. The Contractor shall clean the work area and restore it to its original condition upon completion of the work.

I. Quality of the Work. The Contractor shall perform the work in a good, workmanlike manner. The Contractor hereby guarantees that the entire work constructed by him under the Agreement will meet fully all requirements thereof as to quality of workmanship and materials. The Contractor hereby agrees to make at his own expense any repairs or replacements made necessary by defects in materials or workmanship supplied to him that become evident within one (1) year after the date of the final payment, and to restore to full compliance with the requirements set forth herein any part of the work constructed hereunder, which during said one (1) year period is found to be deficient with respect to any provisions of the Contract Documents. The Contractor also agrees to hold the Owner harmless from claims of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Owner. If the Contractor fails to make the repairs and replacements promptly, the Owner may do the work and the Contractor shall be liable to the Owner for the cost thereof.

J. Warranty. The Contractor guarantees to Owner that all materials incorporated into the work will be new unless otherwise specified or agreed. Prior to final payment, the Contractor shall deliver to the Owner all manufacturers' warranties, together with such endorsements or assignments as are necessary to ensure to the Owner the full rights and benefits of such warranties.

5. Affirmative Action/Equal Employment Opportunity

The Contractor is directed to comply with all applicable State Laws, Ordinances, Bylaws, and rules and regulations regarding affirmative action/equal employment opportunity requirements. Failure of the Contractor to comply with any such law, rule or regulation shall constitute grounds for the Owner to terminate the Agreement.

6. Site Information Not Guaranteed; Contractor's Investigation

All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of the Contractor and is not guaranteed.

It is agreed and understood that the Owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated in the Contract Documents.

Contractor has familiarized himself with the nature and extent of the Contract Documents, work, locality, and with all local conditions and federal, state, and local laws, rules, ordinances, and regulations that in any manner may affect costs, progress, or performance of the work. Contractor has made, or has caused to be made, examinations, investigations, and tests and studies of such reports and related data in addition to those referred to in the paragraph above as he deems necessary for the performance of the work at the Contract Price, within the Contract Time, and in accordance with the other Terms and Conditions of the Contract Documents; and no additional examinations, tests, investigations, reports, and similar data are or will be required by the Contractor for such purposes.

Contractor has correlated the results of all such observations, examinations, investigations, tests, reports, and data with the Contract Documents. Contractor has given the Owner written notice of all conflicts, errors, or discrepancies that he has discovered in the Contract Documents, and the resolution thereof by the Owner is acceptable to the Contractor.

It is further agreed and understood that the Contractor shall not use or be entitled to use any of the information made available to him or obtained in any examination made by him in any manner as a basis of or ground for any claim or demand against the Owner, arising from or by reason of any variance which may exist between the information made available and the actual subsurface conditions or other conditions or structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

7. Owner's Project Representation

Except as otherwise indicated in the Contract Documents, the Architect shall be a representative of the Owner and the Contractor shall direct all communications, questions and comments on the work and the performance thereof to the Architect.

A. The Architect will make periodic visits to the site to familiarize the City 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 Architect will not be required to make exhaustive or continuous on-site inspections to check the quality of 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 Architect will keep the City informed on the progress of the work, will endeavor to guard the City against defects and deficiencies in the work of contractors, and may condemn structural work as failing to conform to the Contract Documents. The Architect shall have authority to act on behalf of the City only to the extent expressly delegated by the City, which shall be shown to the Contractor.

B. In connection with the work, the Architect 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.

C. The Architect shall, within a reasonable time, make decisions on all claims of the City 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. The decision, in mattes relating to the project, shall be final, if within the terms of the Contract Documents.

D. If, however, the Architect 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 Architect 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 decisions is acceptable to the parties concerned.

8. Wage Rates

Prevailing Wage Rates as determined by the Commissioner of the Department of Labor and Workforce Development under the provisions of Massachusetts General Laws, Chapter 149, Section 26 to 27G, as amended apply to this project. It is the responsibility of the Contractor to provide the Town with certified payrolls and to comply with all requirements of the above-cited statute.

The schedule of prevailing wage rates are included in the Contract Documents.

9. Payments to the Contractor

A. The Owner shall make payment to the Contractor in accordance with the provisions of Sections 39F and 39G of Chapter 30 of the General Laws of the Commonwealth of Massachusetts. The Contractor shall submit requisitions for payment as required by said provisions and the directions of the Owner.

B. The Contractor's applications for payment shall be subject to approval by the Architect.

C. Changes in the Work. No changes in the work covered by the approved Contract Documents shall be made without prior written approval of the Owner. Refer to Article 12 of the General Conditions.

D. Claims for Additional Costs. If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Owner written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

10. Final Payment, Effect

The acceptance of final payment by the Contractor shall constitute a waiver of all claims by the Contractor arising under the Agreement.

11. Contract Documents

The Contract Documents consist of the following, together with this Agreement:

Invitation to Bid
Instructions to Bidders
This Contract Form
Bid Form
Performance Bond
Labor & Materials Payment Bond
Non-Collusion Certificate
Tax Compliance Certificate
Clerk's Certificate of Corporate Vote
Certificate of Insurance
General Conditions
Supplementary General Conditions
General Requirements
Specifications and Addenda
Schedule of Prevailing Wages

Refer to SECTION 00700 – General Conditions, Paragraph 1.1.1

12. Terms Required By Law

This Agreement shall be considered to include all terms required to be included in it by the Massachusetts General Laws, and all other laws, applicable to the work required under this Agreement as though such terms were set forth in full herein.

13. Indemnification

Refer to SECTION 00700-General Conditions, Paragraph 4.17.

14. Insurance

The Contractor shall purchase and maintain such insurance as will protect both the Owner and the Contractor from claims which may arise under the Agreement, including operations performed for the named insured by independent contractors and general inspection thereof by the named insured. In addition, the Contractor shall require its subcontractors to maintain such insurance. Coverage shall be provided for:

A. Claims under workers' or workmens' compensation, disability benefit and other applicable employee benefit acts;

B. Claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

C. Claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

D. Claims for damages insured by usual personal injury liability coverage which are sustained
(1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;

E. Claims for damages, including damages to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

F. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle; and

G. Claims involving contractual liability applicable to the Contractor's obligations under Article 13.

The limits of liability for coverage required under the preceding paragraph shall be as required by the Owner. Refer to SECTION 008000 – Supplemental General Conditions.

Except for Workmen's Compensation, all liability coverage shall name the City of Woburn as an **additional insured** and shall provide for **30 days prior written notice** to the City of any modification or termination of coverage provided thereby. The Contractor shall provide the Owner with appropriate certificate(s) of insurance evidencing compliance with this provision with the signed Agreement. The Owner reserves the right to request a copy of the polic(ies) to confirm coverage provided.

15. Notice

All notices required to be given hereunder shall be in writing and delivered to, or mailed first class to, the parties' respective addresses stated above. In the event that immediate notice is required, it may be given by telephone or facsimile, but shall, to the extent possible, be followed by notice in writing in the manner set forth above.

16. Termination

A. Each party shall have the right to terminate this Agreement in the event of a failure of the other party to comply with the terms of the Agreement. Such termination shall be effective upon seven days' notice to the party in default and the failure within that time of said party to cure its default.

B. The Owner shall have the right to terminate the Agreement without cause, upon ten (10) days' written notice to the Contractor. In the event that the Agreement is terminated pursuant to this subparagraph, the Contractor shall be reimbursed in accordance with the Contract Documents for all Work performed up to the termination date, and for all materials or equipment not incorporated in the Work, but delivered and suitably stored at the site. Payment for material or equipment stored at the site shall be conditioned upon submission by the Contractor of bills of sale or such other evidence as is satisfactory to Owner to establish the Owner's title to such material or equipment or otherwise protect the Owner's interests.

17. Miscellaneous

A. Royalties and Patents. The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified; but if the Contractor believes or has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner, and thereafter the Owner insists on the use of the design, process or products specified.

B. Assignment. The Contractor shall not assign or transfer any of its rights, duties or obligations under this Agreement without the written approval of the Owner.

C. Governing Law. This Agreement shall be governed by and construed in accordance with the law of the Commonwealth of Massachusetts.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals, the Owner by its authorized representatives who, however, incur no personal liability by reason of the execution hereof or of anything herein contained, as of the day and year first above written.

CITY OF WOBURN, MASSACHUSETTS
INC.
OWNER

_____,
CONTRACTOR

By:_____

Name:_____

Title:_____

_____
Scott D. Galvin, Mayor

Approved as to Legal Form:

_____
City Solicitor

In accordance with M.G.L. c. 44, Section 31C, this is to certify that an appropriation in the amount of this contract is available therefor and that the Mayor is authorized to execute the contract and approve all requisitions and change orders:

_____
Charles E. Doherty, City Auditor

_____
Orazio DeLuca, Chief Procurement Officer

Account # _____

Section 00550
CHANGE ORDER FORM

Date: _____

Project: Early Site Preparation – Woburn Fire Headquarters

Change Order No. _____

Contractor: _____

Contract Amount (As Bid): _____

Amount of Previous Change Orders: _____

Net Change in Contract Price
(this Change Order): _____

Total Adjusted Contract Price
(including this Change Order): _____

This Change Order extends the time to complete the work by _____ calendar days.

The extended completion date _____

Reason for Contract Change:

This Change Order is approved by:

Architect Date

The undersigned agree to the terms of the Change Order:

Contractor Date

Mayor Scott D. Galvin, City of Woburn Date

Certification of Appropriation under M.G.L. c.44, s.31C: An appropriation in an amount to cover the total costs of this change order was made:

By: _____ _____
City Auditor Date

Approved as to Legal Form

By: _____ _____
City Solicitor Date

Approved by Purchasing Department

By: _____ _____
City Purchasing Agent Date

Section 00610

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we _____
(Name of Contractor)

a _____ hereinafter called “Principal” and
(Corporation, Partnership, Joint Venture or Individual)

_____of _____, State of _____
(Surety) (City)

_____ hereinafter called the "Surety" and licensed by the State Division of Insurance to do business under the laws of the Commonwealth of Massachusetts, are held and firmly bound to the City of Woburn, Massachusetts, hereinafter called "Owner", in the penal sum of _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal has entered into a certain contract with the Owner (the “Construction Contract”), dated the _____ day of _____, 20___, for the construction described as follows:

IFB-20-17 Early Site Preparation – Woburn Fire Headquarters

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

PROVIDED, FURTHER, that the Surety’s obligation under this Bond shall arise after (1) the Owner has declared the Principal in default of the Construction Contract or (2) has declared that the Principal has failed, or is otherwise unable or unwilling, to execute the work consistent with, and in conformance to, the Construction Contract (collectively referred to as a “Contractor Default”). The determination of a Contractor Default shall be made solely by the Owner.

When the Surety's obligation under this Bond arises, the Surety, at its sole expense and at the consent and election of the Owner, shall immediately take one of following steps: (1) arrange for the Principal to perform and complete the work of the Construction Contract; (2) arrange for a contractor other than the Principal to perform and complete the work of the Construction Contract; (3) reimburse the Owner, in a manner and at such time as the Owner shall decide, for all costs and expenses incurred by the Owner in performing and completing the work of the Construction Contract.

If the Surety does not proceed as provided in this Bond with due diligence and all deliberate speed, the Surety shall be deemed to be in default of this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner.

After the Surety's obligation under this Bond arises, the Surety is obligated, to the limit of the amounts of this Bond, for (1) the correction of defective work and completion of the Construction Contract; (2) additional design, professional services, and legal costs, including attorney's fees, resulting from the Contractor Default or from the default of the Surety under this Bond; (3) any additional work beyond the Construction Contract made necessary by the Contractor Default or default of the Surety under this Bond; and (4) liquidated damages as provided in the Construction Contract, or if none are so specified, actual and foreseeable consequential damages resulting from the Contractor Default or default of the Surety under this Bond.

Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction in the Commonwealth of Massachusetts.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Construction Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Construction Contract or to the work or to the specifications.

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

ATTEST:

_____
Principal

_____ By _____
(Principal Secretary)

_____

(SEAL) _____

_____
(Address-Zip Code)

_____
Witness as to Principal

_____

_____
(Address-Zip Code)

ATTEST:

_____
Surety

_____ By _____
(Attorney-in-Fact)

_____

(SEAL)

_____
(Address-Zip Code)

_____
Witness as to Surety

_____

_____
(Address-Zip Code)

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

Section 00620

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we
_____, a
_____
(Name of Contractor) (Corporation, Partnership, Joint Venture or Individual)

hereinafter called "Principal" and _____
(Surety)

of _____, State of _____

hereinafter called the "Surety" and licensed by the State Division of Insurance to do business under the laws of the Commonwealth of Massachusetts, are held and firmly bound to the City of Woburn, Massachusetts, hereinafter called "Owner", in the penal sum of
_____ Dollars

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

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

IFB-20-17 Early Site Preparation – Woburn fire Headquarters

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

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

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

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20_____.

ATTEST:

_____
Principal

By_____
(Principal Secretary)

_____

_____

_____
(Address-Zip Code)

_____
Witness as to Principal

_____ (SEAL)

_____
(Address-Zip Code)

ATTEST:

_____
Surety

By_____
(Attorney-in-Fact)

_____

_____
(Address-Zip Code)

(SEAL)

_____
Witness as to Surety

_____

_____
(Address-Zip Code)

NOTE: If Contractor is a Partnership, all partners should execute Bond.

Section 00700

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

ARTICLE 1

CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Owner-Contractor Agreement, the Conditions of the Contract (General, Supplemental and other Conditions), the Drawings, the Specifications, all Addenda issued prior to and all Modifications issued after execution of the Contract, and all applicable laws, ordinances and regulations. A Modification is (1) a written amendment to the contract signed by both parties, (2) a Change Order, (3) a written interpretation issued by the Owner or (4) a written order for a minor change in the Work issued by the Owner pursuant to Paragraph 12.3. The Contract Documents include Bidding Documents such as the Advertisement or Invitation to Bid, the Instructions to Bidders, sample forms, the Contractor's Bid or portions of Addenda relating to any of these, or any other documents, specifically enumerated in the Owner-Contractor Agreement.

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1.

1.1.3 THE WORK

The Work comprises the completed construction required by the Contract Documents and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

1.1.4 THE PROJECT

The project is the total construction of which the Work performed under the Contract Documents may be the whole or a part.

1.1.5 "OR EQUAL"

The use of the words "Or Equal" following the name of any manufacturer, vendor or proprietary product shall be understood to mean that articles or materials may be substituted which, in the opinion of the Owner, are equal in quality, durability, appearance, strength, design and performance to the articles or materials named or described and will perform adequately in providing a first-class facility, as defined by M.G.L. c. 30, s.39M (b).

When submitting shop drawing information on articles or materials which are being proposed as substitutes for specified items, the Contractor shall clearly identify them as such. If the articles or materials are accepted as equal to those on which dimensions on the drawings are based, any dimensional variance from those shown and/or specified shall be shown on the shop drawings prepared by the Contractor, illustrating the manner in which conformity to dimensions and design is to be obtained. All such drawings shall be subject to the approval of the Owner and the installation of the article shall not proceed without first obtaining said approval.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 The Contract Documents shall be signed in not less than quadruplicate by the Owner and Contractor.

1.2.2 By executing the Contract, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.

1.2.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

1.2.4 The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

1.3 OWNERSHIP AND USE OF DOCUMENTS

1.3.1 All Drawings, Specifications and copies thereof furnished by the Owner are and shall remain the Owner's property. They are to be used only with respect to this Project and are not to be used on any other project without the prior written consent of the Owner. With the exception of one contract set for each party to the Contract, such documents are to be returned or suitably accounted for to the Owner at the completion of the Work. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of any reserved rights.

ARTICLE 2

2.1 ADMINISTRATION OF THE CONTRACT

2.1.1 The designated representative of the Owner or its Architect will visit the site at intervals appropriate to the stage of construction to familiarize himself 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. However, the Owner's Representative will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work.

2.1.2 The Owner shall at all times have access to the Work wherever it is in preparation and progress. The Contractor shall provide facilities for such access so the Owner may perform its functions under the Contract Documents.

2.1.3 Based on the Owner's observations and an evaluation of the Contractor's Applications for Payment, the Owner will determine the amounts owing to the Contractor and will issue Certificates for Payment in such amounts, as provided in Paragraph 9.4.

2.1.4 The Owner will render information necessary for the proper execution or progress of the Work within twenty (20) days of any request by the contractor or in accordance with any time limit agreed upon.

2.1.5 The Owner will have authority to reject Work which does not conform to the Contract Documents. Whenever, in his opinion, he considers it necessary or advisable for the implementation of the intent of the Contract Documents, he will have authority to require special inspection or testing of the Work in accordance with Subparagraph 7.7.2 whether or not such Work be then fabricated, installed or completed. Any such rejection of work shall not relieve the Contractor of the responsibility for maintaining protection of the Work and the Owner's property.

2.1.6 The Owner or its Representative will review and approve or take other appropriate action upon Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Owner's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

2.1.7 The Owner will prepare Change Orders in accordance with Article 12, and will have authority to order minor changes in the Work as provided in Subparagraph 12.4.1.

2.1.8 The Owner will conduct inspections to determine the date of Substantial Completion and Final Completion, will review written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of Paragraph 9.9.

ARTICLE 3

OWNER

3.1 DEFINITION

3.1.1 The Owner is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means the Owner or his authorized agent / representative.

3.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

3.2.1 The Owner shall, at the time of execution of the Agreement and any subsequent Change Orders, certify for the Contractor that financial arrangements have been made to fulfill the Owner's obligations under the Contract.

3.2.2 The Owner shall furnish all surveys describing the physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site.

3.2.3 Except as provided in Subparagraph 4.7.1. Owner shall secure and pay for necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

3.2.4 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the Work.

3.2.5 The Owner will furnish the Contractor with six copies of all Drawings and Specifications and revisions issued during the progress of the Work; all additional copies will be furnished upon request at the cost of reproduction.

3.2.6 The Owner, through its designated agent / Representative, shall forward all instructions directly to the Contractor.

3.2.7 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Work by Owner or by Separate Contractors, Payments and Completion, and Insurance in Articles 6, 9 and 11 respectively.

3.3 OWNER'S RIGHT TO STOP THE WORK

3.3.1 If the Contractor fails to correct defective Work as required by Paragraph 13.2 or fails to carry out the Work in accordance with the Contract Documents or if the Owner shall for any other reason so require, the Owner, by a written order signed personally or by an agent specifically so empowered by the Owner in writing, may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated or until further written notice from the Owner; however, this right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3. The Contractor shall resume the Work after such stoppage promptly upon written notice to do so from the Owner. If such stoppage is required through no fault of the Contractor, the Contract Time (and the dates for achieving Substantial Completion and Final Completion) shall be extended by a period equal to the period of the stoppage, and the Contractor shall be compensated for its reasonable and justifiable costs incurred as a result of such stoppage.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

3.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within seven days after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to any other remedy he may have, perform such work or cause such work to be performed and/or make good such deficiencies. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for additional services made necessary by such default, neglect or failure. If the payments then or thereafter due the Contractor are not sufficient to cover the amount, the Contractor shall pay the difference to the Owner.

ARTICLE 4

CONTRACTOR

4.1 DEFINITION

4.1.1 The Contractor is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

4.2 REVIEW OF CONTRACT DOCUMENTS

4.2.1 The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Owner any error, inconsistency or omission he may discover. The Contractor shall not be liable to the Owner for any damage resulting from errors, inconsistencies or omissions in the Contract Documents which he discovers but shall be liable for damage to the extent he reasonably should have but failed to discover such errors, inconsistencies or omissions. The Contractor shall perform no portion of the Work at any time without Contract

Documents or, where required, approved Shop Drawings, Product Data or Samples for such portion of the Work.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention which shall not be less than such state of skill and attention generally rendered by the contracting profession for projects similar to the Project in scope, difficulty and location. The Contractor shall maintain adequate supervisory personnel at the Premises during the performance of the Work. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor. This obligation shall also extend to the presence on the Site of suppliers of materials or equipment, their employees, contractors, and agents engaged in the work.

4.3.3 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Owner in its administration of the Contract, or by inspection, tests or approvals required or performed under Paragraph 7.7 by persons other than the Contractor.

4.4 LABOR AND MATERIALS

4.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and service necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

4.4.2 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him including all persons on the Site controlled directly or indirectly by the Contractor.

4.5 WARRANTY

4.5.1 The Contractor warrants to the Owner that all materials and equipment furnished under this Contract will be new and of recent manufacture unless otherwise permitted in writing by the Owner and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and, promptly after written notification of non-conformance, shall be repaired or replaced by the Contractor with Work conforming to such requirements. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Paragraph 13.2.

4.5.2 Refer to SECTION 00100, Article 20, Project Guarantee.

4.6 TAXES

4.6.1 The Contractor shall pay all applicable sales, consumer, use and other similar taxes for the Work or portion thereof provided by the Contractor which are legally enacted at the time bids are received, whether or not yet effective.

4.7 PERMITS, FEES AND NOTICES

4.7.1 Unless otherwise expressly provided in the SECTION 011000-Summary of Work, the Contractor shall secure and pay for all permits and fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required at the time the bids are received, and the same shall at all times be the property of the Owner and shall be delivered to the Owner upon completion of the Project.

4.7.2 The Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work. The Contractor shall provide the Owner with reproductions of all permits, licenses and receipts for any fees paid. The Owner represents that it has disclosed to the Contractor all orders and requirements known to the Owner of any public authority particular to this Contract.

4.7.3 If the Contractor observes that any of the Contract Documents are at variance with applicable laws, statutes, codes and regulations in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be accomplished by appropriate Modification.

4.7.4 If the Contractor performs any Work which he knows or should know is contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility therefor and shall bear all costs attributable thereto.

4.8 SUPERINTENDENT

4.8.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.

4.9 PROGRESS SCHEDULE

4.9.1 The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's information an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

4.10 DOCUMENTS AND SAMPLES AT THE SITE

4.10.1 The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, and "As-Built" Drawings and Specifications in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be available to the Owner upon completion of the Work.

4.11 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

4.11.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

4.11.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.

4.11.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

4.11.4 The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents.

4.11.5 By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

4.11.6 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner's approval of Shop Drawings, Product Data or Samples or the Architect's approval of the same unless the Contractor has specifically informed the Owner or Architect in writing of such deviation at the time of submission and the Owner or Architect has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility from errors or omissions in the Shop Drawings, Product Data or Samples by the Owner's approval thereof.

4.11.7 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Owner or its Architect on previous submittals.

4.11.8 No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Owner or Architect. All such portions of the Work shall be in accordance with approved submittals.

4.12 USE OF SITE

4.12.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with any materials or equipment.

4.13 CUTTING AND PATCHING OF WORK

4.13.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work or to make its several parts fit together properly.

4.13.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any separate contractor except with the written consent of the Owner and of such separate contractor. The Contractor shall not unreasonably withhold from the Owner or any separate contractor his consent to cutting or otherwise altering the Work.

4.14 CLEANING UP

4.14.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work he shall remove all his waste materials and rubbish from and about the Project in full compliance with all applicable laws and regulations as well as all his tools, construction equipment, machinery and surplus materials and the Project shall be thoroughly cleaned and ready for immediate occupancy by the Owner.

4.14.2 If the Contractor fails to clean up at the completion of the Work, the Owner may do so as provided in Paragraph 3.4 and the cost thereof shall be charged to the Contractor.

4.15 COMMUNICATIONS

4.15.1 The Owner shall designate the contact to which the contractor shall forward all comments pertaining to the project.

4.16 ROYALTIES AND PATENTS

4.16.1 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified, but if the Contractor believes or has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner, and thereafter the Owner insists on the use of the design, process or products specified.

4.17 INDEMNIFICATION

4.17.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Architect and the Owner's Project Manager (OPM) and their agents, consultants and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission 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, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph 4.17.

4.17.2 In any and all claims against the Owner the Architect 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 4.17 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 workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

4.17.3 The obligations of the Contractor under this paragraph 4.17 shall not extend to the liability of the Owner, the Architect, their agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) written directions or instructions given by the Owner, the Architect, their agents or employees, provided they are the sole cause of the injury or damage.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITION

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the Work at the site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representatives. The term Subcontractor does not include any separate contractor or his subcontractors.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the Work at the site. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Unless otherwise required by the Contract Documents or the Bidding Documents, the Contractor, as soon as practicable after the award of the Contract, shall furnish to the Owner in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The Owner will reply to the Contractor in writing within twenty (20) days stating whether or not the Owner, after due investigation, has reasonable objection to any such proposed person or entity.

5.2.2 The Contractor shall not contract with any such proposed person or entity to whom the Owner has made reasonable objection under the provisions of Subparagraph 5.2.1. The Contractor shall not be required to contract with anyone to whom he has a reasonable objection.

5.2.3 If the Owner has reasonable objection to any such proposed person or entity, the Contractor shall submit a substitute to whom the Owner has no reasonable objection.

5.2.4 The Contractor shall make no substitution for any Subcontractor, person or entity previously selected if the Owner makes reasonable objection to such substitution.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By an appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner. Said agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. The Contractor shall make availability to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph 5.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to his Sub-subcontractors. The Contractor shall be fully responsible to the Owner for the acts and omissions of all Subcontractors and other entities or persons directly or indirectly employed by him to perform the Work. If requested by the Owner, the form and substance of any Subcontract with the Contractor shall be subject to the prior written consent of the Owner, which consent shall not be unreasonably withheld or delayed.

ARTICLE 6

WORK BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to perform work related to the Project with his own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, he shall make such claim as provided elsewhere in the Contract Documents.

6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.1.3 The Owner will provide for the coordination of the work of his own forces and of each separate contractor with the Work of the Contractor, who shall cooperate therewith as provided in Paragraph 6.2.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate his Work with theirs as required by the Contract Documents.

6.2.2 If any part of the Contractor's Work depends for proper execution or results upon the work of the Owner or any separate contractor, the Contractor shall, prior to proceeding with the Work, promptly report to the Owner any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acceptance of the Owner's or separate contractors' work as fit and

proper to receive his Work, except as to defects which may subsequently become apparent in such work by others.

6.2.3 Any costs caused by defective or ill-timed work shall be borne by the party responsible therefor.

6.2.4 Should the Contractor cause damage to the work or property of the Owner, or to other work on the site, the Contractor shall promptly remedy such damage as provided in Subparagraph 10.2.5.

6.2.5 Should the Contractor wrongfully cause damage to the work or property of any separate contractor, the Contractor shall upon due notice promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues or initiates an arbitration proceeding against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor's expense, and if any judgment or award against the Owner arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorneys' fees and court or arbitrations costs which the Owner has incurred.

6.3 OWNER'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up as required by Paragraph 4.15, the Owner may clean up and charge the cost thereof to the contractors responsible therefor.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 The Contract shall be governed by the law of the Commonwealth of Massachusetts. All applicable provisions of Federal, state, or local laws, by-laws, rules, or regulations are incorporated into the Contract as if fully set forth herein, and shall prevail over any conflicting provisions of the General or Supplemental General Conditions.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The Owner and the Contractor each bind himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any moneys due or to become due to him hereunder, without the previous written consent of the Owner.

7.3 WRITTEN NOTICE

7.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to him who gives the notice. Written Notice to the Owner shall be delivered to the Mayor, City Hall, 10 Common Street, Woburn, MA 01801.

7.4 CLAIMS FOR DAMAGES

7.4.1 Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the other party or of any of his employees, agents or others for whose acts he is legally liable, claim shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage. The reasonable time shall not exceed fourteen days.

7.5 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.5.1 The Contractor shall furnish a Performance Bond in an amount at least equal to one hundred percent (100%) of the Contract price as security for the faithful performance of this Contract and also a Payment Bond in an amount not less than one hundred percent (100%) of the Contract price as security for the payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract. The Performance Bond and the Payment Bond may be in one or in separate instruments in accordance with local law, and in a form acceptable to the Owner, and shall remain in effect through the one-year warranty period.

7.6 RIGHTS AND REMEDIES

7.6.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law, except as otherwise set forth therein.

7.6.2 No action or failure to act by the Owner, the Architect or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

7.7 TESTS

7.7.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested or approved, the Contractor shall give the Owner and Architect timely notice of its readiness so the Owner and Architect may observe such inspection, testing or approval. The Contractor shall bear all costs of such inspections, tests or approvals conducted by public authorities which are normal and customary for the type of work required by the Contract. Unless otherwise provided, the Owner shall bear all costs of other inspections, tests or approvals, which shall include the

program of special testing and inspections required by the Massachusetts State Building code (780 CMR). All testing methods, organizations, and personnel shall be approved by the Owner or Engineer before the start of testing Work, without regard to what party will ultimately pay for such Work.

7.7.2 If the Owner or Architect determines that any Work requires special inspection, testing, or approval which Subparagraph 7.7.1 does not include, it will instruct the Contractor to order such special inspection, testing or approval, and the Contractor shall give notice as provided in Subparagraph 7.7.1. If such special inspection or testing reveals a failure of the Work to comply with the requirements of the Contract Documents, the Contractor shall bear all costs thereof, including compensation for the Owner's additional services made necessary by such failure; otherwise the Owner shall bear such costs, and an appropriate Change Order shall be issued.

7.7.3 Required certificates of inspection, testing or approval shall be secured by the Contractor and promptly delivered by him to the Owner and Architect.

7.7.4 If the Owner or Architect is to observe the inspections, tests or approvals, he will do so promptly and, where practicable, at the source of supply.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Substantial and Final Completion of the Work as defined in Subparagraph 8.1.3, including authorized adjustments thereto. Time is of the essence with regard to completion of the Work required by the Contract.

8.1.2 The date of commencement of the Work is the date established in a notice to proceed. If there is no notice to proceed, it shall be the date of the Owner-Contractor Agreement or such other date as may be established therein.

8.1.3 The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Owner when construction is substantially complete, in accordance with the Contract Documents, other than only punch list items, the lack of or completion of which will not interfere with the Owner's use, so the Owner can lawfully occupy and utilize the Work or designated portion thereof for the use for which it is intended. The Date of Final Completion of the Work is the date on which the Owner issues its final Certificate for Payment in accordance with Paragraph 9.9.1 hereof.

8.1.4 The term day as used in the Contract Documents shall mean calendar day unless otherwise specifically designated.

8.2 PROGRESS AND COMPLETION

8.2.1 All time limits stated in the Contract Documents are of the essence of the Contract.

8.2.2 The Contractor shall begin the Work on the date of commencement as defined in Subparagraph 8.1.2. He shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time, and Final Completion thereafter in accordance with the provisions of the Contract Documents.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Owner or Engineer or by any employee of the Owner or Engineer, or by any separate contractor employed by the Owner or Architect, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonably anticipated, unavoidable casualties, or any causes beyond the Contractor's or its Subcontractor's control, or by delay authorized by the Owner, then, provided such delay in no way results from the act or neglect of the Contractor or any of its Subcontractors, the Contract Time shall be extended by Change Order for such reasonable time as the Owner may determine.

8.3.2 Any claim for extension of time shall be made in writing to the Owner not more than seven (7) days after the commencement of the delay; otherwise it shall be waived. In the case of a continuing delay only one claim is necessary. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the Work.

8.3.3 If no agreement is made stating the dates upon which interpretations shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretation until fifteen days after written request is made for them, and not then unless such claim is reasonable.

8.4 LIQUIDATED DAMAGES

8.4.1 If the Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay to the Owner the amount specified herein, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contract shall be in default after the time stipulated in the Contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

8.4.2 It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein as definite and certain length of times if fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract.

8.4.3 Provided, that the contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; Provided, further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

1. To any preference, priority or allocation order duly issued by the Government;
2. To unforeseeable cause beyond the control and without the fault of negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather; and
3. To any delays of subcontractors or suppliers occasioned by any of the causes specified in subsection (1.) and (2.) of this article:

8.4.4 Provided, further, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the Contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

8.4.5 Liquidated damages have been established at $500.00 per calendar day under any contract that results from this bid.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Owner-Contractor Agreement and, including authorized adjustments thereto, is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Owner a schedule of values allocated to the various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Owner may require. This schedule, unless objected to by the Owner, shall be used only as a basis for the Contractor's Application for Payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 The Contractor shall submit to the Owner an itemized Application for Payment supported by such data substantiating the Contractor's right to payment as provided elsewhere in the Contract Documents for the period ending the 25th day of each month within the Contract period.

9.3.2 Unless otherwise provided in the Contract Documents, payments will be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site and, if approved in advance by the Owner, payments may similarly be made for materials or equipment suitably stored at some other location agreed upon in writing. Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest, including applicable insurance and transportation to the site for those materials and equipment stored off the site. The Contractor shall assume responsibility to protect all such

materials from loss or damage at no cost to the Owner, until they are finally incorporated into the Work, whether or not they have been paid for by the Owner.

9.3.3 The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "liens"; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

9.4 CERTIFICATES OF PAYMENT

9.4.1 The Owner will, within ten days after the receipt of the Contractor's Application for Payment, issue a Certificate for Payment to the Contractor for such amount as the Owner determines is properly due, or notify the Contractor in writing his reasons for withholding a Certificate as provided in Subparagraph 9.6.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Owner, based on its observations at the site as provided in Subparagraph 3.2.7 and the data comprising the application for Payment, that the Work has progressed to the point indicated; that, to the best of his knowledge, information and belief, the quality of Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Document upon Substantial Completion, to the results of any subsequent tests required by or performed under the Contract Documents correctable prior to completion, and to any specific qualifications stated in his Certificate); and that the Contractor is entitled to payment in the amount certified. However, by issuing a Certificate for Payment, the Owner shall not thereby be deemed to represent that he has made exhaustive or continuous on-site inspections

to check the quality or quantity of the Work or that he has reviewed the construction means, methods, techniques, sequences or procedures, or that he has made any examination to ascertain how or for what purpose the Contractor has used the moneys previously paid on account of the Contract Sum.

9.5 PROGRESS PAYMENTS

9.5.1 After the Owner has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents. The Owner shall retain 5% general retainage from each progress payment, which retainage shall be released to the Contractor upon substantial completion, excepting amounts retained for unfinished work, punchlist, and/or closeout submissions.

9.5.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's Work. The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to his Sub-subcontractors in similar manner.

9.5.3 The Owner may, on request and at his discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by the Contractor and the action taken thereon by the Owner on account of Work done by such Subcontractor.

9.5.4 The Owner shall not have any obligation to pay or to see to the payment of any moneys to any Subcontractor except as may otherwise be required by law.

9.5.5 No Certificate for a progress payment, nor any progress payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.

9.6 PAYMENTS WITHHELD

9.6.1 The Owner shall decline to certify payment and withhold its Certificate in whole or in part, to the extent necessary reasonably to protect itself. If the Owner is unable to certify payment in the amount of the Application, he will notify the Contractor as provided in Subparagraph 9.4.1. If the Contractor and the Owner cannot agree on a revised amount, the Owner will promptly issue a Certificate for Payment for the amount for which it determines is properly due. The Owner may also decline to certify payment or, because of subsequently discovered evidence or subsequent observations, it may nullify the whole or any part of any Certificate for Payment previously issued, to such extent as may be necessary in its opinion to protect itself from loss because of:

1. Defective work not remedied,
2. Third party claims filed or reasonable evidence indicating probable filing of such claims,
3. Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment,
4. Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum,
5. Damage to the Owner or another Contractor,
6. Reasonable evidence that the Work will not be completed within the Contract Time, or material failure to carry out the Work in accordance with the Contract Documents.

9.6.2 When the above grounds in Subparagraph 9.6.1 are removed, payment shall be made for amounts withheld because of them.

9.7 FAILURE OF PAYMENT

9.7.1 If the Owner does not issue a Certificate for Payment, through no fault of the Contractor, within ten days after receipt of the Contractor's Application for Payment, then the Contractor may, upon ten additional days' written notice to the Owner, stop the Work until payment of the amount owing has been received. The Contract Sum shall be increased by the amount of the Contractor's reasonable and justifiable costs of shut-down, delay and start-up, which shall be effected by appropriate Change order in accordance with Paragraph 12.3.

9.8 SUBSTANTIAL COMPLETION

9.8.1 When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Subparagraph 8.1.3, the Contractor shall prepare for submission to the Owner a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. When the Owner on the basis of an inspection determines that the Work or designated portion thereof is substantially complete, he will then prepare for a Certificate of Substantial Completion which shall establish the Date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Warranties required by the Contract Documents shall commence on the Date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibility assigned to them in such Certificate.

9.8.2 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and Certification by the Owner, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof, as provided in the Contract Documents.

9.9 FINAL COMPLETION AND FINAL PAYMENT

9.9.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner will promptly make such inspection and, when it finds the Work acceptable under the Contract Documents and the Contract fully performed, it will promptly issue a final Certificate for Payment stating that to the best of its knowledge, information and belief, and on the basis of its observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor, and noted in said final Certificate, is due and payable. The Owner's final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Subparagraph 9.9.2 have been fulfilled.

9.9.2 Neither the final payment nor the remaining retained percentage shall become due until the Contractor submits to the Owner (1) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been fully paid or otherwise satisfied, (2) consent of surety, if any, to final payment and (3), if required by the Owner, other data establishing payment or satisfaction of all such obligations, such as the written document described in Paragraph 13.2.2, receipts, releases and waivers of liens arising out of the Contract, to the extent and in such form as may be designated by the Owner. If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against any such lien. If any such lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

9.9.3 If, after Substantial Completion of the Work, final completion thereof is delayed for more than ninety (90) days through no fault of the Contractor or by the issuance of Change Orders affecting final completion, the Owner shall, upon application by the Contractor, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted, provided that the remaining balance for Work not fully completed or corrected shall not be less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Paragraph 7.5, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Owner prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.9.4 The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

1. Unsettled liens,
2. Faulty or defective Work appearing after Substantial Completion,
3. Failure of the Work to comply with the requirements of the Contract Documents, or
4. Terms of any special warranties required by the Contract Documents.
5. Obligations under the Performance and Payment Bonds.

9.9.5 The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled prior to the time of the final Application for Payment.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

1. All employees on the Work and all other persons who may be affected thereby;

2. All 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 his Subcontractors or Sub-subcontractors; and

3. 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.

10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy all damage or loss to any property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible under Clauses 10.2.1.2 and 10.2.1.3, except damage or loss solely attributable to the acts or omissions of the Owner, the Architect or anyone directly or indirectly employed by the Owner or Architect, or by anyone for whose acts the Owner or Architect may be liable, and not attributable to the acts or omissions of the Owner, the Architect or anyone directly or indirectly employed by them, or by anyone for whose acts it may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to his obligation under Paragraph 4.13.

10.2.6 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner.

10.2.7 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

10.3 EMERGENCIES

10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 12 for Changes in the Work.

ARTICLE 11

INSURANCE

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall purchase and maintain such insurance as will protect him and the Owner 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 himself 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:

1. Claims under workers' or workmen's compensation, disability benefit and other similar employees benefit acts;

2. Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

4. Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;

5. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and

6. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater. Refer to Supplemental General Conditions.

11.1.3 The insurance required by Subparagraph 11.1.1 shall include contractual liability insurance applicable to the Contractor's obligations under Paragraph 4.18.

11.1.4 Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverages afforded under the policies will not be cancelled until at least thirty days prior written notice has been given to the Owner. Certificates of renewal shall be delivered to the Owner at least fifteen (15) days prior to the expiration date of any insurance policy. The Contractor shall not commence the Work until all insurance required hereunder shall have been obtained and approved by the Owner, and the Contractor shall not permit any Subcontractor or Sub-subcontractor to commence work until all insurance required of them shall have been similarly obtained and approved.

11.2 OWNER'S LIABILITY INSURANCE

11.2.1 The Owner, at its option, may purchase and maintain such insurance as will protect it against claims which may arise from operations under the Contract.

11.3 PROPERTY INSURANCE

11.3.1 The Owner does not intend to purchase or maintain property insurance for the Work. The Contractor may purchase property insurance which will protect the interests of himself his Subcontractors and the Sub-subcontractors in the Work, and that cost shall be included in the bid price. If not covered under the all risk insurance or otherwise provided in the Contract Documents, the Contractor shall effect and maintain property insurance on portions of the Work stored off the site or in transit when such portions of the work are to be included in an Application for payment Subparagraph 9.3.2. This insurance does not cover any tools owned by mechanics, any tools, equipment, scaffolding, staging towers, and other property owned or rented by the Contractor, the capital value of which is not included in the cost of the Work.

11.3.2 The Owner and Contractor waive all rights against (1) each other and the Subcontractors, Sub-subcontractors, agents and employees each of the other, and (2) separate contractors, if any, and their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to

this Paragraph 11.3 or any other property insurance held by the Owner as trustee. The Owner or the Contractor, as appropriate, shall require of separate contractors, Subcontractors and Sub-subcontractors by appropriate agreements, written where legally required for validity, similar waivers each in favor of all other parties enumerated in this Subparagraph 11.3.2.

11.3.3 The Owner as trustee shall have power to adjust and settle any loss with the insurers.

11.3.4 The construction site may be occupied by the Owner during the Work. Insurance shall not lapse or be cancelled on account of this occupancy. The insurance certificates required under this contract shall include this requirement.

11.4 LOSS OF USE INSURANCE

11.4.1 The Owner, at his option, may purchase and maintain such insurance as will insure him against loss of use of his property due to fire or other hazards, however caused.

ARTICLE 12

CHANGES IN THE WORK

12.1 CHANGE ORDER

12.1.1 A Change Order is a written order to the Contractor signed by the Owner, issued after execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

12.1.2 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and the Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents.

A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and the Architect and may or may not be agreed to by the Contractor. A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order. An order for a minor change in the work may be issued by the Architect alone.

1. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect 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.
2. A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

3. If the Contractor does not respond promptly or disagree with the method for adjustment in the Contract Sum, the method and adjustment shall be determined as set forth under Clause 12.1.4. 4. Pending final determination of cost to the Owner, amounts not in dispute may be included in Applications for Payment. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or submissions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

12.1.3 The cost or credit to the Owner resulting from a change in the Work shall be determined in one or more of the following ways:

1. By mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

2. By unit prices stated in the Contract Documents or subsequently agreed upon;

3. By cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

4. By the method provided in Subparagraph 12.1.4.

12.1.4 If none of the methods set forth in Clauses 12.1.3.1, 12.1.3.2 or 12.1.3.3 is agreed upon, the Contractor, provided he receives a written order signed by the Owner, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Owner on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Clauses 12.1.3.3 and 12.1.3.4 above, the Contractor shall keep and present an itemized accounting together with appropriate supporting data for inclusion in a Change Order. Unless otherwise provided in the Contract Documents, cost shall be limited to the following:

1. Labor, except Superintendent
2. Materials entering permanently into the work.
3. The reasonable cost at fair market rental rates for equipment employed directly on the work (hand tolls and minor equipment excluded).
4. Power and consumable supplies for the operation of power equipment.
5. Insurance.
6. Social Security and Old Age, Unemployment contributions and Workman's Compensation Insurance, not to exceed 30% of labor rate.
    a. "Percentage" shall mean an allowance to be added to or subtracted from the Cost in lieu of overhead and profit and of any other expense which is not included in the Cost of the Work covered by the change, as defined above. Percentage for a Sub-subcontractor shall be 10% of any net increase or decrease of Cost of any Work performed by the Sub-subcontractor's own forces plus 5% of any net increase or decrease in Cost of any Work performed for the Sub-subcontractor by lower tier Sub-subcontractors. Percentage for the Contractor shall be 10% of any net increase or decrease of Cost of any Work performed by the Contractor's

own forces plus 5% of any net increase or decrease in the Cost for all other Work covered by the change.

b. "Cost" may include wages and benefits of supervisory personnel only when either of the following conditions are fulfilled:

1) If there is an extension in the Substantial Completion date for circumstances beyond the control of the Contractor as a result of approved Change Orders, and only on those Change Orders which directly impact the time extension.

2) Accelerated performance without time extension in order to meet project requirements as determined by the Architect.

c. Notwithstanding the inclusion of unit prices in the Contract Documents, it shall be the Owner's option to require the Cost of any given change to be determined by one of the other methods stated in 12.1.4. If the Owner elects to determine the Cost of the change work by unit prices and the nature of the work is such that its extent cannot readily be measured after the completion of such work or any subsequent work, the Contractor shall keep daily records, available at all times to the Architect for inspection, of the actual quantities of such work put in place, and delivery receipts or other adequate evidence, acceptable to the Architect, indicating the quantities of materials delivered to the site for use in such unit price work, and distinguishing such from other similar material delivered for use in work included in the base Contract Sum. If so required by the Architect, materials for use in unit price work shall be stored apart from all other materials on the Project.

12.1.5 Unit prices specified in SECTION 012200 -UNIT PRICES shall include all costs of the Contractor to the Owner as listed in Paragraph 12.1.4. No additional charges shall be allowed for these items under any circumstances.

12.2 CONCEALED CONDITIONS

12.2.1 Should concealed conditions encountered in the performance of the Work below the surface of the ground or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the Contract Documents, or should unknown physical conditions below the surface of the ground or should concealed or unknown conditions in an existing structure of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in his Contract, be encountered, the Contract Sum shall be equitably adjusted by Change Order upon claim by either party made within twenty days after the first observance of the conditions.

12.3 CLAIMS FOR ADDITIONAL COST

12.3.1 If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Owner written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with Paragraph 10.3. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

12.3.2 If the Contractor claims that additional cost is involved because of, but not limited to, (1) any written interpretation by the Owner or Architect, (2) any order by the Owner to stop the Work pursuant to Paragraph 3.3 where the Contractor was not at fault, (3) any written order for a minor change in the Work issued pursuant to Paragraph 12.4, or (4) failure of payment by the Owner pursuant to Paragraph 9.7, the Contractor shall make such claim as provided in Subparagraph 12.3.1.

12.4 MINOR CHANGES IN THE WORK

12.4.1 The Owner and Architect will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be affected by written order, and shall be binding on the Owner, Architect and the Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 13

UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any portion of the work should be covered contrary to the request of the Owner or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Owner, be uncovered for his observation and shall be replaced at the Contractor's expense.

13.1.2 If any other portion of the Work has been covered which the Owner has not specifically requested to observe prior to being covered, the Owner may request to see such Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it be found that this condition was caused by the Owner or a separate contractor as provided in Article 6, in which event the Owner shall be responsible for the payment of such costs.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall promptly correct all Work rejected by the Owner as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Owner's additional services made necessary thereby.

13.2.2 The Contractor shall provide a document to the Owner certifying that if within one year after the Date of Substantial Completion of the Work or designated portion thereof or within one year after acceptance by the Owner of designated equipment or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or requiring excessive service or maintenance or not in accordance with the Contract Documents, the Contractor shall correct it within seven (7) days after receipt of a written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such approval, which written acceptance shall specifically refer to such defect. This obligation shall survive termination of the Contract. The Owner shall give such notice promptly after discovery of the condition. The provisions of this paragraph are in addition to, and not in limitation of, the Owner's other rights and remedies hereunder and in law and equity.

13.2.3 The Contractor shall remove from the site all portions of the Work which are defective or non-conforming and which have not been corrected under Subparagraph 4.5.1, 13.2.1 and 13.2.2, unless removal is waived by the Owner in writing.

13.2.4 If the Contractor fails to correct defective or nonconforming Work as provided in Subparagraphs 4.3.1, 12.2.1 and 13.2.2. The Owner may correct it in accordance with Paragraph 3.4.

13.2.5 If the Contractor does not proceed with the correction of such defective or non-conforming Work within a reasonable time fixed by written notice from the Owner, the Owner may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten days thereafter, the Owner may upon ten additional days' written notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Owner's additional services made necessary thereby. If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

13.2.6 The Contractor shall bear the cost of making good all work of the Owner or separate contractors destroyed or damaged by such correction or removal.

13.2.7 Nothing contained in this Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents, including Paragraph 4.5 hereof. The establishment of the time period of one year after the Date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his obligation other than specifically to correct the Work.

13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

13.3.1 If the Owner prefers to accept defective or nonconforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 14

TERMINATION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 If the Work is stopped for a period of ninety (90) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a decision of a national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, or if the Work should be stopped for a period of thirty days by the Contractor because the Owner has not issued a Certificate for Payment as provided in Paragraph 9.7 or because the Owner unjustifiably has not made payment thereon as provided in Paragraph 9.7, then the Contractor may, upon seven additional days written notice to the Owner, terminate the Contract and recover from the Owner payment for all Work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery, including reasonable profit and damages.

14.2 TERMINATION BY THE OWNER

14.2.1 To the extent permitted by law, if the Contractor is adjudged a bankrupt, or if he makes a general assignment for the benefit of his creditors, or if a receiver is appointed on account of his insolvency, or if he refuses or fails, repeatedly except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he fails to make prompt proper payment to Subcontractors for materials or labor, or disregards laws, ordinances, rules, regulations or order of any public authority having jurisdiction, or

otherwise fails to comply with any provision of the Contract Documents, then the Owner may, without prejudice to any right or remedy and after giving the Contractor and his surety, if any, seven days' written notice, 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 he may deem expedient.

14.2.2 If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including compensation for the Owner's additional services made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The obligation to pay said amount to the Contractor or to the Owner, as the case may be, shall survive the termination of the Contract.

ARTICLE 15

MEDIATION

15.1 Controversies and Claims Subject to Mediation

15.1.1 Mediation of all questions and issues in dispute resulting from this Contract shall be submitted to Mediation in accordance with the provisions of the standard form of Mediation of the American Arbitration Association, but only in the event that both parties to this Contract so agree to such submission to Mediation. If both parties fail to agree to submit to Mediation in the manner prescribed above, or to submit to Mediation in any mutually acceptable form, all questions and issues in dispute will be submitted to a court of competent jurisdiction of the Commonwealth of Massachusetts, to be tried according to the applicable laws of the Commonwealth of Massachusetts.

15.1.2 Compensation for the services of the mediator or arbitrator, as the case may be, will be borne equally by the parties, but each party shall bear its own expenses for the presentation of its own case.

SECTION 00800

SUPPLEMENTAL GENERAL CONDITIONS

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1. INTRODUCTION

The following supplements modify, change, delete from or add to Section 00700 GENERAL CONDITIONS. Where any Subsection of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplemental General Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

2. In accordance with General Laws Chapter 149, Section 26 through 27D, the Contractor is obligated to comply with the prevailing wage rates established by the Commission of the Department of Labor and Industries for mechanics, apprentices, chauffeurs, teamsters and laborers employed on the Project. The schedule of applicable prevailing wage rates for the Project are contained in Section 018300-MINIMUM WAGE RAGES.

3. The Insurance provisions of Article II of The General Conditions are amended by adding the following requirements:

The Contractor shall carry and continuously maintain until completion of the Contract, insurance as specified below and in such form as shall protect him performing work covered by this Contract, or the City of Woburn and its employees, agents and officials, from all claims and liability for damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this Contract. The Contractor covenants and agrees to hold the City and its employees, agents and officials harmless from loss or damage due to claims for personal injury and/or property damage arising from, or in connection with operations under this Contract.

Except as otherwise stated, the amounts of such insurance shall be for each policy, not less than:

(A) For liability for bodily injury, including accidental death, $1,000,000 for any one person and $1,000,000 on account of one occurrence and $1,000,000 Aggregate Limit.

(B) For liability for property damage $1,000,000 on account of any one occurrence and $1,000,000 Aggregate Limit. Extra-territorial clause shall be included.

1.) Worker's Compensation insurance as required by the General Laws of the Commonwealth of Massachusetts.

2.) Bodily Injury Premise-Operations, Contractor's Protective and Completed Operations Public Liability Insurance in the amounts required in (A) above.

3.) Property Damage Premises-Operations, Contractor's Protective and Completed Operations Public Liability Insurance in the amounts required in (B) above.

4.) Bodily Injury Liability Insurance covering the operation of all motor vehicles owned by the Contractor and vehicles not owned by the Contractor, while such vehicles are being operated in connection with the prosecution of the work under this Contract, in the amounts required in (A) above.

5.) Property Damage Liability Insurance covering the operation of all motor vehicles owned by the Contractor and vehicles not owned by the Contractor while such vehicles are being operated in connection with prosecution of the work under this Contract, in the amounts required in (B) above.

6.) Contractual Liability Insurance covering the liability assumed by the Contractor in the amounts required under (A) and (B) above.

7.) Owner's Protective Insurance secured by the Contractor on behalf of the City of Woburn which will directly protect the City and/or its employees, agents and officers from liability for bodily injuries, including accident death, in the amounts required in (A) above, and for property damage in the amounts required in (B) above.

8.) Umbrella / excess liability insurance: $5,000,000 per occurrence.

All policies shall be so written that the Owner will be notified of cancellation or restrictive amendment at least fifteen (15) days prior to the effective date of such cancellation or amendment. A certificate from the Contractor's Insurance Carrier showing at least the coverage and limits of liability specified above and expiration date shall be filed with the Owner before operations are begun.

Such certificates shall not merely name the types of policy provided, but shall specifically refer to this Contract and shall state that such insurance is required by this Contract. The Contractor shall make no claims against the City of Woburn or its officers for any injury to any of his officers or employees or for damage to his trucks or equipment arising out of work contemplated by this Contract.

4. Modified Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program.

The Contractor shall abide by the Commonwealth of Massachusetts' Modified Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program as well as with all other applicable Federal, State and Local equal employment opportunity, affirmative action, minority/women's business enterprise laws, rules, regulations and policies.

Section 00850

Excerpts from Chapter 30 of the Massachusetts General Laws

Attention is directed to the following sections of Chapter 30 of the General Laws of Massachusetts as amended to date:

Section 39F. "(1) Every contract awarded pursuant to sections forty-four A to L inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor."

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth-day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy-days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth-day after the subcontractor has substantially completed the subcontract work. Within ten-days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen-days after receipt of the demand by the awarding authority, but in no event prior to the seventieth-day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

(i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor doe snot submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn replay as provided in that same subparagraph. A demand made after the first-day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g), and (h)."

Section 39G. "Upon substantial completion of the work required by a contract with the commonwealth, or any agency or political subdivision thereof, for the construction, reconstruction, alteration, remodeling, repair or improvement of public ways, including bridges and other highway structures, sewers and water mains, airports and other public works, the contractor shall present in writing to the awarding authority its certification that the work has been substantially completed. Within twenty-one-days thereafter, the awarding authority shall present to the contractor either a written declaration that the work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the contract sufficient to demonstrate that the work has not been substantially completed. The awarding authority may include with such list a notice setting forth a reasonable time, which shall not in any even be prior to the contract completion date, within which the contractor must achieve substantial completion of the work. In the event that the awarding authority fails to respond by presentation of a written declaration or itemized list as aforesaid, to the contractor's certificate within the twenty-one-day period, the contractor's certification shall take effect as the awarding authority's declaration that the work has been substantially completed."

"Within sixty-five-days after the effective date of a declaration of substantial completion, the awarding authority shall prepare and forthwith send to the contractor for acceptance a substantial completion estimate for the quantity and price of the work done and all but one percent retainage on that work, including the quantity, price and all but one percent retainage for the undisputed part of each work item and extra work item in dispute but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory work items and less the total periodic payments made to date for the work. The awarding authority also shall deduct from the substantial completion estimate an amount equal to the sum of all demands for direct payment filed by subcontractors and not yet paid to subcontractors or deposited in joint accounts pursuant to section thirty-nine F, but no contract subject to said section thirty-nine F shall contain any other provisions authorizing the awarding authority to deduct any amount by virtue of claims asserted against the contract by subcontractors, material suppliers or other."

"If the awarding authority fails to prepare and send to the contractor any substantial completion estimate required by this section on or before the date hereinabove set forth, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such substantial completion estimate at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the awarding authority sends that substantial completion estimate to the contractor for acceptance or to the date of payment therefore, whichever occurs first. The awarding authority shall include the amount of such interest in the substantial completion estimate."

"Within fifteen-days after the effective date of the declaration of substantial completion, the awarding authority shall send to the contractor by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory work items, and, unless delayed by causes beyond his control, the contractor shall complete all such work items within forty-five-days after the receipt of such list or before the then contract completion date, whichever is later. If the contractor fails to complete such work within such time, the awarding authority may, subsequent to seven-days' written notice to the contractor by certified mail, return receipt requested, terminate the contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the contractor."

"Within thirty-days after receipt by the awarding authority of a notice from the contractor stating that all of the work required by the contract has been completed, the awarding authority shall prepare and forthwith send to the contractor for acceptance a final estimate for the quantity and price of the work done and all retainage on that work less all payments made to date, unless the awarding authority's inspection shows that work items required by the contract remain incomplete or unsatisfactory, or that documentation required by the contract has not been completed. If the awarding authority fails to prepare and send to the contractor the final estimate within thirty-days after receipt of notice of completion, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such final estimate at the rate hereinabove provided from the thirtieth-day after such completion until the date on which the awarding authority sends the final estimate to the contractor for acceptance or the date of payment therefore, whichever occurs first, provided that the awarding authority's inspection shows that not work items required by the contract remain incomplete or unsatisfactory. Interest shall not be paid hereunder on amounts for which interest is required to be paid in connection with the substantial completion estimate as hereinabove provided. The awarding authority shall include the amount of the interest required to be paid hereunder in the final estimate."

"The awarding authority shall pay the amount due pursuant to any periodic, substantial completion or final estimate within thirty-five-days after receipt of written acceptance for such estimate from the contractor and shall pay interest on the amount due pursuant to such estimate at the rate hereinabove provided from that thirty-fifth-day to the date of payment. In the case of periodic payment, the contracting authority may deduct from its payment a retention based on its estimate of the fair value of its claim against the contractor, a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and a retention to secure satisfactory performance of the contractual work not exceeding five percent of the approved amount of any periodic payments, and the same right to retention shall apply to bonded subcontractors entitled to direct payment under section thirty-nine F of chapter thirty; provided that a five percent value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance."

"No periodic, substantial completion or final estimate or acceptance or payment thereof shall bar a contractor from reserving all rights to dispute the quantity and amount of, or the failure of the awarding authority to approve a quantity and amount of, all or part of any work item or extra work item."

"Substantial completion, for the purposes of this section, shall mean either that the work required by the contract has been completed except for work having a contract price of less than one percent of the then adjusted total contract price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the contract."

Section 39K. "Every contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building by the commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount is more than five thousand dollars in the case of the commonwealth and more than two thousand dollars in the case of any county, city, town, district, board, commission or public body, shall contain the following paragraph: Within fifteen-days (twenty-four-days in the case of the commonwealth) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five percent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five-days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one percent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less, (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work less (2) a retention for direct payments to subcontractors based on demand for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston commencing on the first-day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen-days (twenty-four-days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a

place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor."

"The awarding authority may make changes in any periodic estimate submitted by the contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the awarding authority may, within seven-days after receipt, return to the contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically corrected and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty-nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this section applies."

"All periodic estimates shall be submitted to the awarding authority, or to its designee as set forth in writing to the contractor, and the date of receipt by the awarding authority or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed sub trade and each sub trade listed in sub-bid form as required by specifications and a column listing the amount paid to each filed subcontractor and Sub-subcontractor as of the date the periodic estimate is filed. The person making payment for the awarding authority shall add the daily interest provided for herein to each payment for each day beyond the due date based on the date of receipt marked on the estimate."

"A certificate of the architect to the effect that the contractor has fully or substantially completed the work shall, subject to the provisions of section thirty-nine J, is conclusive for the purposes of this section."

Section 39L. "Public Construction work by foreign corporations; restrictions and reports." The Commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, request proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for such work with, and shall not approve as a subcontractor furnishing labor and materials for a part of any such work, a foreign corporation which has not filed with such awarding authority a certificate of the state secretary stating that such corporation has complied with sections three and five of chapter one hundred and eighty-one and the date of such compliance, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the commonwealth."

Section 39M(b). "Specifications for such contracts, and specifications for contracts awarded pursuant to the provisions of said sections forty-four A to forty-four L of said chapter one hundred and forty-nine, shall be written to provide for full competition for each item of material to be furnished under the contract; except, however, that said specifications may be otherwise written for sound reasons in the public interest stated in writing in the public records of the awarding authority or promptly given in writing by the awarding authority to anyone making a written request therefore, in either instance such writing to be prepared after reasonable investigation. Every such contract shall provide that an item equal to that named or described in the said specifications may be furnished; and an item shall be considered equal to the item so named or described if (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for or the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said specifications."

"For each item of material the specifications shall provide for either a minimum of three named brands of material or a description of material which can be met by a minimum of three manufacturers or producers, and for the equal of any one of said named or described materials."

Section 39N. Every contract subject to section forty-four A of Chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

"If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly."

Section 39O. Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety....

(a) "The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to the appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen-days or more due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions."

(b) "The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty-days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim."

Section 39P. "Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter on hundred forty-nine which requires the awarding authority, or any official, its architect or engineer to made a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any even, no later than thirty-days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty-days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty-day period and the date by which the decision will be made."

Section 39R(a). The words defined herein shall have the meaning stated below whenever they appear in this section:

(1) "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to section thirty-nine M of chapter thirty, sections forty-four A through H, inclusive, of chapter one hundred and forty-nine and sections thirty B through thirty P, inclusive, of chapter seven.

(2) "Contract" means any contract awarded or executed pursuant to sections thirty B through thirty P, inclusive, of chapter seven and any contract awarded or executed pursuant to section thirty-nine M of chapter thirty, or sections forty-four A through H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than on hundred thousand dollars

(3) "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

(4) "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

(5) "Audit," when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

(6) "Accountant's Report," when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he/she has made and sets forth his/her opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefore shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.

(7) "Management," when used herein, means the chief executive officer, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the contractor.

(8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

(b) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty B through thirty P, inclusive, of chapter seven, and pursuant to section thirty-nine M of chapter thirty or to section forth-five A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

(1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and

(2) Until the expiration of six years after final payment, the awarding authority, office of inspector general, and the deputy commissioner of capital planning and operations shall have the right to examine any books, documents, papers or records of the contractor or of his/her subcontractors that directly pertain to, and involve transactions relating to, the contractor or his/her subcontractors, and

(3) If the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his/her description the date of the change and reasons therefore, and shall accompany said descriptions with a letter from the contractor's independent certified public accountant approving or otherwise commenting on the changes, and

(4) If the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and

(5) If the agreement is a contract as defined herein, the contractor has field prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.

(c) Every contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and subsidiaries reasonably assures that:

(1) Transactions are executed in accordance with management's general and specific authorization;

(2) Transactions are recorded as necessary:

i. To permit preparation of financial statements in conformity with generally accepted accounting principles, and

ii. To maintain accountability for assets;

(3) Access to assets is permitted only in accordance with management's general or specific authorization; and

(4) The recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he/she has examined the statement of management on internal accounting controls, and expressing an opinion as to:

(1) Whether the representations of management in response to this paragraph, and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and

(2) Whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

(d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the awarding authority and the deputy commissioner of capital planning and operations during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an account-ant's report. Such statements shall be made available to the awarding authority upon request.

(e) The office of inspector general, the deputy commissioner for capital planning and operations and any other awarding authority shall enforce the provisions of this section. The deputy commissioner of capital planning and operations may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

(f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).

Section 40. "Bonds give to the commonwealth, any county, city, town or political subdivision to secure the performance of contracts for the construction or repair of public buildings or other public works may be discharged or released by the awarding authority, upon such terms as it deems expedient, after the expiration of one year from the time of completion, subject to section thirty-nine K, of the work contracted to be done; provided that no claim filed under said bond is pending, and provided further, that no such bonds shall be discharged or released prior to the expiration of all special guarantees provided for in the contract unless new bonds in substitution therefore specifically relating to the unexpired guarantees shall be taken."

EQUAL EMPLOYMENT OPPORTUNITIES

The Contractor and each Subcontractor shall comply with the provisions of the Governor's "Executive Order No. 74", dated July 20, 1970, entitled the "Governor's Code of Fair Practices", as amended by the Governor's "Executive Order No. 116", dated May 1, 1975; with the Fair Employment Practices Law of Massachusetts, as amended; with the Rules and Regulations of the Massachusetts Commission Against Discrimination, as in force at the date hereof; and with all other applicable municipal, state and federal laws and regulation regarding equal employment opportunity.

Part B
Specifications

Division 1
General Requirements

SECTION 011000

SUMMARY OF WORK

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 CONTRACT CONDITIONS SPECIFICALLY REQUIRED BY LAW

A. This Contract is subject to all State and local laws, and all amendments thereto, and where any requirements contained herein do not conform to such statutes governing that construction work of this Contract, the statutes shall govern.

B. Special attention shall be given to the requirements of Chapter 30, Section 9 (1), of the General Laws of the Commonwealth of Massachusetts, and all amendments thereto, concerning conformity of work with the Contract Documents; deviations; certificates; penalties; and the provisions contained herein are hereby made a part of this Contract as if set forth in full herein.

C. Every employee in public work shall lodge, board, and trade where and with whom he elects; and no person or his agents or employees under Contract with the Commonwealth, a county, city, or with a department, board, commission, or officer acting therefor for the doing of public work shall directly or indirectly require as a condition of employment there in that the employee shall lodge, board, or trade at a particular place or with a particular person, and compliance with this provision of law is a condition of this Contract.

D. The General Contractor shall, before commencing performance of this Contract, provide by insurance for the payment of compensation and furnishing of other benefits under the General Laws, Chapter 152, to all persons to be employed under this Contract, and the General Contractor shall continue such insurance in full force and effect during the term of this Contract.

1.03 WORK UNDER THIS CONTRACT

A. The work to be performed under this Contract, Early Site Preparation at Woburn Fire Headquarters, is as follows:

1. Furnish all plant, labor, equipment, appliances and materials and perform all operations required for the **Early Site Preparation** at Woburn Fire Headquarters, Woburn, MA as shown on the drawings and as specified herein including, but not limited to:

a. Installation of construction fencing with designated gates. Fencing to be left in place and become the property of the Owner upon completion of the contract.

b. Construction of temporary erosion controls and stormwater management facilities.

c. Excavation and removal from the site topsoil and subsoil to elevations shown on the drawings (including dewatering).

1) Under Base Bid the disposal of surplus topsoil and subsoil shall be the responsibility of the Contractor and the cost included in the Base Bid.

2) Under Alternate No. 1, the topsoil and subsoil shall remain the property of the Owner, and the Contractor shall load, haul, transport and stockpile it at a site to be determined in the City of Woburn. Refer to SECTION 012300-ALTERNATES.

d. Removal of rock to elevations shown on the drawings and removal from site.

e. Placing new compacted fills where designated on the Drawings.

B. The work described by:

1. These Specifications, as enumerated in the "Table of Contents".

2. Plans as numbered on List of Drawings.

3. Addenda issued during the bidding period which are hereby made a part of the Specifications.

4. The printed form of Contract.

C. The distribution of work in these Specifications.

1. It is intended to be described under the appropriate trade.

2. May be redistributed, except as directed herein, provided no controversy will arise among the trades and progress will not be delayed.

D. The committing of nuisances on the land of the Project and adjacent property shall be rigorously prohibited and adequate steps taken to prevent it.

E. Up to five (5) sets of contract plans and specifications will be furnished by the Owner immediately after signing of the Contract, one of which shall remain intact at the site for reference by authorized representatives of the Owner. Additional copies will be furnished at cost.

1.04 WORK TO BE PERFORMED UNDER SEPARATE CONTRACTS

A. The drawings show existing trees to be removed and/or relocated by the City.

1.05 UTILITY BACKCHARGES

NOT USED

1.06 COORDINATION, COOPERATION, AND GIVING INFORMATION

A. The Contractor shall give full cooperation to all Subcontractors and shall furnish all information necessary to permit the Work to be installed satisfactorily and with the least possible interference or delay.

B. Structural material shall not be relocated, altered, or changed in any way to accommodate the work.

C. The Contractor shall coordinate the exchange of shop drawings between Subcontractors.

D. Equipment and systems shall not be installed without first coordinating the location and installation of equipment and systems with the Contractor and all other Subcontractors. Notify the Contractor of congested and problem areas prior to installation of Work or preparation of shop drawings and do not proceed with the installation in problem areas until instructed by the Contractor. Any material installed or Work performed in violation of this requirement shall be readjusted and corrected without charge.

E. When additional work, change to the work, or a revision or modification of the Work is authorized, provide the required additional material, equipment, personnel and workmen to prevent delays in the Work and to complete the Work within the time limit of the Contract.

1.07 REPAIR OF EXISTING SITEWORK TO REMAIN

A. The General Contractor will be responsible for the repair of any existing site element (lawns, plantings, pavement, curbing, etc.) to remain that is disturbed by the performance of the work of this contract. Existing site elements shall be repaired with like materials to their pre-existing condition.

1.08 EXAMINATION OF SITE AND DOCUMENTS

A. All bidders shall visit the site and examine all Contract Documents before submitting a bid. Inspect and be thoroughly familiar with same and conditions under which work will be carried out. Neither the Owner nor the Architect will be responsible for errors, omissions and/or charges for extra work arising from General or Subcontractor's failure to familiarize themselves with Contract Documents or existing conditions. By submitting a bid, the bidder agrees and warrants that he has examined the site and the Construction Documents, that he is familiar with the conditions and requirements of both and where they require, in any part of the work, a given result to be produced that the Contract Documents are adequate and that he will produce the required result.

B. A pre-bid conference will be held to examine the existing site conditions at 2:00 PM on Thursday, 09 July 2020, meeting at the project site at Main Street and Forest Park Road, Woburn, MA.

1.09 EXISTING UTILITIES

A. Existing active utility lines indicated on the Drawing, including without limitation, cables, ducts, conduits, and piping shall, if damaged, be immediately repaired, inspected by the utility company, protected and maintained in use at no additional cost to the Owner.

B. The General Contractor shall notify the Owner in writing three (3) days in advance of the proposed time for shutting down or interrupting any utilities, services, or facilities which may affect the operation of other buildings, services, or facilities of the Owner. Unless other wise authorized by the Owner, he shall schedule and coordinate his work that such interruption will occur on weekends, holidays, or before or after the normal working day of the Owner's facilities. In no case shall any shutdown or interruption of any utilities, services, or facilities be made without the approval and authorization of the Owner.

C. In the event that an active utility line is encountered which is not indicated on the drawings, immediately notify the utility company and the Architect of the exact location, size and type of utility line encountered. Such utility line, if damaged, shall be immediately repaired, inspected by the Utility Company, protected and maintained in use by the Contractor. If the Architect determines that such line be relocated, abandoned, cut and capped, or other wise altered, the Contractor shall consult the Utility Company and perform required work. The Contract price will be adjusted for the cost of any repairs, protection maintenance and other work in accordance with the General Conditions and SECTION 012200-UNIT PRICES.

D. The Owner will cooperate fully, at the General Contractor's request in assisting the General Contractor in locating and identifying underground utilities.

E. In the event poles, wire, or other property situated on public highways, or private ways, owned by the Telephone Company, other corporations, utility companies, municipal agencies, or individuals necessitate being moved or relocated due to the Work, the Contractor shall arrange for and bear the expense thereof.

F. Contractors must notify "Dig-Safe" of contemplated excavation, demolition, or explosive work in public or private ways, and any Utility Company Right of Way or Easement. They are located at 111 South Bedford Road, Burlington, MA 01803, telephone number 1-800-322-4844.

1. This notification must be made at least 72 hours prior to the work, but not more than sixty days before the contemplated work. Such notice shall set forth the name of the street or the route number of said way and an accurate description of the location and nature of the proposed work.

2. The Owner requires that the notification be sent to "Dig-Safe" by Certified Mail.

3. "Dig-Safe" is required to respond to the notice within 72 hours from the time said notice is received by designating at the locus the location of pipes, mains, wires or conduits.

4. Contractor shall not commence work until "Dig-Safe" has responded as noted above. The work shall then be performed in such a manner, and with reasonable precautions taken to avoid damage to utilities under the surface in said areas of work.

1.10 OWNER RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

A. The Owner reserves the right to perform work related to the Project with its own forces and to award separate contracts in connection with other portions of the Project or other work on the premises under these or similar Conditions of the Contract. If the General Contractor claims that delay or additional cost is involved because of such action by the Owner, he shall make such claim as provided elsewhere in the Contract Documents.

1. The Owner will provide for the coordination of the work of its own forces and of each separate contractor with the Work of the General Contractor, who shall cooperate therewith as provided under article below entitled MUTUAL RESPONSIBILITY.

1.11 OWNER'S PROJECT MANAGER AND FIELD REPRESENTATIVE

A. The Owner designates Municipal Building Consultants, Inc. as the Owner's Project Manager (at times referred to in the Contract Documents as the "OPM"), to represent the Owner during the progress of the Project. The Owner's Project Manager shall report to and advise the Owner and Architect in accordance with the agreement between those parties. The Owner's Project Manager shall not, by undertaking to represent the Owner, incur any obligation to the Contractor, and nothing stated herein shall act to create any contractual relationship between the Contractor and the Owner's Project Manager. The Owner's Project Manager shall not have the authority to direct changes in the Work, or to agree to an adjustment of the Contract Time or the Contract Sum. A Field Representative shall be engaged by the Owner's Project Manager on behalf of the Owner. The Field Representative shall represent the Owner and the Owner's Project Manager. The Field Representative will observe the progress of the work, but he shall have no authority to speak for or in any manner bind the Owner or the Architect.

1.12 TESTS AND INSPECTIONS

A. The General Contractor shall make such tests and inspections of his workmanship and materials as may be required by the Building Code, State or municipal laws, or as called for under the various SECTIONS of the Specifications.

B. All expense attached to such tests and inspections, unless otherwise specified under the various SECTIONS of the Specifications shall be borne by the General Contractor, who shall furnish all labor, tools, instruments, water, temporary power and light, construction and equipment necessary for these tests and inspections. Records of all tests and inspections shall be furnished to the Architect. The General Contractor shall remove all temporary work, materials, and equipment upon completion of test and inspections.

C. Where in the various SECTIONS of the Specifications, inspection and testing of materials, processes, and the like is called for, the selection of bureaus, laboratories, and/or agencies for such inspection and testing shall be subject to approval of the Architect.

D. Should any material or work be found, after testing or inspection, to be defective or inferior, such material and/or work shall be removed and replaced with new sound materials and/or work as approved by the Architect. The removal and replacement herein called for shall be at the General Contractor's expense.

1.13 CUTTING, REMOVALS AND RELOCATIONS

A. All necessary cutting, drilling, grouting and patching to fit together properly the several parts of the work shall be done by the General Contractor, except as may be specifically noted otherwise under any particular sub-trade section of the specifications.

1.14 MATERIALS AND WORKMANSHIP

A. All materials required for the performance of this Contract shall be new and of best quality of kinds specified, all subject to the approval of the Architect. The use of old or second-hand materials is strictly forbidden except if called for in the CONTRACT DOCUMENTS. The General Contractor shall, if required by the Architect, furnish satisfactory evidence as to the kind and quality of material and workmanship. Materials shall be used in accordance with the manufacturer's printed instruction unless otherwise specified. Upon request of the Architect to the General Contractor, the manufacturer's representative shall go to the site and instruct the mechanics in the use of the materials or shall supervise their use.

B. For the execution of the work to be performed under this Contract and for the manufacturer or transportation of any of the materials or appliances to be used or installed, the General Contractor shall employ only such labor throughout as will not interfere with the speedy and uninterrupted completion of the building. All work shall be done by mechanics skilled in their trade.

C. All materials shall be ordered, manufactured, and delivered at such times and in such manner as will insure the speedy and uninterrupted progress of the work, the least obstruction to the premises; and such materials shall be so distributed as to cause no overloading at any point. If any material so stored obstructs the progress of any portion of the various parts of the work, they shall be moved from place to place or from the premises, as the Architect may direct, at the expense of the General Contractor or Subcontractor involved.

D. The General Contractor and his Subcontractors shall carry on the work with the greatest reasonable speed, consistent with first-class workmanship, and without interfering with or delaying the work of others.

E. Any materials delivered, or work performed, contrary to the CONTRACT DOCUMENTS and approved shop drawings, shall be removed by the General Contractor or the Subcontractor at fault, at his own expense, and the same shall be replaced with other materials or work satisfactory to the Architect. The General Contractor or Subcontractor at fault shall also assume the cost of replacing the work which may be disturbed while making good the defective work.

F. The Architect, however, reserves the right to allow such defective materials or workmanship to stand, in which case an amount equal to the difference in value between the work and material provided and that specified shall be deducted from the amount due or to become due under the Contract. If a suitable mutually agreeable credit cannot be worked out defective material or workmanship shall be replaced.

G. Any materials specified or work shown on the Drawings which the General Contractor cannot guarantee against defects shall be called to the attention of the Architect in writing before installation in the building. Installation without such notice shall bind the General Contractor to his full guarantee.

1.15 TIMES FOR COMPLETION AND LIQUIDATED DAMAGES

A. It is hereby understood and mutually agreed, by and between the General Contractor and the Owner, that the date of beginning and the time for completion, as specified in the Contact for the work to be done thereunder are ESSENTIAL CONDITIONS of this Contract, and it is further mutually understood and agreed that the work embraced in this Contract shall be commenced by the date specified therein.

B. The General Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the General Contractor and Owner, that the time for the completion of the work described herein are reasonable times for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

C. If the General Contractor should neglect, fail, or refuse to complete the work of any phase by the times specified in the Contract, or any proper extension thereof, granted by the Owner, then the General Contractor does hereby agree, as part consideration for the awarding of this Contract, to pay to the Owner the amount specified in the Contract, not as a penalty, but as liquidated damages for such breach of Contract as hereinafter set forth, for each and every calendar day that the General Contractor shall be in default after the times stipulated in the Contract for completion of the work. **The liquidated damages shall be $500.00 (five hundred dollars) per calendar day.**

D. The said amounts are fixed and agreed upon by and between the General Contractor and the Owner because of the impracticability and extreme difficult of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

E. It is further agreed that time is of the essence of each and every portion of the CONTRACT and of the CONTRACT DOCUMENTS wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided, that the General Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

1. To any preference, priority, or allocation order duly issued by the Government;

2. To unforeseeable causes beyond the control and without the fault or negligence of the General Contractor, including but not restricted to, Acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a Contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusual weather.

3. To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subparagraphs 1. and 2. of this Paragraph.

   Provided, further, that the General Contractor shall, within ten days form the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the Contract, notify the Owner, in writing, of the causes of the delay and notify the General Contractor within a reasonable time of its decision in the matter.

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

G. The contract shall be awarded and a Notice to Proceed issued within five (5) working days of receipt of General Bids. Work shall be commenced upon receipt of the Notice to Proceed and shall be substantially completed 18 November 2020.

1.16 WAGE RATES

A. There shall be paid each laborer or mechanic of the General Contractor or Subcontractor engaged in work on the project under this Contract in the trades of occupations listed in SECTION 018300-MINIMUM WAGE RATES, not less than the hourly wage rate as stated therein and list opposite the same, regardless of any contractual relationship which may be alleged to existing between the General Contractor or any Subcontractor and such laborers and mechanics.

1.17 MANUFACTURER PREFERENCE

A. Attention is directed to the provisions of General Laws of Massachusetts (Ter. Ed.), Chapter 7, Section 22, Paragraph 17, which states as follows: "A preference in the purchase of supplies and materials, other considerations begin equal, in favor, first, of... supplies and materials and materials manufactured and sold within the Commonwealth; second, to supplies materials manufactured and sold elsewhere within the United States."

1.18 POLICE DETAILS

A. The Woburn Police Department will determine when police details will be required (such as construction work in the public way). The City of Woburn is responsible for the payment of police details used for this contract at no cost to the General Contractor.

B. The General Contractor is responsible for the scheduling of details with the Owner's Project Manager.

1.19 BUILDING PERMIT

A. The City has waived the fees for all permits and inspections by the City necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

B. NPDES Permit: The Contractor shall be responsible for preparing and submitting and securing a NPDES (National Pollutant Discharge Elimination System) permit from EPA and DEP. This involves preparing a Pollution Prevention Plan.

1. At least 48 hours prior to any work or equipment going on site, an EPA NPDES Notice of Intent form must be postmarked and sent to the U.S. EPA at Storm Water Notice of Intent (4203), 401 M Street S.W., Washington, D.C. 20460.
2. A copy of the Pollution Prevention Plan must be kept on the site at all times.
3. Once the work of this Contract is complete, and all disturbed soil is stabilized or vegetated the contractor shall file a Notice of Termination with the EPS.
4. The necessary forms and other information necessary to complete this work can be obtained from the Regional EPA Office.
5. The Contractor shall likewise secure a NOI from the DEP for NPDES. The Contractor must secure this permit prior to starting any sitework. The Owner's Representative will supply these forms to the Contractor.

1.20 SALES TAX EXEMPTION

A. All materials and items which will be incorporated into the project, and which will become the property of the Owner upon completion of said project, will be exempt from the Massachusetts Sales Tax. The Owner will provide to the General Contractor the Sales Tax Exemption Number, applicable for the project, and said number shall be included when ordering materials for the project.

1.21 SPECIAL CONTROLS

A. The following are special provisions concerning Worker Conduct for this project:

1. All workers on the project are required to conduct themselves in a professional manner. Abusive or obscene language or gestures will not be tolerated.
2. Use of any tobacco products, alcohol or drugs on City property is prohibited. Violators will be subject to arrest; no warning will be issued.
3. Workers shall wear shirts at all times, with no offensive text or images.

B. Loud and/or abusive language – Due to the work being performed adjacent to a residential neighborhood, the General Contractor's and Subcontractors' personnel shall exercise caution to refrain from loud and/or abusive language.

C. The Owner reserves the right to have any worker barred from the construction site for violation of these rules.

1.22 COVID-19

A. The General Contractor shall be solely responsible for the implementation of and adherence to all applicable regulations and guidelines in the performance of the work of this contract which pertain to the COVID-19 pandemic, all costs for which shall be included in the Contract Price.

END OF SECTION

SECTION 012200

UNIT PRICES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 UNIT PRICES

A. The predetermined Unit Prices for items of work set forth in the Schedule of Unit Prices attached to this Section shall be used to determine adjustments to the Contract Sum when changes in the work involving said items are made in accordance with the Contract Documents.

B. ***Unit Prices listed under ADDITIONS have been computed at net cost plus overhead, profit and all other charges.*** Unit Prices listed under DEDUCTIONS have been computed at net cost alone. Unit Prices shall apply until the date of Substantial Completion established at the time of Contract signing.

C. ***Unit Prices for excavation include the costs of sheeting and bracing, pumping and dewatering, on-site handling and stockpiling, and all other costs in connection therewith.***

D. All materials, methods of installation, and definitions of terms set forth under the various Unit Price items in the Schedule of Unit Prices shall be as indicated in the Contract Documents.

1.03 APPLICABILITY OF UNIT PRICES

A. The bid amount shall be based on the grades and payment lines as indicated in the Contract Documents. Payment shall be based on actual excavation and backfill volumes. Refer to SECTION 312000-EARTHWORK.

B. Prior to commencing removal or placement of materials set forth in the Schedule of Unit Prices, the Contractor shall notify the Architect in sufficient time to permit in place measurements to be taken on behalf of the Owner. Only quantities which have been approved in writing by the Architect will be considered in the determination of adjustments to the Contract Sum.

C. Performance of work which is not required under the Contract Documents or which is not authorized by Change Order, whether or not such work items are set forth hereunder as a Unit Price item, shall not be considered cause for any extra payment on account of the Contract. The Contractor will be held fully responsible for such unauthorized work, including the performance of all corrective measures required by the Architect.

SECTION 012200

SCHEDULE OF UNIT PRICES

		Additions	Deductions
1.	General excavation by machine. Material left on site as directed.	$6.60/CY	$5.28/CY
2.	General excavation by machine. Material removed from site.	$14.60/CY	$11.68/CY
3.	Trench excavation by machine. Material left on site as directed.	$10.80/CY	$8.64/CY
4.	Trench excavation by machine. Material removed from site.	$18.80/CY	$15.04/CY
5.	Hand excavation to 6 feet depth. Material left on site as directed.	$55.00/CY	$44.00/CY
6.	Hand excavation to 6 feet depth. Material removed from site.	$63.00/CY	$50.40/CY
7.	Hand excavation per each foot of additional depth below 6 feet. (Add to items 5 or 6)	$50.00/CY	$40.00/CY
8.	Rock excavation encountered in general excavation using explosives. Material left on site as directed.	$80.00/CY	$72.00/CY
9.	Rock excavation encountered in general excavation using explosives. Material removed from site.	$100.00/CY	$80.00/CY
10.	Rock excavation encountered in trenches and piers using explosives. Material left on site as directed.	$105.00/CY	$84.00/CY
11.	Rock excavation encountered in trenches and piers using explosives. Material removed from site.	$115.00/CY	$92.00/CY
12.	Rock excavation encountered in general excavation using non-blasting methods. Material left on site as directed.	$90.00/CY	$72.00/CY
13.	Rock excavation encountered in general excavation using non-blasting methods. Material removed from site.	$100.00/CY	$80.00/CY

		Additions	Deductions
14.	Rock excavation encountered in trenches and piers using non-blasting methods. Material left on site as directed.	$105.00/CY	$84.00/CY
15.	Rock excavation encountered in trenches and piers using non-blasting methods. Material removed from site.	$115.00/CY	$92.00/CY
16.	Removal of boulders over 2 Cu.Yd. encountered in general excavation. Material left on site as directed.	$66.00/CY	$52.80/CY
17.	Removal of boulders over 2 Cu.Yd. encountered in general excavation. Material removed from site.	$67.00/CY	$53.60/CY
18.	Removal of boulders over 1 Cu.Yd. encountered in trench excavation. Material left on site as directed.	$50.50/CY	$40.50/CY
19.	Removal of boulders over 1 Cu.Yd. encountered in trench excavation. Material removed from site.	$58.50/CY	$48.50/CY
20.	Removal of peat or organic soil. encountered in general excavation. Material removed from site.	$15.00/CY	$12.00/CY
21.	Dense graded crushed stone, in place, compacted as specified.	$24.00/CY	$19.20/CY
22.	Sand-Gravel fill (gravel borrow), in place, compacted as specified.	$30.00/CY	$24.00/CY
23.	Drainage fill/crushed stone, in place, compacted as specified	$26.00/CY	$20.80/CY
24.	Off-site granular fill (borrowed) in place, compacted as specified.	$22.00/CY	$17.60/CY
24A.	Off-site granular fill (borrowed) in trenches in place, compacted as specified.	$32.00/CY	$25.60/CY
25.	Common fill (ordinary borrow), in place, compacted as specified.	$17.50/CY	$14.00/CY
26.	Sand fill around pipes in trenches, in place, as specified.	$14.75/CY	$11.75/CY

27.	Loaming and seeding, including placing loam, site stabilization and maintenance.	$55.00/CY Loam $0.32/SF Hydroseed	$44.00/CY $0.26/SF

END OF SECTION

SECTION 012300

ALTERNATES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 SCOPE OF WORK

A. The schedule attached to this SECTION lists all the Alternates which appear in the Contract Documents, and the Sections of the Specifications which are affected by each Alternate. Consult the individual Section for detailed requirements of each Alternate.

1.03 GENERAL INSTRUCTIONS

A. Each General Bidder shall be held fully responsible for examining the scope of the Alternates generally defined herein and for recognizing any modifications to his work caused by any Alternate whether or not his particular trade SECTION is mentioned therein.

B. All SECTIONS of work which are affected by the Alternates will be considered work to be performed by the General Contractor.

C. General Bidders shall enter a single amount in the appropriate space provided in the FORM FOR GENERAL BID which total amount shall consist of the amount for all work to be performed by the General Contractor.

D. The work of the various trades to be performed under Alternates shall be in strict accordance with the requirements of the particular trade SECTION of the SPECIFICATIONS.

E. Bid prices for each Alternate shall include overhead, profit, and all other expense incidental to the Work under each Alternate.

1.04 LIST OF ALTERNATES

A. Base Bid – Under the Base Bid the Contractor shall be responsible for the removal and off-site disposal of all surplus topsoil and subsoil excavated from the site, said material being the property of the Contractor.

B. Alternate No. 1 – Under Alternate No. 1, the City shall maintain ownership of the surplus topsoil and subsoil. The Contractor shall include in the price of Alternate No. 1 the following:

1. Loading, hauling and stockpiling the surplus topsoil and subsoil to a single site within the City of Woburn, location to be determined.

2. Installing soil stockpile protections at the stockpiled topsoil and subsoil as shown on drawing ESP-3. There shall be one stockpile for loam and one stockpile for subsoil.

END OF SECTION

SECTION 013100

PROJECT PROCEDURES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 WORK SEQUENCE

A. Prior to beginning site stripping and earthwork operations, comply with the following:

1. Not less than 14 days prior to beginning earthwork operations, the General Contractor shall submit the Stormwater Pollution Prevention Plan (SWPPP) to the Architect for approval.
2. Construct temporary drainage and siltation controls as shown on the drawings.

1.03 CONTRACTOR USE OF SITE

A. General: The General contractor has full use of the site.

B. Use of the Site:

1. Confine operations to areas within the contract Limit of Work line as indicated on the Drawings.
2. Portions of the site beyond area in which construction operations is indicated are not to be disturbed.

C. Site Access:

1. The hours of on-site operations are from **7:00AM to 5:00PM Monday through Friday. Construction vehicles and equipment shall not be started before 7:00AM.**
   a. Only with Owner's prior approval, on-site operations **may** be allowed on Saturdays, the hours of which shall be 9:00 AM to 5:00 PM with equipment not to be started before 9:00 AM.
2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

3. Workers shall park on site. On-street parking is not allowed.

4. Keep sidewalk clear along Main Street for continued use by the public.

5. Refer to the map in “Attachment A – Transportation Routes for Construction Vehicles” appended to this section. Note that:

   a. Construction Vehicles shall not que up on city streets.

   b. Construction vehicle traffic is forbidden on Winn Stree, Lowell Street and Wyman Street.

D. General Contractor shall control dust on site and shall keep roadways clean of dirt and debris from construction operations. Refer to SECTION 015000 – TEMPORARY FACILITIES AND CONTROLS.

1.04 MISCELLANEOUS PROVISIONS

A. Installation Sequencing:

1. Examine materials and installations performed by others before starting next stage or adjacent work.

2. Notify Architect immediately of unsatisfactory conditions which hinder or restrict correct installation of next stage or adjacent work.

3. Start of next stage or adjacent work will be construed as acceptance of previous or adjacent work.

4. Any work requiring subsequent removal or replacement due to unsatisfactory or defective work shall be at the Contractor's expense.

B. Contract Document Review:

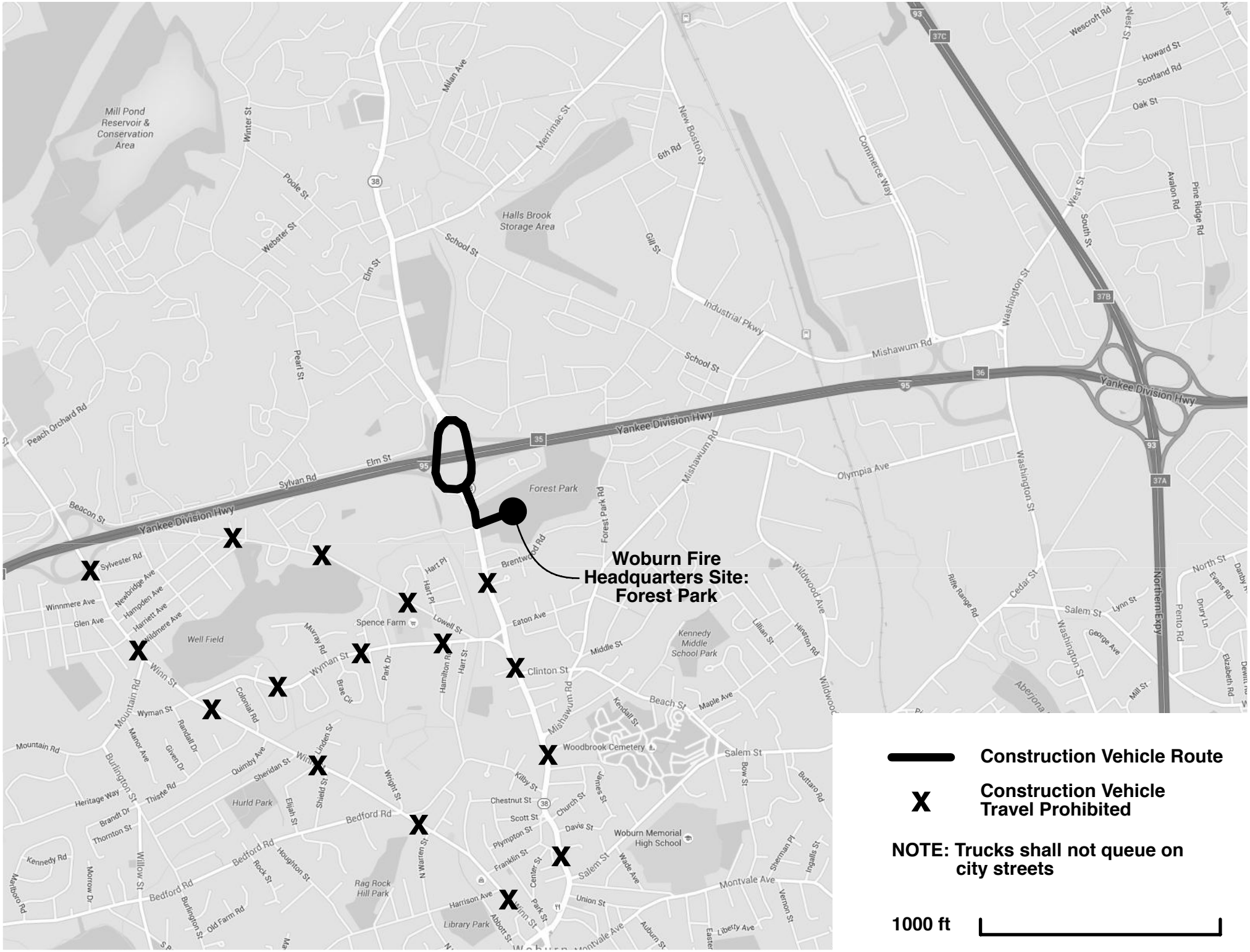
1. Before execution of work, the Contractor shall review all Drawings and Specifications and shall immediately report all errors, discrepancies, and/or omissions discovered to the Architect, in writing, with one set of Contract Documents marked in red pencil, clearly indicating the discrepancies.

2. Omissions from the Drawings and/or the Specifications or the misdescription of details of Work which are manifestly necessary to carry out the intent of the Drawings and Specifications, or are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the Work; but shall be performed as if fully and correctly set forth and described in the Drawings and Specifications, using the most appropriate method, with final approval issued by the Architect to alleviate conflicts of scheduling, Drawings, Details, and/or Specifications.

END OF SECTION

ATTACHMENT A

Transportation Routes for Construction Vehicles


Woburn Fire Headquarters Site: Forest Park
Construction Vehicle Route
Construction Vehicle Travel Prohibited
NOTE: Trucks shall not queue on city streets
1000 ft
Yankee Division Hwy
Forest Park
Mill Pond Reservoir & Conservation Area
Halls Brook Storage Area
Well Field
Spence Farm
Hurld Park
Rag Rock Hill Park
Library Park
Kennedy Middle School Park
Woburn Memorial High School
Woodbrook Cemetery
Mishawum Rd
Industrial Pkwy
Commerce Way
Washington St
Elm St
School St
Bedford Rd
Salem St
Clinton St
Wyman St
Winn St
Mountain Rd
Beach St
Montvale Ave
Olympia Ave
Lowell St
Eaton Ave
Middle St
Maple Ave
Kendall St
Chestnut St
Scott St
Plympton St
Franklin St
Harrison Ave
Union St
Wade Ave
Davis St
Church St
Jaques St
Killoy St
Wright St
Warren St
Center St
Park St
Abbott St
Auburn St
Liberty Ave
Vernon St
Sherman Pl
Ingalls St
Buttaro Rd
Bow St
Mill St
Lynn St
George Ave
Cedar St
North St
Riffe Range Rd
Lillian St
Hinerton Rd
Wildwood Ave
Forest Park Rd
Brentwood Rd
Hart Pl
Hart St
Hamilton Rd
Park Dr
Brae Cir
Murray Rd
Colonial Rd
Quimby Ave
Sheridan St
Shield St
Elijah St
Houghton St
Rock St
Old Farm Rd
Willow St
Morrow Dr
Marlboro Rd
Kennedy Rd
Thornton St
Brandt Dr
Heritage Way
Thistle Rd
Burlington St
Given Dr
Randall Dr
Manor Ave
Wyman St
Mountain Rd
Sylvester Rd
Newbridge Ave
Hampden Ave
Harriett Ave
Winnmere Ave
Glen Ave
Beacon St
Sylvan Rd
Peach Orchard Rd
Pearl St
Webster St
Poole St
Winter St
Milan Ave
Merrimac St
New Boston St
6th Rd
Gill St
West St
South St
Howard St
Scotland Rd
Oak St
Wescroft Rd
Avalon Rd
Pine Ridge Rd
Northern Expy
Drury Ln
Evans Rd
Pento Rd
Elizabeth Rd
Danby Rd
Aberjona
37C
37B
37A
93
95
38
35
36

SECTION 013200

PROJECT MEETINGS

PART 1 GENERAL

1.01 PRE-CONSTRUCTION MEETING

A. Prior to the start of construction there will be a project meeting to discuss methods of construction and completion of the project.

B. Representatives of the following shall be required to attend this meeting:

1. Owner
2. Owner's Project Manager
3. Architect
4. General Contractor
5. Applicable Municipal Agencies

C. Contractor shall make specified pre-construction submissions including the following, if not already submitted:

1. Type list of sub-contractors, with addresses and telephone numbers, and name of principal contract.
2. Certificates of insurance.
3. Performance and labor and material payment bonds.
4. Construction schedule.
5. Schedule of values.

D. Agenda will include the following items:

1. Tentative construction schedule.
2. Critical work sequencing and long-lead items.
3. Major equipment deliveries and priorities.
4. Designation of responsible personnel.
5. Submittal of shop drawings, project data, and samples.
6. Processing applications for payment.
7. Procedures for maintenance of record documents.
8. Procedure for field changes, RFIs, change estimates, change orders, and other CA documents.

9. Use of premises and existing buildings.
10. Location and maintenance of temporary storage buildings, field offices, and other temporary structures.
11. Lines of communication.
12. Work restrictions and working hours.
13. Owner's occupancy requirements.
14. Responsibility for temporary facilities and controls.
15. Procedures for disruptions and shutdowns.
16. Parking availability.
17. Equipment deliveries and priorities.
18. Site security procedures.

1.02 PROGRESS MEETINGS

A. Conduct weekly meetings at the site of the work during the course of the Contract. The dates of such meetings shall be as mutually agreed upon between the General Contractor, the Architect, and the Owner's Project Manager.

B. Project meetings shall be chaired by the Architect. The agenda will include the following:

1. Review approved minutes of previous meeting; insert corrections and comments.
2. Review work progress since last meeting.
3. Note field observations, problems, and decisions.
4. Identify problems which impede planned progress.
5. Plan progress during next work period.
6. Include 2-week look-ahead/look-back schedule for discussion at each meeting.
7. Review submittal logs and schedules; expedite as required to maintain schedule.
8. Deliveries.
9. Access.
10. Site utilization.
11. Temporary facilities and controls, including stormwater controls.
12. Cleanliness of city streets and dust control.
13. Maintenance of quality and work standards.

14. Field observations.
15. Status of RFIs.
16. Status of Proposal Requests, Proposed Change Orders, Construction Change Directives and Change Orders.
17. Pending charges, claims and disputes.
18. Documentation of information for payment requests.
19. Review changes proposed by Owner for effect on construction schedule and completion date.
20. Complete other current business.

D. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information

END OF SECTION

SECTION 013300

SUBMITTALS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 ELECTRONIC DOCUMENT PROCEDURES REQUIREMENTS

A. Summary:

1. All documents including but not limited to shop drawing and product data submittals, RFI's, PR's, PCO's, reports, and other CA forms shall be transmitted to Architect and Owner's Project Manager in electronic (PDF) format using Submittal Exchange, Archit Tek, EADOC or an equal website service acceptable to the Architect designed specifically for transmitting submittals between construction team members.
2. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
3. The electronic document process is not intended for color samples, color charts, or physical material samples.

B. Procedures for Documents and Submittals:

1. Document Preparation - The Contractor may use any or all of the following options:
   a. Subcontractors and Suppliers provide electronic (PDF) documents to the Contractor via Submittal Exchange's website.
   b. Subcontractors and Suppliers provide paper documents to the Contractor (subject to approval of the Contractor) who electronically scans and converts to PDF format.
   c. Subcontractors and Suppliers provide paper documents to Scanning Service which electronically scans and converts to PDF format.

2. The Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.

3. The Contractor shall transmit each submittal or document to Architect using Submittal Exchange's website service.

4. Architect / Engineer review comments will be made available on the Submittal Exchange website for downloading. The Contractor will receive email notice of completed review.

5. The Contractor shall provide one (1) hard (paper) copy of all submittals to both the Superintendent and the OPM Field Representative for use at the site. Submittals shall be provided weekly at the regularly scheduled job meeting.

6. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.

7. Submit paper copies of reviewed submittals or documents at project closeout for record purposes in accordance with Section 017700 – PROJECT CLOSEOUT.

C. Additional Requirements:

1. **The cost of website submittal service vendor shall be paid in full by the Contractor and included in his bid.**

2. Training is available regarding use of website and PDF submittals.

3. Internet Service and Equipment Requirements:

a. Email address and Internet access at the Contractor's main office.

b. Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu (www.bluebeam.com), or other similar PDF review software for applying electronic stamps and comments.

1.03 SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND ADDITIONAL REQUIRED SUBMITTALS

A. Related Documents

1. Consult the individual Sections of the Specifications for the specific submittals required under those Sections and for further details and descriptions of the requirements.

2. Refer to the General Conditions and Supplementary Conditions for the Contractor's responsibilities in the reviewing, approving and submittal of shop drawings, product data and samples.

B. General Procedures for Submittals

1. The Contractor shall transmit each submittal to the Architect sufficiently in advance of performing related work or other applicable activities, so that the installation will not be delayed by processing times, including disapproval and re-submittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Architect sufficiently in advance of the work.

2. The Contractor shall transmit each submittal in a sequence which will not result in the approval having to be later modified or rescinded by reason of a subsequent submittal which should have been processed earlier or concurrently for coordination.

3. Only submittals received from and bearing the stamp of approval by the Contractor will be considered by the Architect. Submittals shall be accompanied by a transmittal notice stating name of project, date of submittal, "To", "From", (Contractor, Subcontractor, Installer, Manufacturer, Supplier), Specification Section and paragraph number, or Drawing Number to which the submittal refers, purpose of submittal (first submittal, re-submittal), description, remarks, distribution record, signature of transmitter.

4. On the transmittal, or on a separate sheet attached to the transmittal, the Contractor shall direct attention to any deviations including minor limitations and variations, from the requirements of the Contract Documents. Deviation shall be highlighted on the submittals.

5. All costs for printing, preparing, packaging, submitting, resubmitting and mailing or delivering submittals specified in this Section shall be included in the Contractor's Bid Price.

C. Architect's Action

The Architect will review the Contractor's submittal and return them with one of the following actions recorded thereon by appropriate markings:

1. Final Unrestricted Release: Where marked "Approved as Submitted" or “Revised, no exceptions taken” the work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents. Acceptance of the work will depend upon that compliance.

2. Final-But-Restricted Release: When marked "Approved as Noted", “Approved with comments”, “Reviewed - Make corrections noted”, “Reviewed - Note markings/comments attached,” the work covered by the submittal may proceed provided it complies with the Architect's notations or corrections on the submittal, and complies with the requirements of the

Contract Documents. Acceptance of the work will depend upon these compliances.

3. Returned for Resubmittal: When marked “Revise and Resubmit,” or "Not Approved," the work covered by the submittal (purchasing, fabrication, delivery or other activity) should not proceed. The submittal should be revised or a new submittal resubmitted without delay, in accordance with the Architect's notations stating the reasons for returning the submittal.

4. No claim for extension of time shall be allowed on account of failure of the Architect to return shop drawings or samples until 15 working days after receipt by the Architect by registered or certified mail of written demand for such, and not then unless such claim be reasonable. Refer to General and Supplementary Conditions.

D. Submission of Shop Drawings

1. Shop Drawings shall be complete, give all information necessary or requested in the individual Sections of the Specifications, and also show adjoining work and details of connection thereto.

2. Shop Drawings shall be for whole systems. Partial submissions will not be accepted.

3. The Architect reserves the right to review and approve Shop Drawings only after approval of related Product Data and Samples.

4. Shop Drawings shall be properly identified and contain name of Project, name of firm submitting the Shop Drawings, Shop Drawing number, date of Shop Drawing and of revisions. Contractor's stamp of approval and sufficient spaces near the title block for the Architect's stamp.

5. The Contractor shall submit to the Architect one electronic copy of each Shop Drawing. Each submittal shall be accompanied by transmittal notice.

6. When the submittal is electronically returned by the Architect with stamp "Revise and Resubmit" or "Not Approved" the Contractor shall correct the original drawing or prepare a new drawing and resubmit an electronic copy thereof to the Architect for approval. This procedure shall be repeated until the Architect's approval is obtained. Unless written notice has been given, the Architect's approval of a resubmitted shop drawing, product data, sample, of similar submittal shall not constitute approval of any changes not requested on the prior submittal.

7. When the submittal is electronically returned by the Architect with the stamp "Approved as Submitted" or “Revised, no exceptions taken” or "Approved as Noted", “Approved with comments”, “Reviewed - Make corrections noted”, “Reviewed - Note markings/comments attached,” the Contractor shall provide and distribute such number of prints thereof as required for his own and his subcontractors' use.

E. Submission of Product Data

1. The Contractor shall submit to the Architect electronically copies of Product Data. All such data shall be as specified in the applicable SECTION and as specified herein. Identification of the specific material or equipment being submitted shall be clearly made in ink. Data of general nature will not be accepted.
2. Product Data shall include complete information of materials, dimensions, recommended applications, available options, complete color range (where product is exposed to view), name and address of manufacturer, installation instructions and any other data as required to determine acceptability of the product and compliance with the Contract Documents.
3. Product Data shall be accompanied by transmittal notice. The Contractor's stamp of approval shall appear on the printed information itself, in a location which will not mar legibility.
4. Product Data electronically returned by the Architect with the stamp "Not Approved," shall be resubmitted until the Architect's approval is obtained.
5. When the Product Data are acceptable, the Architect will stamp them "Approved as Submitted" or “Revised, no exceptions taken” or "Approved as Noted", “Approved with comments”, “Reviewed - Make corrections noted”, “Reviewed - Note markings/comments attached,” and return electronically to the Contractor. The Contractor shall provide and distribute such number of additional copies as required for his own and his subcontractors' use.

F. Submission of Samples

1. Unless otherwise specified in the individual Section, the Contractor shall submit two specimens of each sample.
2. Samples shall be of adequate size to permit proper evaluation of materials.
3. Samples which can be conveniently mailed shall be sent directly to the Architect, accompanied by transmittal notice. On the transmittal notice the Contractor shall stamp his approval of Samples submitted.
4. All other Samples shall be delivered at the field office of the Project Representative with Sample identification tag attached and properly filled in. Transmittal notice of Samples so delivered with the Contractor's stamp of approval, shall be mailed to the Architect.
5. If Sample is rejected by the Architect, a new sample all be resubmitted in the manner specified herein above. This procedure shall be repeated until sample is approved in writing by the Architect.

6. Samples will not be returned unless return is requested at the time of submission. The right is reserved to require submission of samples whether or not particular mention thereof is made in the Specifications.

1.04 SUBMITTAL SCHEDULE

A. The Contractor shall submit within fifteen (15) days of the award of the contract a Submittal Schedule in the form of a Bar Graph. The Contractor shall update the Submittal Schedule weekly and submit with each requisition for payment. The Submittal Schedule shall identify by date by which the submittals are required under each section of the specification.

B. The Submittal Schedule shall relate to the orderly progress of work with critical dates indicated for review to maintain delivery of materials.

C. Failure of the Contractor adhering to the agreed upon Submittal Schedule, may be considered by the Architect in reviewing the progress of the work, for processing of approving payment applications, or evaluating claims for delay or additional costs.

D. The Submittal Schedule shall be updated weekly and tracked using computerized tracking software.

1.05 DOCUMENTS AND SAMPLES AT THE SITE

A. The General Contractor shall maintain at the site for the Owner one record copy of all drawings, specifications, addenda, change orders and other modifications, in good order and marked currently to record all changes made during construction, and approved shop drawings, product data and samples. These shall be available to the Architect and shall be delivered to him for the Owner upon completion of the work.

1.06 PROGRESS SCHEDULE

A. At least 10 working days prior to the first Application for Payment, the Contractor shall submit to the Architect a progress schedule showing the percentage completion to be obtained and the total dollar value to be completed as of the first of each month until Substantial Completion, for each class of work included in the Schedule of Values.

1.07 SCHEDULE OF VALUES

A. Prior to the first request for payment the General Contractor shall submit to the Architect and the Owner a Schedule of Values of the various portion of the work including quantities when requested, aggregating the total contract sum and divided so as to facilitate payments for work under each SECTION. The Schedule shall be prepared in such form as specified or as the Architect or the Owner may approve, and it shall include data to substantiate its accuracy. Each item in the Schedule of Values shall be used as a basis for review and approval of the Contractor's requests for payment.

1. The Schedule of Values shall be broken down with as a minimum both labor and material line items and of sufficient detail to be able to properly and accurately review as determined by the Architect.

2. A separate line item shall be provided for record drawings and closeout documents.

1.08 REQUESTS FOR INFORMATION ("RFI")

A. The Contractor may submit requests for information to the Architect to help facilitate the Contractor's performance of the Contract. Prior to submitting each request for information, the Contractor shall first carefully study and compare the Contract Documents, field conditions, other Owner provided information, Contractor prepared Coordination Drawings, and prior Project correspondence and documentation to determine that the information to be requested is not reasonably obtainable from such sources.

B. Each request for information shall be submitted to the Architect, in writing, on such form and with such accompanying information as the Architect may require for such purpose. Each request for information shall identify the specific sources which were reviewed by the Contractor in its efforts to determine that information requested, and a statement to the effect that the information being requested could not be determined from such sources.

C. The Contractor shall submit each request for information sufficiently in advance of the date by which such information is required in order to allow the Architect sufficient time, in the Architect's professional judgment, to permit adequate review and response and to permit Contractor compliance with the latest construction schedule.

D. The Contractor shall maintain a log at the Project site that sequentially numbers and lists each request for information. This log shall also contain the Drawing(s) reference and Specification section to which the request pertains, the date of the request, to whom the request was made, by whom the request was made, the nature of the request, and the Architect's resolution thereof. This log shall be reviewed at each Project meeting and the resolution of requests for information shall be made part of the minutes of such meetings.

E. The Architect may return to the contractor any request for information that does not meet the above criteria with that requests' deficiencies noted instead of providing a detailed response.

END OF SECTION

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

C. The Contractor shall be responsible for providing and maintaining all temporary facilities until Substantial Completion. Removal of such prior to Substantial Completion must be with the concurrence of the Architect. The Contractor bears full responsibility for re-providing any facility removed prior to Substantial Completion if required for the Work.

D. Removal of all temporary facilities (excluding the construction fencing) shall be condition precedent to Substantial Completion unless directed otherwise by the Architect or specifically noted in the Specifications. Refer to Article 1.06 – construction fencing for additional requirements

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all of the Contract Documents for requirements which affect the Work of this Section.

B. Nothing in this Section is intended to limit types and amounts of temporary Work required, and no omission from this Section will be recognized as an indication by the Architect that such temporary activity is not required for successful completion of the Work or compliance with requirements of the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Provide and maintain all temporary facilities in compliance with governing rules, regulations, codes, ordinances and laws of agencies and utility companies having jurisdiction over Work involved in the project.

B. Be responsible for all temporary Work provided, and obtain any necessary permits and inspections for such Work.

C. Do not interfere with normal use of streets in vicinity of project site except as absolutely necessary to execute required Work, and then only after proper arrangement has been made with applicable authorities, including traffic control.

1.04 JOB CONDITIONS

A. Install, operate, maintain, and protect temporary facilities in a manner and at locations which will be safe, non- hazardous, sanitary and protective of persons and property, and free of deleterious effects.

B. Notify the Owner, Architect, and other affected parties no less than 10 days in advance of shutting down, starting up, interrupting utilities or service of facilities which may affect the neighboring homes or businesses. Allow sufficient time for protective measures to be taken.

1.05 TEMPORARY WATER AND ELECTRICITY

A. The General Contractor be responsible for providing his/her own water and electrical power. No existing water or power exists on site.

B. General Contractor shall provide an adequate supply of cool drinking water, from approved sources of acceptable quality, satisfactorily cooled, for his employees and those of his subcontractors. Individual drinking cups shall be provided for all personnel on the job.

D. At the completion of this contract, the General Contractor shall remove all of the temporary water and electrical distribution systems.

1.06 CONSTRUCTION FENCING

A. **CONSTRUCTION FENCING SHALL BE FURNISHED AND INSTALLED AS SHOWN ON THE DRAWINGS AND UPON COMPLETION OF THE WORK SHALL REMAIN THE PROPERTY OF THE CITY OF WOBURN.**

B. Construction Fencing:

1. The Contractor shall be responsible for providing construction fencing around the Work areas of the site as shown on the drawings. Fencing shall be in sections 6 feet high by 10 feet long with top and bottom rails. Gate panels shall also have intermediate rails with diagonal bracing. Posts shall be driven except along Main Street which shall be movable. Movable post supports shall be furnished with precast concrete stanchions to allow fence sections to be relocated during phases of the Work. The fencing shall include single and double leaf gates as shown on the drawings. The fencing shall enclose the entire limit of work areas as designated on the drawings. Fencing shall be maintained in an orderly condition until Substantial Completion at which time the Owner will take possession of the fencing and be responsible for its maintenance.

1.07 BARRIERS

A. Tree and Plant Protection

1. Existing trees and shrubs within the Limit of Work lines which are to remain shall at all times be protected against any possible injury during the progress of the Work.

2. The trunk and exposed roots of trees within the Limit of Work lines shall be thoroughly protected with suitable temporary guards and barriers and the branches shall not be injured by the operation of power equipment or other material devices.

B. Siltation Control Barriers

1. Prior to the commencement of any site work, temporary siltation control barriers shall be installed as shown on the Drawings, and specified under SECTION 311000-SITE PREPARATION, SECTION 312000-EARTHWORK and SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS.

1.08 DUST CONTROL

A. Provide and maintain throughout the conduct of the Work of this Contract, the following measures necessary, as a minimum, to control and reduce emission of airborne dust, and prevent contamination of exterior surfaces at adjacent public and private properties, or otherwise creating a nuisance to the Owner or adjacent properties.

1. Sufficiently wet construction materials with a fine spray or sprinkling of water during removal, cutting or other handling to reduce the emission of airborne dust.

2. Street sweeping the project site entry to maintain all areas clean and free of dirt, mud, and debris at all times.

3. The above minimum measures notwithstanding, it shall be the Contractor's responsibility to utilize whatever means and methods the Contractor deems necessary to prevent the emission of airborne dust off the project site. The Contractor shall include the cost to comply with the above requirements in a separate line item included in the Schedule of Values provided in accordance with the Contract Documents.

1.09 DISPOSAL OF DEBRIS

A. Debris shall not be permitted to accumulate and the work shall at all times be kept satisfactorily clean.

B. Remove debris from site in accordance with the time specified in SECTION 311000-SITE PREPARATION.

1.10 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide and service an adequate number of chemical type toilet booths and hand washing stations

B. The toilets and hand washing stations shall be erected in location approved by the Architect and shall be maintained by the Contractor in a clean and orderly condition in compliance with all local and state health requirements, including COVID 19 protocols.

1.11 PROTECTION OF PERSONS AND PROPERTY

A. The General Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work.

B. The General Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

1. All employees on the Work and all other persons who may be affected thereby.

2. All 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 his Subcontractors or Sub-subcontractors.

3. Any other property at the site or adjacent thereto, including (but not limited to) equipment, existing construction to remain, trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of the Work. Restore to original condition or replace any property on and/or off the site which may be damaged or destroyed in the execution of the Work.

1.12 ACCESS ROADS

A. Traffic and Hauling Plan: Submit a detailed hauling plan; indicate trucking routes, schedules, timing, and types of vehicles to be received and accepted by the City of Woburn's municipal departments. See SECTION 013100-PROJECT PROCEDURES for Construction Vehicle Transportation Routes.

B. Temporary Use of Permanent Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.

2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to SECTION 312000 - EARTHWORK.

3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.

C. Use of Public Roads: Comply with the requirements of the City of Woburn for use of public roads for trucking related to earth moving. Prepare a hauling plan for approval of the City of Woburn, and obtain necessary permits if required.

1. Provide street sweeping of public roads where construction traffic has left dust and debris on road surface.

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Maintain access for fire-fighting equipment.

E. Traffic Signs: Provide and maintain temporary signs and personnel, as required to direct and maintain an orderly flow of traffic in areas affected by Contractor's operations, including but not limited to, haul routes, site entrances, and on-site parking areas.

1. Traffic Control Signs: At free standing locations, provide post signs with breakaway post assemblies conforming to applicable provisions of the Massachusetts Department of Transportation "Standard Specifications."

2. Sign Sizes/Text: Include in the Contract Price a quantity of five (5) metal signs and metal posts, average size of 600 square inches with a minimum of 20 characters per sign. Where appropriate signs may be mounted on construction fencing. Specific signage requirements will be reviewed at the Pre-Construction Meeting.

1.13 TEMPORARY PROTECTION

A. After performing the Work of this Contract, the Contractor shall be responsible for repairing, replacing or cleaning any such work which has been damaged by other Trades or construction personnel, so that all Work is in perfect condition at the time of Substantial Completion.

1.14 FIRE PROTECTION AND PREVENTION

A. Applicable Standards: Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."

B. No open fires will be permitted in or about premises.

1.15 ACCIDENT PREVENTION

A. Comply with all recommendations and requirements for accident prevention of the Associates, General Contractors of America and the American Standards Association Standard A10.2. The Field Superintendent of the General Contractor shall conduct regular and frequent inspections of the site for compliance with safety regulations, stating in writing to the Architect each month that he has done so. The Architect specifically reserves the right to direct and enforce compliance with safety regulations if conditions on the site do not comply.

B. Neither the Owner nor the Architect shall be responsible for providing a safe working place for the General Contractor, Subcontractors or their employees or any individual responsible to them for the work.

1.16 BLASTING

A. Refer to SECTION 312319 CONTROLLED BLASTING.

1.17 SNOW AND ICE REMOVAL

A. The General Contractor shall remove all snow and ice within the Limit of Work lines which may impede the work, damage materials, be detrimental to workmen, or impede trucking, delivery, or moving of materials at the job site, or prevent adequate drainage of the site or adjoining areas.

1.18 WINTER CONSTRUCTION

A. The General Contractor shall be responsible for providing protection against damage to materials and work installed in freezing weather in a manner approved by the Architect.

1.19 WIND PROTECTION

A. Should high wind warnings be issued by the U.S. Weather Bureau, the Contractor shall take every precaution to minimize danger to persons, to the work, and to adjacent property.

1.20 NOISE AND POLLUTION CONTROL

A. All work performed under the Contract shall conform to the requirements of Chapter 11, Section 31C and Section 142D of the General Laws, and Rules and Regulations adopted thereto by the Commonwealth of Massachusetts, Department of Public Health.

B. In addition, all work shall comply with **City of Woburn** regulations for the control of noise including activities on construction sites.

1.21 SITE DRAINAGE AND PUMPING

A. The General Contractor shall be responsible for maintaining site drainage within the Limit of Work Lines upon entering the premises and shall maintain such drainage during the life of his Contract in a manner approved by the Architect and so as not to adversely affect the adjacent areas.

1.22 HOURS OF OPERATION

A. Refer to SECTION 013100-PROJECT PROCEDURES

1.23 TEMPORARY OFFICES

A. Field Offices, General: Provide prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading. Subcontractors shall provide field offices for their own use.

B. General Contractor's Field Offices: Provide insulated, weather-tight temporary offices of sufficient size to accommodate required office personnel and site meetings at Project site. Keep the office clean and orderly for use for progress meetings.

1. Install field office within ten (10) days of receipt of the Notice to Proceed and maintain for duration of Project.
2. Housekeeping: Provide reliable weekly cleaning service meeting Covid 19 protocols for duration of Project. Provide covered waste containers for used material.

C. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.

D. Owner's Site Office: The Owner's Project Manager and On-Site Representative will have an office located in a city owned building off site.

E. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

F. Waste Disposal Facilities: Comply with requirements specified in SECTION - 017419 "Construction Waste Management and Disposal."

G. Furnishings and Equipment: The furniture and equipment for the OPM’s site office will be provided by the Owner.

1.24 TEMPORARY TELEPHONE

A. Telephone Service for General Contractor: Provide superintendent with cellular telephone. Superintendent shall carry telephone or radio at all times while on site.

1.25 RODENT AND PEST CONTROL

A. Before beginning site clearing and grubbing operations, retain a recognized local exterminator or insect-and-pest control company to recommend practices that will minimize attraction and harboring of rodents, roaches and other pests.

B. Employ control service to perform extermination and control procedures at regular intervals so that the project will be relatively free of pests and their residues at Substantial Completion.

C. Perform control operations in a lawful manner using environmentally safe materials.

END OF SECTION

SECTION 017419

CONSTRUCTION WASTE MANAGEMENT

PART 1 GENERAL

1.01 PROVISIONS INCLUDED

A. The Conditions of the Contract and Division 1, General Requirements, apply to the work under this Section.

B. Attention of the Contractor and this Subcontractor is drawn to provisions of the Contract Documents regarding the responsibility of all bidders to visit and inspect the site, including the existing building, and to base all bids on conclusions drawn from such inspections.

1.02 SCOPE OF WORK

A. This Section specifies administrative and procedural requirements for the Contractor's implementation of waste management controls and systems for the duration of the Work.

B. Develop and implement a waste management plan consistent with the requirements of LEED v4 MR prerequisite Construction and Demolition Waste Management Planning and MR credit Construction and Demolition Waste Management.

1.03 INTENT

A. While the project will not be registered with the USGBC, The Owner and Architect have established that this project shall generate the least amount of waste practical and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed.

B. Of the waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized to the greatest extent practical.

C. With regard to these goals the Contractor shall develop, for the Architect's review, a Waste Management Plan for this project.

1. Each Subcontractor shall be responsible for segregating his own waste into different dumpsters as directed by the Contractor. OR C + D waste materials will be collected on site in commingled containers and sorted off site.

2. Contractor shall be responsible for ensuring that debris will be disposed of at appropriately designated licensed solid waste disposal facilities, as defined by MGL Chapter 111, Section 150A.

1.04 SUBMITTALS

A. Waste Management Plan: Within 14 calendar days after receipt of Notice to Proceed, the Contractor shall provide a compliant Construction Waste Management Plan including:

1. Identify materials target for diversion. Determine and document the estimated percentage of the overall waste that these materials represent. 75% minimum diversion rate REQUIRED.
2. Diverted materials must include at least four material streams.
3. Document if these materials will be site separated or commingled and sorted off site.
4. Describe the diversion strategies.
5. Identify the locations as to where the materials will be taken including recycling facilities, sorting facilities and landfills. Include the following:
    a. Landfill Options: The name of the landfills where the non-recyclable Construction and Demolition waste will be taken to be disposed of, applicable tipping fees and the projected cost of disposing of the Project waste in landfills
    b. Off-Site Sorting: The name of off-site sorting facilities to receive commingled demolition and construction debris collected in mixed materials containers on site.
    c. If sorted off site, identify the sorting facilities and how the materials will be processed.
6. NOTE: Excavated soil, land-clearing debris, and alternative daily cover (ADC) do not contribute to this credit.

B. Landfill Certification: Provide a statement of verification that the landfills proposed for use are licensed for types of waste to be deposited and have sufficient capacity to receive the estimated waste from this project

C. For co-mingled materials collected in mixed containers on site and sorted off-site the following documentation must be provided:

1. For each container: A detailed breakdown of the weight of each material after sorting, including materials diverted to landfills
2. AND/OR provide the sorting facilities annual average recycling rate for EACH facility where off-site sorting takes place. Additionally, provide documentation that the facility is State regulated.

D. Recycled, and Salvaged Materials: Provide a list of each material proposed to be recycled, salvaged or diverted from landfill during the course of the Project. Include a minimum of five of the following and any additional items:

1. Cardboard and paper
2. Clean dimensional Wood (free from nails and screws, etc)
3. Concrete and slurry wall materials
4. Asphalt
5. Metals including banding.
6. Glass
7. Packing materials
8. Beverage Containers

E. Meetings: A description of the regular meetings to be held to address waste management.

F. Procedures for Materials Handling: Provide a description of the means by which any waste materials and/or collection containers identified above will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.

G. Transportation: Provide a description of the means of transportation of the recyclable materials identify if materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site for off-site sorting

H. Waste Management Progress Reports to be submitted concurrent with each monthly Application for Payment. Provide a written Waste Management Progress Report and updated tracking spreadsheet

I. Waste Management Final Report: Prior to Substantial Completion, submit a written Waste Management Final Report summarizing the types and quantities of materials recycled and disposed of under the Waste Management Plan. Include the name and location of disposal facilities. Quantity may be measured by either weight or volume; be consistent in calculations. Include the following:\

1. Material category.
2. Generation point of waste.
3. Total quantity of waste, by weight.
4. Quantity of waste salvaged, both estimated and actual.
5. Quantity of waste recycled, both estimated and actual.

6. Total quantity of waste recovered (salvaged plus recycled).

7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

J. Other Submittals:

1. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

2. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

3. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

4. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.05 CONTRACTORS

A. Contractor may subcontract work of this Section to a sub-contractor specializing in recycling and salvaging of construction waste.

1. Institution Recycling Network, 7 South State Street, Suite 2, Concord, NH 03301; tel. 866-229-1962

2. Waste Solutions, Inc., 965 Plain Street, Marshfield, MA 02050; tel. 781-844-1476

3. Eco-One Solutions, 18 Glenwood Street, Natick MA, 01760; tel. 978.270.8950

4. Or equal as approved by the Architect.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 RECYCLING

A. Metal, including but not limited to aluminum stairs, structural beams and sections, and reinforcing steel shall be recycled.

B. Wood that is not painted and does not contain preservatives (i.e. creosote, arsenic, and chromium-containing preservatives) shall be segregated and recycled.

C. Refer to the Massachusetts Recycling Directory available at the Massachusetts State Bookstore (617-727-2834) in the State Capitol Building for recycling operations within the State.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: The Contractor shall designate an on-site person responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the Project

B. Distribution: The Contractor shall distribute copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor, the Owner and the Architect.

C. Instruction: The Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project

D. Separation Facilities: The Contractor shall lay out and label a specific area to facilitate separation of materials for recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials. Location shall be acceptable to the Architect.

E. Hazardous Wastes: Any unforeseen hazardous wastes shall be separated, stored, and disposed of according to local regulations and as directed by the Owner.

END OF SECTION

SECTION 017700

PROJECT CLOSEOUT

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 CLEANING UP

A. In accordance with the General Conditions, immediately prior to the Architect's inspection for Substantial Completion, the Contractor shall completely clean the areas within the Limit of Work line and mechanically sweep roadways/drives soiled by the Work, and including the following:

1. All construction facilities, debris, and rubbish generated as a result of the Work shall be removed from the Owner's property and legally disposed of off site.

1.03 GUARANTEES

A. The work under this Contract, except as expressly excluded, and all of its subcontractors, severally and collectively, whether herein stipulated in each case or not, shall be guaranteed against faulty workmanship and/or material for a term of one year from date of substantial completion of the entire project. The provisions of the guarantee and/or guarantees shall be incumbent on all parties of the work, including the General Contractor, each Subcontractor, all material supply houses and all manufacturers whose products and/or equipment is incorporated into the project.

1.04 WARRANTIES

A. For work listed as "incomplete" at time of Substantial Completion, warranties required by the Contract Documents shall commence when such work is accepted as complete by the Architect, unless an exception is specifically made in the Certificate of Substantial Completion.

1.05 RECORD DOCUMENTS

A. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare full sets of corrected digital data files of the Contract Drawings, as follows:

1. Formats

a. The General Contractor shall obtain one set of all Project Drawings of this Section on DVDs in DWG format. The CAD files shall be on DVDs, AutoCAD Version 2006 and Windows XP compatible format or an agreeable current format. CAD Drawing files indicated on the marked up set of Record Drawings. Remove all superseded data to show the completed installation. These CAD files shall become the property of the Owner.

b. The record drawings required to be furnished under the terms of this contract are:

Section	Reference Division	Drawings Required
Site Work	31, 32	ESP-1 through ESP-5, inclusive

c. Record drawings shall be prepared by and bear the stamp of an independent professional surveyor licensed in the Commonwealth of Massachusetts.

2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.

3. Employ experienced CADD drafters to record information. Use same symbols and notations as used on original Contract Drawings. Delineate clearly, neatly, and accurately Work as it is installed.

4. Refer instances of uncertainty to Architect for resolution.

5. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.

a. Refer to SECTION 013300-SUBMITTALS for requirements related to use of Architect's digital data files.

b. Architect will provide data file layer information. Record markups in separate layers.

B. Submission of the As-Built record drawings shall be required for Substantial Completion.

END OF SECTION

SECTION 018300

MINIMUM WAGE RATES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The listing of CLASSIFICATIONS AND MINIMUM WAGE RATES as determined by the Commissioner of Labor and Industries under the provisions of Sections 27 and 27A, Chapter 149 of the General Laws as amended, are attached herewith and are hereby made a part of the Contract Documents.

B. The General Contractor and all Subcontractors shall comply with the requirements of Chapter 149 of the General Laws, Commonwealth of Massachusetts, Section 26 and 27D, inclusive, as amended.

C. It is the obligation of the General Contractor to assure that the General Contractor and all of its subcontractors comply with the requirements of the Massachusetts Prevailing Wage Law, MGL c.149 SS26-27H. The General 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 c.149 S27, and shall release, indemnify, hold harmless and defend the Owner, 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 General Contractor any subcontractor of the said Prevailing Wage Law (or, in the case of the General Contractor's defense obligation, the claimed violation thereof).

END OF SECTION

ATTACHMENT A

Massachusetts Prevailing Wage Rates

EARLY SITE PREPARATION
WOBURN FIRE HEADQUARTERS
MINIMUM WAGE RATES
018300

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

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

ROSALIN ACOSTA
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: City of Woburn

Contract Number:

City/Town: WOBURN

Description of Work: Early Site Prep Work, City of Woburn Fire Department

Job Location: Woburn Mass

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 criminal penalties.

Issue Date: 06/01/2020 **Wage Request Number:** 20200601-046

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	06/01/2020	$36.25	$12.41	$13.72	$0.00	$62.38
	08/01/2020	$36.25	$12.91	$13.72	$0.00	$62.88
	12/01/2020	$36.25	$12.91	$14.82	$0.00	$63.98
	06/01/2021	$37.05	$12.91	$14.82	$0.00	$64.78
	08/01/2021	$37.05	$13.41	$14.82	$0.00	$65.28
	12/01/2021	$37.05	$13.41	$16.01	$0.00	$66.47
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	06/01/2020	$36.32	$12.41	$13.72	$0.00	$62.45
	08/01/2020	$36.32	$12.91	$13.72	$0.00	$62.95
	12/01/2020	$36.32	$12.91	$14.82	$0.00	$64.05
	06/01/2021	$37.12	$12.91	$14.82	$0.00	$64.85
	08/01/2021	$37.12	$13.41	$14.82	$0.00	$65.35
	12/01/2021	$37.12	$13.41	$16.01	$0.00	$66.54
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	06/01/2020	$36.44	$12.41	$13.72	$0.00	$62.57
	08/01/2020	$36.44	$12.91	$13.72	$0.00	$63.07
	12/01/2020	$36.44	$12.91	$14.82	$0.00	$64.17
	06/01/2021	$37.24	$12.91	$14.82	$0.00	$64.97
	08/01/2021	$37.24	$13.41	$14.82	$0.00	$65.47
	12/01/2021	$37.24	$13.41	$16.01	$0.00	$66.66
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2019	$102.78	$9.90	$21.15	$0.00	$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 1*	06/01/2020	$39.90	$8.60	$17.09	$0.00	$65.59
	12/01/2020	$40.88	$8.60	$17.09	$0.00	$66.57
	06/01/2021	$41.90	$8.60	$17.09	$0.00	$67.59
	12/01/2021	$42.91	$8.60	$17.09	$0.00	$68.60
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	06/01/2020	$38.00	$12.50	$8.85	$0.00	$59.35
	12/01/2020	$39.00	$12.50	$8.85	$0.00	$60.35
ASPHALT RAKER *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.83	$12.50	$15.70	$0.00	$78.03
	12/01/2020	$50.98	$12.50	$15.70	$0.00	$79.18
	06/01/2021	$52.08	$12.50	$15.70	$0.00	$80.28
	12/01/2021	$53.23	$12.50	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.83	$12.50	$15.70	$0.00	$78.03
	12/01/2020	$50.98	$12.50	$15.70	$0.00	$79.18
	06/01/2021	$52.08	$12.50	$15.70	$0.00	$80.28
	12/01/2021	$53.23	$12.50	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 1*	06/01/2020	$39.90	$8.60	$17.09	$0.00	$65.59
	12/01/2020	$40.88	$8.60	$17.09	$0.00	$66.57
	06/01/2021	$41.90	$8.60	$17.09	$0.00	$67.59
	12/01/2021	$42.91	$8.60	$17.09	$0.00	$68.60
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2020	$46.10	$7.07	$17.98	$0.00	$71.15

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$29.97	$7.07	$11.69	$0.00	$48.73
2	65	$29.97	$7.07	$11.69	$0.00	$48.73
3	70	$32.27	$7.07	$12.59	$0.00	$51.93
4	75	$34.58	$7.07	$13.49	$0.00	$55.14
5	80	$36.88	$7.07	$14.38	$0.00	$58.33
6	85	$39.19	$7.07	$15.29	$0.00	$61.55
7	90	$41.49	$7.07	$16.18	$0.00	$64.74
8	95	$43.80	$7.07	$17.09	$0.00	$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (WALTHAM)*	02/01/2020	$54.40	$10.75	$21.94	$0.00	$87.09
	08/01/2020	$55.75	$10.75	$22.09	$0.00	$88.59
	02/01/2021	$56.39	$10.75	$22.09	$0.00	$89.23
	08/01/2021	$57.79	$10.75	$22.25	$0.00	$90.79
	02/01/2022	$58.38	$10.75	$22.25	$0.00	$91.38

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.20	$10.75	$21.94	$0.00	$59.89
2	60	$32.64	$10.75	$21.94	$0.00	$65.33
3	70	$38.08	$10.75	$21.94	$0.00	$70.77
4	80	$43.52	$10.75	$21.94	$0.00	$76.21
5	90	$48.96	$10.75	$21.94	$0.00	$81.65

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.88	$10.75	$22.09	$0.00	$60.72
2	60	$33.45	$10.75	$22.09	$0.00	$66.29
3	70	$39.03	$10.75	$22.09	$0.00	$71.87
4	80	$44.60	$10.75	$22.09	$0.00	$77.44
5	90	$50.18	$10.75	$22.09	$0.00	$83.02

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$40.30	$8.60	$17.24	$0.00	$66.14
	12/01/2020	$41.28	$8.60	$17.24	$0.00	$67.12
	06/01/2021	$42.30	$8.60	$17.24	$0.00	$68.14
	12/01/2021	$43.31	$8.60	$17.24	$0.00	$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2020	$42.50	$9.40	$18.95	$0.00	$70.85
	09/01/2020	$43.15	$9.40	$18.95	$0.00	$71.50
	03/01/2021	$43.75	$9.40	$18.95	$0.00	$72.10
	09/01/2021	$44.40	$9.40	$18.95	$0.00	$72.75
	03/01/2022	$45.00	$9.40	$18.95	$0.00	$73.35
	09/01/2022	$45.65	$9.40	$18.95	$0.00	$74.00
	03/01/2023	$46.25	$9.40	$18.95	$0.00	$74.60

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.25	$9.40	$1.73	$0.00	$32.38
2	60	$25.50	$9.40	$1.73	$0.00	$36.63
3	70	$29.75	$9.40	$13.76	$0.00	$52.91
4	75	$31.88	$9.40	$13.76	$0.00	$55.04
5	80	$34.00	$9.40	$15.49	$0.00	$58.89
6	80	$34.00	$9.40	$15.49	$0.00	$58.89
7	90	$38.25	$9.40	$17.22	$0.00	$64.87
8	90	$38.25	$9.40	$17.22	$0.00	$64.87

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.58	$9.40	$1.73	$0.00	$32.71
2	60	$25.89	$9.40	$1.73	$0.00	$37.02
3	70	$30.21	$9.40	$13.76	$0.00	$53.37
4	75	$32.36	$9.40	$13.76	$0.00	$55.52
5	80	$34.52	$9.40	$15.49	$0.00	$59.41
6	80	$34.52	$9.40	$15.49	$0.00	$59.41
7	90	$38.84	$9.40	$17.22	$0.00	$65.46
8	90	$38.84	$9.40	$17.22	$0.00	$65.46

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $30.26/ 3&4 $36.18/ 5&6 $54.64/ 7&8 $60.62

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS -ZONE 2 (Wood Frame)*	10/01/2019	$27.95	$7.07	$7.86	$0.00	$42.88

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 10/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$16.77	$7.07	$0.00	$0.00	$23.84
2	60	$16.77	$7.07	$0.00	$0.00	$23.84
3	65	$18.17	$7.07	$7.86	$0.00	$33.10
4	70	$19.57	$7.07	$7.86	$0.00	$34.50
5	75	$20.96	$7.07	$7.86	$0.00	$35.89
6	80	$22.36	$7.07	$7.86	$0.00	$37.29
7	85	$23.76	$7.07	$7.86	$0.00	$38.69
8	90	$25.16	$7.07	$7.86	$0.00	$40.09

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $19.65/ 3&4 $27.19/ 5&6 $34.50/ 7&8 $37.29

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (WALTHAM)*	01/01/2020	$49.07	$12.75	$22.41	$0.62	$84.85

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

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.54	$12.75	$15.41	$0.00	$52.70
2	60	$29.44	$12.75	$17.41	$0.62	$60.22
3	65	$31.90	$12.75	$18.41	$0.62	$63.68
4	70	$34.35	$12.75	$19.41	$0.62	$67.13
5	75	$36.80	$12.75	$20.41	$0.62	$70.58
6	80	$39.26	$12.75	$21.41	$0.62	$74.04
7	90	$44.16	$12.75	$22.41	$0.62	$79.94

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 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10

For apprentice rates see "Apprentice- LABORER"

CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$50.83	$12.50	$15.70	$0.00	$79.03
	12/01/2020	$51.98	$12.50	$15.70	$0.00	$80.18
	06/01/2021	$53.08	$12.50	$15.70	$0.00	$81.28
	12/01/2021	$54.23	$12.50	$15.70	$0.00	$82.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$33.22	$12.50	$15.70	$0.00	$61.42
	12/01/2020	$34.00	$12.50	$15.70	$0.00	$62.20
	06/01/2021	$34.75	$12.50	$15.70	$0.00	$62.95
	12/01/2021	$35.54	$12.50	$15.70	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2020	$50.96	$8.20	$22.10	$0.00	$81.26
	07/01/2020	$51.51	$8.25	$22.40	$0.00	$82.16
	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.48	$8.20	$0.00	$0.00	$33.68
2	55	$28.03	$8.20	$5.94	$0.00	$42.17
3	60	$30.58	$8.20	$6.48	$0.00	$45.26
4	65	$33.12	$8.20	$7.02	$0.00	$48.34
5	70	$35.67	$8.20	$18.86	$0.00	$62.73
6	75	$38.22	$8.20	$19.40	$0.00	$65.82
7	80	$40.77	$8.20	$19.94	$0.00	$68.91
8	90	$45.86	$8.20	$21.02	$0.00	$75.08

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.76	$8.25	$0.00	$0.00	$34.01
2	55	$28.33	$8.25	$6.05	$0.00	$42.63
3	60	$30.91	$8.25	$6.60	$0.00	$45.76
4	65	$33.48	$8.25	$7.15	$0.00	$48.88
5	70	$36.06	$8.25	$19.10	$0.00	$63.41
6	75	$38.63	$8.25	$19.65	$0.00	$66.53
7	80	$41.21	$8.25	$20.20	$0.00	$69.66
8	90	$46.36	$8.25	$21.30	$0.00	$75.91

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 1*	12/01/2019	$39.30	$8.10	$16.60	$0.00	$64.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 1*	12/01/2019	$40.30	$8.10	$16.60	$0.00	$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS *LABORERS - ZONE 1*	12/01/2019	$40.05	$8.10	$16.60	$0.00	$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 1*	12/01/2019	$40.30	$8.10	$16.60	$0.00	$65.00

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 1*	12/01/2019	$40.05	$8.10	$16.60	$0.00	$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 1*	12/01/2019	$39.30	$8.10	$16.60	$0.00	$64.00
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2019	$68.52	$9.90	$21.15	$0.00	$99.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2019	$48.94	$9.90	$21.15	$0.00	$79.99
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2019	$73.41	$9.90	$21.15	$0.00	$104.46
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2019	$102.78	$9.90	$21.15	$0.00	$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *ELECTRICIANS LOCAL 103*	03/01/2020	$53.50	$13.00	$19.20	$0.00	$85.70
	09/01/2020	$54.93	$13.00	$19.25	$0.00	$87.18
	03/01/2021	$56.13	$13.00	$19.28	$0.00	$88.41
	09/01/2021	$57.56	$13.00	$19.33	$0.00	$89.89
	03/01/2022	$58.76	$13.00	$19.36	$0.00	$91.12
	09/01/2022	$60.19	$13.00	$19.41	$0.00	$92.60
	03/01/2023	$61.39	$13.00	$19.44	$0.00	$93.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN *ELECTRICIANS LOCAL 103*	03/01/2020	$53.50	$13.00	$19.20	$0.00	$85.70
	09/01/2020	$54.93	$13.00	$19.25	$0.00	$87.18
	03/01/2021	$56.13	$13.00	$19.28	$0.00	$88.41
	09/01/2021	$57.56	$13.00	$19.33	$0.00	$89.89
	03/01/2022	$58.76	$13.00	$19.36	$0.00	$91.12
	09/01/2022	$60.19	$13.00	$19.41	$0.00	$92.60
	03/01/2023	$61.39	$13.00	$19.44	$0.00	$93.83

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELECTRICIAN - Local 103*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$21.40	$13.00	$0.64	$0.00	$35.04
2	40	$21.40	$13.00	$0.64	$0.00	$35.04
3	45	$24.08	$13.00	$14.62	$0.00	$51.70
4	45	$24.08	$13.00	$14.62	$0.00	$51.70
5	50	$26.75	$13.00	$15.04	$0.00	$54.79
6	55	$29.43	$13.00	$15.46	$0.00	$57.89
7	60	$32.10	$13.00	$15.87	$0.00	$60.97
8	65	$34.78	$13.00	$16.29	$0.00	$64.07
9	70	$37.45	$13.00	$16.70	$0.00	$67.15
10	75	$40.13	$13.00	$17.12	$0.00	$70.25

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$21.97	$13.00	$0.66	$0.00	$35.63
2	40	$21.97	$13.00	$0.66	$0.00	$35.63
3	45	$24.72	$13.00	$14.64	$0.00	$52.36
4	45	$24.72	$13.00	$14.64	$0.00	$52.36
5	50	$27.47	$13.00	$15.06	$0.00	$55.53
6	55	$30.21	$13.00	$15.49	$0.00	$58.70
7	60	$32.96	$13.00	$15.90	$0.00	$61.86
8	65	$35.70	$13.00	$16.32	$0.00	$65.02
9	70	$38.45	$13.00	$16.73	$0.00	$68.18
10	75	$41.20	$13.00	$17.16	$0.00	$71.36

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*	01/01/2020	$61.42	$15.73	$18.41	$0.00	$95.56
	01/01/2021	$63.47	$15.88	$19.31	$0.00	$98.66
	01/01/2022	$65.62	$16.03	$20.21	$0.00	$101.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$30.71	$15.73	$0.00	$0.00	$46.44
2	55	$33.78	$15.73	$18.41	$0.00	$67.92
3	65	$39.92	$15.73	$18.41	$0.00	$74.06
4	70	$42.99	$15.73	$18.41	$0.00	$77.13
5	80	$49.14	$15.73	$18.41	$0.00	$83.28

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.74	$15.88	$0.00	$0.00	$47.62
2	55	$34.91	$15.88	$19.31	$0.00	$70.10
3	65	$41.26	$15.88	$19.31	$0.00	$76.45
4	70	$44.43	$15.88	$19.31	$0.00	$79.62
5	80	$50.78	$15.88	$19.31	$0.00	$85.97

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*	01/01/2020	$42.99	$15.73	$18.41	$0.00	$77.13
	01/01/2021	$44.43	$15.88	$19.31	$0.00	$79.62
	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2020	$44.73	$12.50	$15.70	$0.00	$72.93
	11/01/2020	$45.73	$12.50	$15.70	$0.00	$73.93
	05/01/2021	$46.88	$12.50	$15.70	$0.00	$75.08
	11/01/2021	$47.88	$12.50	$15.70	$0.00	$76.08
	05/01/2022	$49.03	$12.50	$15.70	$0.00	$77.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2020	$46.23	$12.50	$15.70	$0.00	$74.43
	11/01/2020	$47.24	$12.50	$15.70	$0.00	$75.44
	05/01/2021	$48.40	$12.50	$15.70	$0.00	$76.60
	11/01/2021	$49.41	$12.50	$15.70	$0.00	$77.61
	05/01/2022	$50.57	$12.50	$15.70	$0.00	$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2020	$22.64	$12.50	$15.70	$0.00	$50.84
	11/01/2020	$23.23	$12.50	$15.70	$0.00	$51.43
	05/01/2021	$23.91	$12.50	$15.70	$0.00	$52.11
	11/01/2021	$24.51	$12.50	$15.70	$0.00	$52.71
	05/01/2022	$25.18	$12.50	$15.70	$0.00	$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 103*	03/01/2020	$53.50	$13.00	$19.20	$0.00	$85.70
	09/01/2020	$54.93	$13.00	$19.25	$0.00	$87.18
	03/01/2021	$56.13	$13.00	$19.28	$0.00	$88.41
	09/01/2021	$57.56	$13.00	$19.33	$0.00	$89.89
	03/01/2022	$58.76	$13.00	$19.36	$0.00	$91.12
	09/01/2022	$60.19	$13.00	$19.41	$0.00	$92.60
	03/01/2023	$61.39	$13.00	$19.44	$0.00	$93.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING*ELECTRICIANS* *LOCAL 103*	03/01/2020	$40.13	$13.00	$17.12	$0.00	$70.25
	09/01/2020	$41.20	$13.00	$17.16	$0.00	$71.36
	03/01/2021	$42.66	$13.00	$17.27	$0.00	$72.93
	09/01/2021	$44.32	$13.00	$17.38	$0.00	$74.70
	03/01/2022	$45.83	$13.00	$17.49	$0.00	$76.32
	09/01/2022	$47.55	$13.00	$17.62	$0.00	$78.17
	03/01/2023	$49.11	$13.00	$17.73	$0.00	$79.84
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$40.80	$12.50	$15.70	$0.00	$69.00
	12/01/2020	$41.75	$12.50	$15.70	$0.00	$69.95
	06/01/2021	$42.66	$12.50	$15.70	$0.00	$70.86
	12/01/2021	$43.61	$12.50	$15.70	$0.00	$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER *LABORERS - ZONE 1*	06/01/2020	$23.50	$8.60	$17.09	$0.00	$49.19
	12/01/2020	$24.50	$8.60	$17.09	$0.00	$50.19
	06/01/2021	$24.50	$8.60	$17.09	$0.00	$50.19
	12/01/2021	$24.50	$8.60	$17.09	$0.00	$50.19
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	03/01/2020	$47.05	$9.40	$19.25	$0.00	$75.70
	09/01/2020	$47.85	$9.40	$19.25	$0.00	$76.50
	03/01/2021	$48.65	$9.40	$19.25	$0.00	$77.30
	09/01/2021	$49.45	$9.40	$19.25	$0.00	$78.10
	03/01/2022	$50.25	$9.40	$19.25	$0.00	$78.90

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.53	$9.40	$1.79	$0.00	$34.72
2	55	$25.88	$9.40	$1.79	$0.00	$37.07
3	60	$28.23	$9.40	$13.88	$0.00	$51.51
4	65	$30.58	$9.40	$13.88	$0.00	$53.86
5	70	$32.94	$9.40	$15.67	$0.00	$58.01
6	75	$35.29	$9.40	$15.67	$0.00	$60.36
7	80	$37.64	$9.40	$17.46	$0.00	$64.50
8	85	$39.99	$9.40	$17.46	$0.00	$66.85

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.93	$9.40	$1.79	$0.00	$35.12
2	55	$26.32	$9.40	$1.79	$0.00	$37.51
3	60	$28.71	$9.40	$13.88	$0.00	$51.99
4	65	$31.10	$9.40	$13.88	$0.00	$54.38
5	70	$33.50	$9.40	$15.67	$0.00	$58.57
6	75	$35.89	$9.40	$15.67	$0.00	$60.96
7	80	$38.28	$9.40	$17.46	$0.00	$65.14
8	85	$40.67	$9.40	$17.46	$0.00	$67.53

Notes: Steps are 750 hrs.
% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $32.36/ 3&4 $38.80/ 5&6 $58.01/ 7&8 $64.50

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.83	$12.50	$15.70	$0.00	$78.03
	12/01/2020	$50.98	$12.50	$15.70	$0.00	$79.18
	06/01/2021	$52.08	$12.50	$15.70	$0.00	$80.28
	12/01/2021	$53.23	$12.50	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$33.22	$12.50	$15.70	$0.00	$61.42
	12/01/2020	$34.00	$12.50	$15.70	$0.00	$62.20
	06/01/2021	$34.75	$12.50	$15.70	$0.00	$62.95
	12/01/2021	$35.54	$12.50	$15.70	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 35 (ZONE 2)*	01/01/2020	$40.46	$8.20	$22.10	$0.00	$70.76
	07/01/2020	$41.01	$8.25	$22.40	$0.00	$71.66
	01/01/2021	$41.56	$8.25	$21.75	$0.00	$71.56

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 35 Zone 2*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.23	$8.20	$0.00	$0.00	$28.43
2	55	$22.25	$8.20	$5.94	$0.00	$36.39
3	60	$24.28	$8.20	$6.48	$0.00	$38.96
4	65	$26.30	$8.20	$7.02	$0.00	$41.52
5	70	$28.32	$8.20	$18.86	$0.00	$55.38
6	75	$30.35	$8.20	$19.40	$0.00	$57.95
7	80	$32.37	$8.20	$19.94	$0.00	$60.51
8	90	$36.41	$8.20	$21.02	$0.00	$65.63

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.51	$8.25	$0.00	$0.00	$28.76
2	55	$22.56	$8.25	$6.05	$0.00	$36.86
3	60	$24.61	$8.25	$6.60	$0.00	$39.46
4	65	$26.66	$8.25	$7.15	$0.00	$42.06
5	70	$28.71	$8.25	$19.10	$0.00	$56.06
6	75	$30.76	$8.25	$19.65	$0.00	$58.66
7	80	$32.81	$8.25	$20.20	$0.00	$61.26
8	90	$36.91	$8.25	$21.30	$0.00	$66.46

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.83	$12.50	$15.70	$0.00	$78.03
	12/01/2020	$50.98	$12.50	$15.70	$0.00	$79.18
	06/01/2021	$52.08	$12.50	$15.70	$0.00	$80.28
	12/01/2021	$53.23	$12.50	$15.70	$0.00	$81.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$27.41	$12.50	$0.00	$0.00	$39.91
2	60	$29.90	$12.50	$15.70	$0.00	$58.10
3	65	$32.39	$12.50	$15.70	$0.00	$60.59
4	70	$34.88	$12.50	$15.70	$0.00	$63.08
5	75	$37.37	$12.50	$15.70	$0.00	$65.57
6	80	$39.86	$12.50	$15.70	$0.00	$68.06
7	85	$42.36	$12.50	$15.70	$0.00	$70.56
8	90	$44.85	$12.50	$15.70	$0.00	$73.05

Effective Date - 12/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$28.04	$12.50	$0.00	$0.00	$40.54
2	60	$30.59	$12.50	$15.70	$0.00	$58.79
3	65	$33.14	$12.50	$15.70	$0.00	$61.34
4	70	$35.69	$12.50	$15.70	$0.00	$63.89
5	75	$38.24	$12.50	$15.70	$0.00	$66.44
6	80	$40.78	$12.50	$15.70	$0.00	$68.98
7	85	$43.33	$12.50	$15.70	$0.00	$71.53
8	90	$45.88	$12.50	$15.70	$0.00	$74.08

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2020	$49.36	$13.35	$24.12	$2.61	$89.44
	08/01/2020	$50.96	$13.35	$24.12	$2.66	$91.09
	02/01/2021	$52.61	$13.35	$24.12	$2.71	$92.79
	08/01/2021	$54.36	$13.35	$24.12	$2.76	$94.59
	02/01/2022	$56.11	$13.35	$24.12	$2.81	$96.39
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 103*	03/01/2020	$53.50	$13.00	$19.20	$0.00	$85.70
	09/01/2020	$54.93	$13.00	$19.25	$0.00	$87.18
	03/01/2021	$56.13	$13.00	$19.28	$0.00	$88.41
	09/01/2021	$57.56	$13.00	$19.33	$0.00	$89.89
	03/01/2022	$58.76	$13.00	$19.36	$0.00	$91.12
	09/01/2022	$60.19	$13.00	$19.41	$0.00	$92.60
	03/01/2023	$61.39	$13.00	$19.44	$0.00	$93.83
For apprentice rates see "Apprentice- ELECTRICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2020	$49.36	$13.35	$24.12	$2.61	$89.44
	08/01/2020	$50.96	$13.35	$24.12	$2.66	$91.09
	02/01/2021	$52.61	$13.35	$24.12	$2.71	$92.79
	08/01/2021	$54.36	$13.35	$24.12	$2.76	$94.59
	02/01/2022	$56.11	$13.35	$24.12	$2.81	$96.39
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PIPEFITTERS LOCAL 537*	03/01/2020	$56.19	$10.95	$19.74	$0.00	$86.88
	09/01/2020	$57.69	$10.95	$19.74	$0.00	$88.38
	03/01/2021	$59.19	$10.95	$19.74	$0.00	$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PIPEFITTERS LOCAL 537*	03/01/2020	$56.19	$10.95	$19.74	$0.00	$86.88
	09/01/2020	$57.69	$10.95	$19.74	$0.00	$88.38
	03/01/2021	$59.19	$10.95	$19.74	$0.00	$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS *LABORERS - ZONE 1*	06/01/2020	$39.90	$8.60	$17.09	$0.00	$65.59
	12/01/2020	$40.88	$8.60	$17.09	$0.00	$66.57
	06/01/2021	$41.90	$8.60	$17.09	$0.00	$67.59
	12/01/2021	$42.91	$8.60	$17.09	$0.00	$68.60
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	09/01/2019	$48.44	$12.80	$16.40	$0.00	$77.64

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

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.22	$12.80	$11.90	$0.00	$48.92
2	60	$29.06	$12.80	$12.80	$0.00	$54.66
3	70	$33.91	$12.80	$13.70	$0.00	$60.41
4	80	$38.75	$12.80	$14.60	$0.00	$66.15

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 7 (BOSTON AREA)*	03/16/2019	$46.66	$8.00	$23.50	$0.00	$78.16

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 7 Boston*

Effective Date - 03/16/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$28.00	$8.00	$23.50	$0.00	$59.50
2	70	$32.66	$8.00	$23.50	$0.00	$64.16
3	75	$35.00	$8.00	$23.50	$0.00	$66.50
4	80	$37.33	$8.00	$23.50	$0.00	$68.83
5	85	$39.66	$8.00	$23.50	$0.00	$71.16
6	90	$41.99	$8.00	$23.50	$0.00	$73.49

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 1*	06/01/2020	$39.15	$8.60	$17.09	$0.00	$64.84
	12/01/2020	$40.13	$8.60	$17.09	$0.00	$65.82
	06/01/2021	$41.15	$8.60	$17.09	$0.00	$66.84
	12/01/2021	$42.16	$8.60	$17.09	$0.00	$67.85

Apprentice - *LABORER - Zone 1*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.49	$8.60	$17.09	$0.00	$49.18
2	70	$27.41	$8.60	$17.09	$0.00	$53.10
3	80	$31.32	$8.60	$17.09	$0.00	$57.01
4	90	$35.24	$8.60	$17.09	$0.00	$60.93

Effective Date - 12/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.08	$8.60	$17.09	$0.00	$49.77
2	70	$28.09	$8.60	$17.09	$0.00	$53.78
3	80	$32.10	$8.60	$17.09	$0.00	$57.79
4	90	$36.12	$8.60	$17.09	$0.00	$61.81

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER *LABORERS - ZONE 1*	06/01/2020	$39.15	$8.60	$17.09	$0.00	$64.84
	12/01/2020	$40.13	$8.60	$17.09	$0.00	$65.82
	06/01/2021	$41.15	$8.60	$17.09	$0.00	$66.84
	12/01/2021	$42.16	$8.60	$17.09	$0.00	$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 1*	06/01/2020	$39.15	$8.60	$17.09	$0.00	$64.84
	12/01/2020	$40.13	$8.60	$17.09	$0.00	$65.82
	06/01/2021	$41.15	$8.60	$17.09	$0.00	$66.84
	12/01/2021	$42.16	$8.60	$17.09	$0.00	$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 1*	06/01/2020	$39.30	$8.60	$17.09	$0.00	$64.99
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 1*	06/01/2020	$39.15	$8.60	$17.09	$0.00	$64.84
	12/01/2020	$40.13	$8.60	$17.09	$0.00	$65.82
	06/01/2021	$41.15	$8.60	$17.09	$0.00	$66.84
	12/01/2021	$42.16	$8.60	$17.09	$0.00	$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 1*	06/01/2020	$39.15	$8.60	$17.09	$0.00	$64.84
	12/01/2020	$40.13	$8.60	$17.09	$0.00	$65.82
	06/01/2021	$41.15	$8.60	$17.09	$0.00	$66.84
	12/01/2021	$42.16	$8.60	$17.09	$0.00	$67.85
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2020	$41.49	$10.75	$20.12	$0.00	$72.36
	08/01/2020	$42.57	$10.75	$20.27	$0.00	$73.59
	02/01/2021	$43.08	$10.75	$20.27	$0.00	$74.10
	08/01/2021	$44.20	$10.75	$20.43	$0.00	$75.38
	02/01/2022	$44.67	$10.75	$20.43	$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 - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.75	$10.75	$20.12	$0.00	$51.62
2	60	$24.89	$10.75	$20.12	$0.00	$55.76
3	70	$29.04	$10.75	$20.12	$0.00	$59.91
4	80	$33.19	$10.75	$20.12	$0.00	$64.06
5	90	$37.34	$10.75	$20.12	$0.00	$68.21

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.29	$10.75	$20.27	$0.00	$52.31
2	60	$25.54	$10.75	$20.27	$0.00	$56.56
3	70	$29.80	$10.75	$20.27	$0.00	$60.82
4	80	$34.06	$10.75	$20.27	$0.00	$65.08
5	90	$38.31	$10.75	$20.27	$0.00	$69.33

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2020	$54.42	$10.75	$21.93	$0.00	$87.10
	08/01/2020	$55.77	$10.75	$22.08	$0.00	$88.60
	02/01/2021	$56.41	$10.75	$22.08	$0.00	$89.24
	08/01/2021	$57.81	$10.75	$22.24	$0.00	$90.80
	02/01/2022	$58.38	$10.75	$22.24	$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 - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.21	$10.75	$21.93	$0.00	$59.89
2	60	$32.65	$10.75	$21.93	$0.00	$65.33
3	70	$38.09	$10.75	$21.93	$0.00	$70.77
4	80	$43.54	$10.75	$21.93	$0.00	$76.22
5	90	$48.98	$10.75	$21.93	$0.00	$81.66

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.89	$10.75	$22.08	$0.00	$60.72
2	60	$33.46	$10.75	$22.08	$0.00	$66.29
3	70	$39.04	$10.75	$22.08	$0.00	$71.87
4	80	$44.62	$10.75	$22.08	$0.00	$77.45
5	90	$50.19	$10.75	$22.08	$0.00	$83.02

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 1) *MILLWRIGHTS LOCAL 1121 - Zone 1*	04/01/2019	$42.22	$9.90	$18.50	$0.00	$70.62

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 1*

Effective Date - 04/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$23.22	$9.90	$5.31	$0.00	$38.43
2	65	$27.44	$9.90	$15.13	$0.00	$52.47
3	75	$31.67	$9.90	$16.10	$0.00	$57.67
4	85	$35.89	$9.90	$17.06	$0.00	$62.85

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$23.63	$12.50	$15.70	$0.00	$51.83
	12/01/2020	$24.20	$12.50	$15.70	$0.00	$52.40
	06/01/2021	$24.75	$12.50	$15.70	$0.00	$52.95
	12/01/2021	$25.33	$12.50	$15.70	$0.00	$53.53
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$28.29	$12.50	$15.70	$0.00	$56.49
	12/01/2020	$28.97	$12.50	$15.70	$0.00	$57.17
	06/01/2021	$29.61	$12.50	$15.70	$0.00	$57.81
	12/01/2021	$30.29	$12.50	$15.70	$0.00	$58.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2020	$50.96	$8.20	$22.10	$0.00	$81.26
	07/01/2020	$51.51	$8.25	$22.40	$0.00	$82.16
	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.48	$8.20	$0.00	$0.00	$33.68
2	55	$28.03	$8.20	$5.94	$0.00	$42.17
3	60	$30.58	$8.20	$6.48	$0.00	$45.26
4	65	$33.12	$8.20	$7.02	$0.00	$48.34
5	70	$35.67	$8.20	$18.86	$0.00	$62.73
6	75	$38.22	$8.20	$19.40	$0.00	$65.82
7	80	$40.77	$8.20	$19.94	$0.00	$68.91
8	90	$45.86	$8.20	$21.02	$0.00	$75.08

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.76	$8.25	$0.00	$0.00	$34.01
2	55	$28.33	$8.25	$6.05	$0.00	$42.63
3	60	$30.91	$8.25	$6.60	$0.00	$45.76
4	65	$33.48	$8.25	$7.15	$0.00	$48.88
5	70	$36.06	$8.25	$19.10	$0.00	$63.41
6	75	$38.63	$8.25	$19.65	$0.00	$66.53
7	80	$41.21	$8.25	$20.20	$0.00	$69.66
8	90	$46.36	$8.25	$21.30	$0.00	$75.91

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2020	$41.86	$8.20	$22.10	$0.00	$72.16
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	07/01/2020	$41.21	$8.25	$22.40	$0.00	$71.86
	01/01/2021	$42.96	$8.25	$22.75	$0.00	$73.96

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.93	$8.20	$0.00	$0.00	$29.13
2	55	$23.02	$8.20	$5.94	$0.00	$37.16
3	60	$25.12	$8.20	$6.48	$0.00	$39.80
4	65	$27.21	$8.20	$7.02	$0.00	$42.43
5	70	$29.30	$8.20	$18.86	$0.00	$56.36
6	75	$31.40	$8.20	$19.40	$0.00	$59.00
7	80	$33.49	$8.20	$19.94	$0.00	$61.63
8	90	$37.67	$8.20	$21.02	$0.00	$66.89

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.61	$8.25	$0.00	$0.00	$28.86
2	55	$22.67	$8.25	$6.05	$0.00	$36.97
3	60	$24.73	$8.25	$6.60	$0.00	$39.58
4	65	$26.79	$8.25	$7.15	$0.00	$42.19
5	70	$28.85	$8.25	$19.10	$0.00	$56.20
6	75	$30.91	$8.25	$19.65	$0.00	$58.81
7	80	$32.97	$8.25	$20.20	$0.00	$61.42
8	90	$37.09	$8.25	$21.30	$0.00	$66.64

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2020	$39.92	$8.20	$22.10	$0.00	$70.22
	07/01/2020	$40.47	$8.25	$22.40	$0.00	$71.12
	01/01/2021	$41.02	$8.25	$22.75	$0.00	$72.02

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.96	$8.20	$0.00	$0.00	$28.16
2	55	$21.96	$8.20	$5.94	$0.00	$36.10
3	60	$23.95	$8.20	$6.48	$0.00	$38.63
4	65	$25.95	$8.20	$7.02	$0.00	$41.17
5	70	$27.94	$8.20	$18.86	$0.00	$55.00
6	75	$29.94	$8.20	$19.40	$0.00	$57.54
7	80	$31.94	$8.20	$19.94	$0.00	$60.08
8	90	$35.93	$8.20	$21.02	$0.00	$65.15

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.24	$8.25	$0.00	$0.00	$28.49
2	55	$22.26	$8.25	$6.05	$0.00	$36.56
3	60	$24.28	$8.25	$6.60	$0.00	$39.13
4	65	$26.31	$8.25	$7.15	$0.00	$41.71
5	70	$28.33	$8.25	$19.10	$0.00	$55.68
6	75	$30.35	$8.25	$19.65	$0.00	$58.25
7	80	$32.38	$8.25	$20.20	$0.00	$60.83
8	90	$36.42	$8.25	$21.30	$0.00	$65.97

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS) *LABORERS - ZONE 1*	06/01/2020	$39.15	$8.60	$17.09	$0.00	$64.84
	12/01/2020	$40.13	$8.60	$17.09	$0.00	$65.82
	06/01/2021	$41.15	$8.60	$17.09	$0.00	$66.84
	12/01/2021	$42.16	$8.60	$17.09	$0.00	$67.85
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*	01/01/2020	$40.46	$8.20	$22.10	$0.00	$70.76
	07/01/2020	$41.01	$8.25	$22.40	$0.00	$71.66
	01/01/2021	$41.56	$8.25	$22.75	$0.00	$72.56

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.23	$8.20	$0.00	$0.00	$28.43
2	55	$22.25	$8.20	$5.94	$0.00	$36.39
3	60	$24.28	$8.20	$6.48	$0.00	$38.96
4	65	$26.30	$8.20	$7.02	$0.00	$41.52
5	70	$28.32	$8.20	$18.86	$0.00	$55.38
6	75	$30.35	$8.20	$19.40	$0.00	$57.95
7	80	$32.37	$8.20	$19.94	$0.00	$60.51
8	90	$36.41	$8.20	$21.02	$0.00	$65.63

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.51	$8.25	$0.00	$0.00	$28.76
2	55	$22.56	$8.25	$6.05	$0.00	$36.86
3	60	$24.61	$8.25	$6.60	$0.00	$39.46
4	65	$26.66	$8.25	$7.15	$0.00	$42.06
5	70	$28.71	$8.25	$19.10	$0.00	$56.06
6	75	$30.76	$8.25	$19.65	$0.00	$58.66
7	80	$32.81	$8.25	$20.20	$0.00	$61.26
8	90	$36.91	$8.25	$21.30	$0.00	$66.46

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2020	$38.52	$8.20	$22.10	$0.00	$68.82
	07/01/2020	$39.07	$8.25	$22.40	$0.00	$69.72
	01/01/2021	$39.62	$8.25	$22.75	$0.00	$70.62

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.26	$8.20	$0.00	$0.00	$27.46
2	55	$21.19	$8.20	$5.94	$0.00	$35.33
3	60	$23.11	$8.20	$6.48	$0.00	$37.79
4	65	$25.04	$8.20	$7.02	$0.00	$40.26
5	70	$26.96	$8.20	$18.86	$0.00	$54.02
6	75	$28.89	$8.20	$19.40	$0.00	$56.49
7	80	$30.82	$8.20	$19.94	$0.00	$58.96
8	90	$34.67	$8.20	$21.02	$0.00	$63.89

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.54	$8.25	$0.00	$0.00	$27.79
2	55	$21.49	$8.25	$6.05	$0.00	$35.79
3	60	$23.44	$8.25	$6.60	$0.00	$38.29
4	65	$25.40	$8.25	$7.15	$0.00	$40.80
5	70	$27.35	$8.25	$19.10	$0.00	$54.70
6	75	$29.30	$8.25	$19.65	$0.00	$57.20
7	80	$31.26	$8.25	$20.20	$0.00	$59.71
8	90	$35.16	$8.25	$21.30	$0.00	$64.71

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	06/01/2020	$36.08	$12.41	$13.72	$0.00	$62.21
	08/01/2020	$36.08	$12.91	$13.72	$0.00	$62.71
	12/01/2020	$36.08	$12.91	$14.82	$0.00	$63.81
	06/01/2021	$36.88	$12.91	$14.82	$0.00	$64.61
	08/01/2021	$36.88	$13.41	$14.82	$0.00	$65.11
	12/01/2021	$36.88	$13.41	$16.01	$0.00	$66.30
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	$48.94	$9.90	$21.15	$0.00	$79.99
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2019	$48.94	$9.90	$21.15	$0.00	$79.99

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 1*

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.47	$9.90	$21.15	$0.00	$55.52
2	60	$29.36	$9.90	$21.15	$0.00	$60.41
3	70	$34.26	$9.90	$21.15	$0.00	$65.31
4	75	$36.71	$9.90	$21.15	$0.00	$67.76
5	80	$39.15	$9.90	$21.15	$0.00	$70.20
6	80	$39.15	$9.90	$21.15	$0.00	$70.20
7	90	$44.05	$9.90	$21.15	$0.00	$75.10
8	90	$44.05	$9.90	$21.15	$0.00	$75.10

Notes:

Apprentice to Journeyworker Ratio:1:5

PIPEFITTER & STEAMFITTER *PIPEFITTERS LOCAL 537*	03/01/2020	$56.19	$10.95	$19.74	$0.00	$86.88
	09/01/2020	$57.69	$10.95	$19.74	$0.00	$88.38
	03/01/2021	$59.19	$10.95	$19.74	$0.00	$89.88

Apprentice - *PIPEFITTER - Local 537*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$22.48	$10.95	$8.00	$0.00	$41.43
2	45	$25.29	$10.95	$19.74	$0.00	$55.98
3	60	$33.71	$10.95	$19.74	$0.00	$64.40
4	70	$39.33	$10.95	$19.74	$0.00	$70.02
5	80	$44.95	$10.95	$19.74	$0.00	$75.64

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$23.08	$10.95	$8.00	$0.00	$42.03
2	45	$25.96	$10.95	$19.74	$0.00	$56.65
3	60	$34.61	$10.95	$19.74	$0.00	$65.30
4	70	$40.38	$10.95	$19.74	$0.00	$71.07
5	80	$46.15	$10.95	$19.74	$0.00	$76.84

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:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
PLUMBERS & GASFITTERS *PLUMBERS & GASFITTERS LOCAL 12*	03/01/2020	$58.69	$12.07	$17.26	$0.00	$88.02
	09/01/2020	$60.19	$12.07	$17.26	$0.00	$89.52
	03/01/2021	$61.69	$12.07	$17.26	$0.00	$91.02

Apprentice - *PLUMBER/GASFITTER - Local 12*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$20.54	$12.07	$6.24	$0.00	$38.85
2	40	$23.48	$12.07	$7.08	$0.00	$42.63
3	55	$32.28	$12.07	$9.63	$0.00	$53.98
4	65	$38.15	$12.07	$11.33	$0.00	$61.55
5	75	$44.02	$12.07	$13.03	$0.00	$69.12

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.07	$12.07	$6.24	$0.00	$39.38
2	40	$24.08	$12.07	$7.08	$0.00	$43.23
3	55	$33.10	$12.07	$9.63	$0.00	$54.80
4	65	$39.12	$12.07	$11.33	$0.00	$62.52
5	75	$45.14	$12.07	$13.03	$0.00	$70.24

Notes:

** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic$65.32, Step5 with lic$72.89

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) *PIPEFITTERS LOCAL 537*	03/01/2020	$56.19	$10.95	$19.74	$0.00	$86.88
	09/01/2020	$57.69	$10.95	$19.74	$0.00	$88.38
	03/01/2021	$59.17	$10.95	$19.74	$0.00	$89.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER *LABORERS - ZONE 1*	06/01/2020	$40.15	$8.60	$17.09	$0.00	$65.84
	12/01/2020	$41.13	$8.60	$17.09	$0.00	$66.82
	06/01/2021	$42.15	$8.60	$17.09	$0.00	$67.84
	12/01/2021	$43.16	$8.60	$17.09	$0.00	$68.85
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.83	$12.50	$15.70	$0.00	$78.03
	12/01/2020	$50.98	$12.50	$15.70	$0.00	$79.18
	06/01/2021	$52.08	$12.50	$15.70	$0.00	$80.28
	12/01/2021	$53.23	$12.50	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.83	$12.50	$15.70	$0.00	$78.03
	12/01/2020	$50.98	$12.50	$15.70	$0.00	$79.18
	06/01/2021	$52.08	$12.50	$15.70	$0.00	$80.28
	12/01/2021	$53.23	$12.50	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$33.22	$12.50	$15.70	$0.00	$61.42
	12/01/2020	$34.00	$12.50	$15.70	$0.00	$62.20
	06/01/2021	$34.75	$12.50	$15.70	$0.00	$62.95
	12/01/2021	$35.54	$12.50	$15.70	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 42 - J.G. MacLeallan (Wakefield)*	05/01/2020	$26.65	$7.99	$7.00	$0.00	$41.64
	05/01/2021	$27.00	$7.99	$7.00	$0.00	$41.99
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	03/01/2020	$45.67	$11.50	$15.90	$0.00	$73.07
	08/01/2020	$47.10	$11.50	$15.90	$0.00	$74.50
	02/01/2021	$48.53	$11.50	$15.90	$0.00	$75.93
	08/01/2021	$49.96	$11.50	$15.90	$0.00	$77.36
	02/01/2022	$51.39	$11.50	$15.90	$0.00	$78.79

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ROOFER - Local 33*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.84	$11.50	$3.69	$0.00	$38.03
2	60	$27.40	$11.50	$15.90	$0.00	$54.80
3	65	$29.69	$11.50	$15.90	$0.00	$57.09
4	75	$34.25	$11.50	$15.90	$0.00	$61.65
5	85	$38.82	$11.50	$15.90	$0.00	$66.22

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.55	$11.50	$3.69	$0.00	$38.74
2	60	$28.26	$11.50	$15.90	$0.00	$55.66
3	65	$30.62	$11.50	$15.90	$0.00	$58.02
4	75	$35.33	$11.50	$15.90	$0.00	$62.73
5	85	$40.04	$11.50	$15.90	$0.00	$67.44

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:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	03/01/2020	$45.92	$11.50	$15.90	$0.00	$73.32
	08/01/2020	$47.35	$11.50	$15.90	$0.00	$74.75
	02/01/2021	$48.78	$11.50	$15.90	$0.00	$76.18
	08/01/2021	$50.21	$11.50	$15.90	$0.00	$77.61
	02/01/2022	$51.64	$11.50	$15.90	$0.00	$79.04
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2020	$49.36	$13.35	$24.12	$2.61	$89.44
	08/01/2020	$50.96	$13.35	$24.12	$2.66	$91.09
	02/01/2021	$52.61	$13.35	$24.12	$2.71	$92.79
	08/01/2021	$54.36	$13.35	$24.12	$2.76	$94.59
	02/01/2022	$56.11	$13.35	$24.12	$2.81	$96.39

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$20.73	$13.35	$5.89	$0.00	$39.97
2	42	$20.73	$13.35	$5.89	$0.00	$39.97
3	47	$23.20	$13.35	$11.13	$1.43	$49.11
4	47	$23.20	$13.35	$11.13	$1.43	$49.11
5	52	$25.67	$13.35	$12.08	$1.53	$52.63
6	52	$25.67	$13.35	$12.33	$1.54	$52.89
7	60	$29.62	$13.35	$13.70	$1.70	$58.37
8	65	$32.08	$13.35	$15.15	$1.80	$62.38
9	75	$37.02	$13.35	$16.56	$2.01	$68.94
10	85	$41.96	$13.35	$17.96	$2.20	$75.47

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$21.40	$13.35	$5.89	$0.00	$40.64
2	42	$21.40	$13.35	$5.89	$0.00	$40.64
3	47	$23.95	$13.35	$11.13	$1.45	$49.88
4	47	$23.95	$13.35	$11.13	$1.45	$49.88
5	52	$26.50	$13.35	$12.08	$1.56	$53.49
6	52	$26.50	$13.35	$12.33	$1.57	$53.75
7	60	$30.58	$13.35	$13.70	$1.73	$59.36
8	65	$33.12	$13.35	$15.15	$1.85	$63.47
9	75	$38.22	$13.35	$16.56	$2.04	$70.17
10	85	$43.32	$13.35	$17.96	$2.24	$76.87

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	06/01/2020	$36.54	$12.41	$13.72	$0.00	$62.67
	08/01/2020	$36.54	$12.91	$13.72	$0.00	$63.17
	12/01/2020	$36.54	$12.91	$14.82	$0.00	$64.27
	06/01/2021	$37.34	$12.91	$14.82	$0.00	$65.07
	08/01/2021	$37.34	$13.41	$14.82	$0.00	$65.57
	12/01/2021	$37.34	$13.41	$16.01	$0.00	$66.76
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	06/01/2020	$36.83	$12.41	$13.72	$0.00	$62.96
	08/01/2020	$36.83	$12.91	$13.72	$0.00	$63.46
	12/01/2020	$36.83	$12.91	$14.82	$0.00	$64.56
	06/01/2021	$37.63	$12.91	$14.82	$0.00	$65.36
	08/01/2021	$37.63	$13.41	$14.82	$0.00	$65.86
	12/01/2021	$37.63	$13.41	$16.01	$0.00	$67.05

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPRINKLER FITTER	03/01/2020	$60.82	$9.68	$20.55	$0.00	$91.05
SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1	10/01/2020	$62.32	$9.68	$20.55	$0.00	$92.55
	03/01/2021	$63.82	$9.68	$20.55	$0.00	$94.05

Apprentice - *SPRINKLER FITTER - Local 550 (Section A) Zone 1*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.29	$9.68	$11.61	$0.00	$42.58
2	40	$24.33	$9.68	$12.30	$0.00	$46.31
3	45	$27.37	$9.68	$12.99	$0.00	$50.04
4	50	$30.41	$9.68	$13.73	$0.00	$53.82
5	55	$33.45	$9.68	$14.36	$0.00	$57.49
6	60	$36.49	$9.68	$15.05	$0.00	$61.22
7	65	$39.53	$9.68	$15.74	$0.00	$64.95
8	70	$42.57	$9.68	$16.43	$0.00	$68.68
9	75	$45.62	$9.68	$17.11	$0.00	$72.41
10	80	$48.66	$9.68	$17.80	$0.00	$76.14

Effective Date - 10/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.81	$9.68	$11.61	$0.00	$43.10
2	40	$24.93	$9.68	$12.30	$0.00	$46.91
3	45	$28.04	$9.68	$12.99	$0.00	$50.71
4	50	$31.16	$9.68	$13.73	$0.00	$54.57
5	55	$34.28	$9.68	$14.36	$0.00	$58.32
6	60	$37.39	$9.68	$15.05	$0.00	$62.12
7	65	$40.51	$9.68	$15.74	$0.00	$65.93
8	70	$43.62	$9.68	$16.43	$0.00	$69.73
9	75	$46.74	$9.68	$17.11	$0.00	$73.53
10	80	$49.86	$9.68	$17.80	$0.00	$77.34

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	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
OPERATING ENGINEERS LOCAL 4	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
OPERATING ENGINEERS LOCAL 4	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 103*	03/01/2020	$40.13	$13.00	$17.12	$0.00	$70.25
	09/01/2020	$41.20	$13.00	$17.16	$0.00	$71.36
	03/01/2021	$42.66	$13.00	$17.27	$0.00	$72.93
	09/01/2021	$44.32	$13.00	$17.38	$0.00	$74.70
	03/01/2022	$45.83	$13.00	$17.49	$0.00	$76.32
	09/01/2022	$47.55	$13.00	$17.62	$0.00	$78.17
	03/01/2023	$49.11	$13.00	$17.73	$0.00	$79.84

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 103*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$18.06	$13.00	$0.54	$0.00	$31.60
2	45	$18.06	$13.00	$0.54	$0.00	$31.60
3	50	$20.07	$13.00	$14.00	$0.00	$47.07
4	50	$20.07	$13.00	$14.00	$0.00	$47.07
5	55	$22.07	$13.00	$14.31	$0.00	$49.38
6	60	$24.08	$13.00	$14.62	$0.00	$51.70
7	65	$26.08	$13.00	$14.94	$0.00	$54.02
8	70	$28.09	$13.00	$15.25	$0.00	$56.34
9	75	$30.10	$13.00	$15.56	$0.00	$58.66
10	80	$32.10	$13.00	$15.87	$0.00	$60.97

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$18.54	$13.00	$0.57	$0.00	$32.11
2	45	$18.54	$13.00	$0.57	$0.00	$32.11
3	50	$20.60	$13.00	$14.02	$0.00	$47.62
4	50	$20.60	$13.00	$14.02	$0.00	$47.62
5	55	$22.66	$13.00	$14.33	$0.00	$49.99
6	60	$24.72	$13.00	$14.64	$0.00	$52.36
7	65	$26.78	$13.00	$14.96	$0.00	$54.74
8	70	$28.84	$13.00	$15.28	$0.00	$57.12
9	75	$30.90	$13.00	$15.59	$0.00	$59.49
10	80	$32.96	$13.00	$15.90	$0.00	$61.86

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2020	$53.34	$10.75	$21.94	$0.00	$86.03
	08/01/2020	$54.69	$10.75	$22.09	$0.00	$87.53
	02/01/2021	$55.33	$10.75	$22.09	$0.00	$88.17
	08/01/2021	$56.73	$10.75	$22.25	$0.00	$89.73
	02/01/2022	$57.32	$10.75	$22.25	$0.00	$90.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.67	$10.75	$21.94	$0.00	$59.36
2	60	$32.00	$10.75	$21.94	$0.00	$64.69
3	70	$37.34	$10.75	$21.94	$0.00	$70.03
4	80	$42.67	$10.75	$21.94	$0.00	$75.36
5	90	$48.01	$10.75	$21.94	$0.00	$80.70

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.35	$10.75	$22.09	$0.00	$60.19
2	60	$32.81	$10.75	$22.09	$0.00	$65.65
3	70	$38.28	$10.75	$22.09	$0.00	$71.12
4	80	$43.75	$10.75	$22.09	$0.00	$76.59
5	90	$49.22	$10.75	$22.09	$0.00	$82.06

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$40.55	$8.60	$17.24	$0.00	$66.39
	12/01/2020	$41.53	$8.60	$17.24	$0.00	$67.37
	06/01/2021	$42.55	$8.60	$17.24	$0.00	$68.39
	12/01/2021	$43.56	$8.60	$17.24	$0.00	$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.27	$8.60	$17.24	$0.00	$65.11
	12/01/2020	$40.25	$8.60	$17.24	$0.00	$66.09
	06/01/2021	$41.27	$8.60	$17.24	$0.00	$67.11
	12/01/2021	$42.28	$8.60	$17.24	$0.00	$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.31	$12.50	$15.70	$0.00	$77.51
	12/01/2020	$50.45	$12.50	$15.70	$0.00	$78.65
	06/01/2021	$51.54	$12.50	$15.70	$0.00	$79.74
	12/01/2021	$52.68	$12.50	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	06/01/2020	$37.12	$12.41	$13.72	$0.00	$63.25
	08/01/2020	$37.12	$12.91	$13.72	$0.00	$63.75
	12/01/2020	$37.12	$12.91	$14.82	$0.00	$64.85
	06/01/2021	$37.92	$12.91	$14.82	$0.00	$65.65
	08/01/2021	$37.92	$13.41	$14.82	$0.00	$66.15
	12/01/2021	$37.92	$13.41	$16.01	$0.00	$67.34
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	06/01/2020	$51.38	$8.60	$17.69	$0.00	$77.67
	12/01/2020	$52.36	$8.60	$17.69	$0.00	$78.65
	06/01/2021	$53.38	$8.60	$17.69	$0.00	$79.67
	12/01/2021	$54.39	$8.60	$17.69	$0.00	$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	06/01/2020	$53.38	$8.60	$17.69	$0.00	$79.67
	12/01/2020	$54.36	$8.60	$17.69	$0.00	$80.65
	06/01/2021	$55.38	$8.60	$17.69	$0.00	$81.67
	12/01/2021	$56.39	$8.60	$17.69	$0.00	$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	06/01/2020	$43.45	$8.60	$17.69	$0.00	$69.74
	12/01/2020	$44.43	$8.60	$17.69	$0.00	$70.72
	06/01/2021	$45.45	$8.60	$17.69	$0.00	$71.74
	12/01/2021	$46.46	$8.60	$17.69	$0.00	$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	06/01/2020	$45.45	$8.60	$17.69	$0.00	$71.74
	12/01/2020	$46.43	$8.60	$17.69	$0.00	$72.72
	06/01/2021	$47.45	$8.60	$17.69	$0.00	$73.74
	12/01/2021	$48.46	$8.60	$17.69	$0.00	$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE A*	06/01/2020	$36.54	$12.41	$13.72	$0.00	$62.67
	08/01/2020	$36.54	$12.91	$13.72	$0.00	$63.17
	12/01/2020	$36.54	$12.91	$14.82	$0.00	$64.27
	06/01/2021	$37.34	$12.91	$14.82	$0.00	$65.07
	08/01/2021	$37.34	$13.41	$14.82	$0.00	$65.57
	12/01/2021	$37.34	$13.41	$16.01	$0.00	$66.76
WAGON DRILL OPERATOR *LABORERS - ZONE 1*	06/01/2020	$39.40	$8.60	$17.09	$0.00	$65.09
	12/01/2020	$40.38	$8.60	$17.09	$0.00	$66.07
	06/01/2021	$41.40	$8.60	$17.09	$0.00	$67.09
	12/01/2021	$42.41	$8.60	$17.09	$0.00	$68.10
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.83	$12.50	$15.70	$0.00	$78.03
	12/01/2020	$50.98	$12.50	$15.70	$0.00	$79.18
	06/01/2021	$52.08	$12.50	$15.70	$0.00	$80.28
	12/01/2021	$53.23	$12.50	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & GASFITTERS LOCAL 12*	03/01/2020	$58.69	$12.07	$17.26	$0.00	$88.02
	09/01/2020	$60.19	$12.07	$17.26	$0.00	$89.52
	03/01/2021	$61.69	$12.07	$17.26	$0.00	$91.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Outside Electrical - East

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CABLE TECHNICIAN (Power Zone) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$28.83	$8.75	$1.86	$0.00	$39.44
	08/30/2020	$29.67	$9.25	$1.89	$0.00	$40.81
CABLEMAN (Underground Ducts & Cables) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$40.84	$8.75	$10.02	$0.00	$59.61
	08/30/2020	$42.03	$9.25	$10.27	$0.00	$61.55
DRIVER / GROUNDMAN CDL *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$33.64	$8.75	$9.86	$0.00	$52.25
	08/30/2020	$34.62	$9.25	$10.07	$0.00	$53.94
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$26.43	$8.75	$1.79	$0.00	$36.97
	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
EQUIPMENT OPERATOR (Class A CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$40.84	$8.75	$14.10	$0.00	$63.69
	08/30/2020	$42.03	$9.25	$14.35	$0.00	$65.63
EQUIPMENT OPERATOR (Class B CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$36.04	$8.75	$10.65	$0.00	$55.44
	08/30/2020	$37.09	$9.25	$10.87	$0.00	$57.21
GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$21.62	$8.75	$1.65	$0.00	$32.02
	08/30/2020	$22.25	$9.25	$1.67	$0.00	$33.17
GROUNDMAN -Inexperienced (<2000 Hrs.) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$26.43	$8.75	$1.79	$0.00	$36.97
	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
JOURNEYMAN LINEMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	09/01/2019	$48.05	$8.75	$17.19	$0.00	$73.99
	08/30/2020	$49.45	$9.25	$17.48	$0.00	$76.18

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$28.83	$8.75	$3.36	$0.00	$40.94
2	65	$31.23	$8.75	$3.44	$0.00	$43.42
3	70	$33.64	$8.75	$3.51	$0.00	$45.90
4	75	$36.04	$8.75	$5.08	$0.00	$49.87
5	80	$38.44	$8.75	$5.15	$0.00	$52.34
6	85	$40.84	$8.75	$5.23	$0.00	$54.82
7	90	$43.25	$8.75	$7.30	$0.00	$59.30

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$29.67	$9.25	$3.39	$0.00	$42.31
2	65	$32.14	$9.25	$3.46	$0.00	$44.85
3	70	$34.62	$9.25	$3.54	$0.00	$47.41
4	75	$37.09	$9.25	$5.11	$0.00	$51.45
5	80	$39.56	$9.25	$5.19	$0.00	$54.00
6	85	$42.03	$9.25	$5.26	$0.00	$56.54
7	90	$44.51	$9.25	$7.34	$0.00	$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$30.73	$4.70	$3.17	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77

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.

Division 2
Existing Conditions

SECTION 023000

SUBSURFACE EXPLORATION DATA

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 SUBSURFACE DATA

A. Subsurface soil investigations have been made and the results are attached to this Section. Refer to the Drawings for additional information.

Attachment A – GZA Geotechnical Engineering Report
Attachment B – Loam / Topsoil Sampling Report (to be issued by Addendum)

B. The subsurface data are provided for the information of the Bidders. Bidders shall interpret these subsurface data according to their own judgment and shall understand that the subsurface conditions may vary from those recorded herein. Neither the Owner, nor the Architect shall be liable for any error or discrepancy in the information given. Bidders shall make such investigations on the site as necessary to verify conditions, and shall assume for themselves the character of materials to be encountered.

END OF SECTION

ATTACHMENT A

GZA Geotechnical Engineering Report

EARLY SITE PREPARATION
WOBURN FIRE HEADQUARTERS
SUBSURFACE EXPLORATION DATA
023000

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31 State Street
8th Floor
Boston, MA 02109
T: 617.963.1000
www.gza.com

May 4, 2020
Revised June 29, 2020
File No. 01.0174360.20

DiNisco Design Partnership
99 Chauncy Street, Suite 901
Boston, MA 02111

Attention: Mr. Rick Rice

RE: Revised Geotechnical Engineering Report
Proposed Woburn Fire Department Headquarters
729-749 Main Street
Woburn, Massachusetts 02421

Dear Mr. Rice:

In accordance with our addendum dated March 26, 2020 to our existing agreement executed on August 30, 2019, GZA GeoEnvironmental, Inc. (GZA) is pleased to submit this revised geotechnical report to DiNisco Design Partnership (Client) for the proposed Woburn Fire Department Headquarters. This report incorporates the results of our recent subsurface exploration program and provides geotechnical recommendations for design and construction of the proposed Fire Department Headquarters building and associated Maintenance building, in Woburn, Massachusetts. This report is subject to the Limitations in **Appendix A**.

Elevations (El.) in this report are in feet and reference the National American Vertical Datum of 1988 (NAVD88).

BACKGROUND

Our understanding of the project is based on our email and telephone correspondence with you, and the following:

- "Existing Conditions Plan of Land in Woburn, MA" by Hancock Associates, dated July 12, 2019;
- "Proposed Site Plan" by DiNisco Design, dated August 6, 2019;
- "North Entry Site Plan Study" by Hancock Associates, with a revision date of July 1, 2019;
- A set of architectural plans by DiNisco Design, dated August 16, 2019; and
- Readily available on-line aerial photographs and geologic information.

Existing Conditions

The Site is a moderately wooded parcel bounded by Main Street to the west, residential abutters to the north and south, and tree cover to the east. Existing site grades in the area of the proposed site development range from approximately El. 109 feet in the west to 135 feet in the east (NAVD88) based on the Existing Conditions Plan of Land. An Exploration Location Plan is attached as **Figure 1**.

Proposed Development

The proposed development includes two buildings, parking areas, stormwater management areas, and site utilities. The proposed buildings include two one- to two-story buildings. The Maintenance building will have a footprint of about 8,500 square feet (SF) and the Headquarters building will have a footprint of about 20,000 SF. Both buildings have a proposed first floor elevation of about 116.5; no basements are planned. A parking lot area is proposed to the north and a driveway is proposed to the south. Stormwater management areas are planned for the western portion of the north parking lot: we understand that the site-civil engineer reviewed the test pit data to design the areas to avoid bedrock removal. Landscaped areas are proposed surrounding the buildings with a site retaining wall to the north. Site grades will vary from about El. 115 to 120, except along the southern and northern perimeters of the site where grades are as high as El. 130. The proposed grading requires fills of up to about 7 feet and cuts of up to about 15 feet, exclusive of cuts for footings and utilities.

SUBSURFACE EXPLORATIONS

GZA Test Pits

GZA retained Cryan Landscaping Contractors, Inc. of Attleboro, Massachusetts to excavate 31 test pits with a tracked excavator between September 19 and 23, 2019, and 11 additional test pits with a tracked excavator between April 16 and 17, 2020. Twenty-five of the test pits extended to refusal at depths ranging between approximately 3 and 12 feet below ground surface (bgs). The remaining seventeen test pits did not encounter refusal and were terminated in the glacial till, sand, or sand and gravel at depths between 4 and 14 feet bgs. Eighteen of the test pits were performed within (or close to) the proposed building footprints (TP-1 through TP-8, TP-23 through TP-31, and TP-105), with the remainder of the test pits performed within proposed parking lot/driveway, stormwater management or retaining wall areas.

GZA representatives observed the test pits, obtained samples for laboratory testing, classified the soil encountered using the Modified Burmister Soil Classification System and prepared test pit logs. Test pit logs are attached as **Appendix B**.

LABORATORY ANALYSES

Laboratory grain size analyses were performed on thirteen soil samples obtained from the test pits to confirm field classifications, and to help evaluate potential re-use as backfill on-site. Laboratory results are included in **Appendix C**.

SUBSURFACE CONDITIONS

Subsurface Profile

Subsurface conditions encountered in the test pits generally consisted of Topsoil and Subsoil overlying Sand/Sand and Gravel, Glacial Till, and Bedrock. Weathered Bedrock was observed in two test pits below the Glacial Till or Sand/Sand and Gravel. The test pits were terminated in the Glacial Till, Sand, or Sand and Gravel between 3.1 and 14 feet bgs or at refusal on Bedrock or large boulders. Exposed rock (either large boulders or Bedrock) was observed at the ground surface on-site, typically near higher elevations of the site.

The soil strata encountered in the test pits 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 test pit logs in **Appendix B**, for detailed information, and **Table 1** for a summary of subsurface conditions.

Topsoil: Topsoil was encountered from the ground surface up to a depth of up to about 1.5 feet bgs in the 42 test pits. The Topsoil generally varied from dark brown Silt with of up to 50 percent Sand, up to 20 percent Gravel, and Cobbles, and less than 10 percent Roots, Leaves, and Wood to dark brown, fine Sand, with up to 35 percent Silt and up to 20 percent Organics[1]. The Topsoil appeared to be a mix of Topsoil and Forest Mat material. Boulders ranging in size from approximately 6 to greater than 36 inches in diameter were encountered in 8 test pits (TP-2, TP-4, TP-5, TP-7, TP-13, TP-21, TP-22, and TP-30).

Subsoil: Subsoil was encountered below the Topsoil in 39 of the 42 test pits. The Subsoil was approximately 0.9 to 4.5 feet in thickness, but typically was less than 2.5 feet thick. This stratum generally consisted of brown to gray, Silt to Clayey Silt, with up to 35 percent fine to coarse Sand, up to 20 percent Gravel, and less than 10 percent Roots and light brown, fine to fine to medium Sand, with up to 35 percent Silt, up to 20 percent gravel, and cobbles, and less than 10 percent Root or Organics. Boulders ranging in size from approximately 6 to greater than 36 inches in diameter were encountered in 28 test pits (TP-3 through TP-5, TP-10 through TP-13, TP-15, TP-17, TP-20 through TP-31, TP-101, TP-103, TP-105 through TP-107 and TP-109). The combined thickness of the Topsoil and Subsoil layers ranged between approximately 1 and 6 feet, but was typically less than 3.5 feet.

Sand/Sand and Gravel: Natural Sand/Sand and Gravel was encountered below the Topsoil/Subsoil in 16 of the test pits (TP-1, TP-2, TP-4, TP-8, TP-9, TP-10, TP-14, TP-18, TP-19, TP-23, TP-24, TP-26, TP-31, TP-104, TP-108 and TP-111). The Sand/Sand and Gravel ranged from about 1 to greater than 11 feet in thickness and extended to the refusal depth of about 9 and 8.4 feet bgs in test pits TP-4 and TP-8, corresponding to approximately El. 101 and 113 feet, respectively. Four test pits (TP-1, TP-2, TP-9 and TP-111) were terminated in this stratum at depths ranging between about 10.4 and 12.3 feet bgs. This stratum generally consisted of light brown to brown to grey, fine to coarse Sand, with a up to 50 percent Gravel, up to 35 percent Silt, up to 20 percent Cobbles, and less than 10 percent Roots. In some areas, the stratum consisted of fine to coarse Gravel with up to 50 percent Sand. Boulders ranging in size from approximately 6 to greater than 36 inches in diameter were encountered in 14 test pits (TP-1 through TP-4, TP-8, TP-10, TP-14, TP-19, TP-23, TP-24, TP-26, TP-31, TP-108 and TP-111).

Glacial Till: Glacial Till was encountered in 35 test pits (TP-3, TP-5 through TP-7, TP-10 through TP-17, TP-19 through TP-31, TP-101 through TP-110) below the Subsoil and/or Sand/Sand and Gravel. The Glacial Till ranged from about 0.5 feet to greater than 12 feet in thickness. Twenty-one test pits (TP-3, TP-5, TP-6, TP-7, TP-10, TP-11, TP-14, TP-15, TP-17, TP-20, TP-21, TP-22, TP-25,TP-26, TP-101 through TP-104, TP-106, and TP-108 through TP-109) were terminated due to excavator refusal in, or at the bottom of, this stratum at depths ranging from approximately 3 to 12 feet bgs, corresponding to approximately El. 107 to 125 feet. Seven test pits (TP-23, TP-24, and TP-27 through TP-31) located within proposed building areas were terminated approximately 2 feet into the Glacial Till at depths of between approximately 4 and 6.4 feet bgs, corresponding to about El. 109 to 108.6 feet; these test pits were terminated without encountering refusal to limit disturbance of the foundation bearing stratum. Three test pits (TP-105, TP-107 and TP-110) were terminated due to sidewalls collapsing and/or encountering groundwater.

The glacial till generally consisted of light brown to brown to gray, fine to coarse Sand with up to 50 percent Gravel, up to 35 percent Silt, and up to 20 percent Cobbles. Boulders ranging in size from approximately 6 to greater than 36

[1] Classifications are based on visual estimates (by weight).

inches in diameter were encountered in 35 test pits (TP-3, TP-5 through TP-7, TP-10 through TP-17, TP-19 through TP-31, and TP-101 through TP-110).

Weathered Bedrock: Weathered Bedrock was observed in two test pits (TP-18 and TP-19), below the Sand/Sand and Gravel or Glacial Till. Weathered Bedrock was defined by the presence of large cobble- to boulder-sized (between 3 and greater than 36 inches in diameter), angular rock fragments. The Weathered Bedrock was approximately 3 and 1.6 feet in thickness in test pits TP-18 and TP-19, respectively. Excavator refusal was encountered on apparent sound bedrock at approximately 7.2 and 7.1 feet bgs in test pits TP-18 and TP-19, respectively, corresponding to about El. 108 and 111.

Bedrock: Excavator refusal due to apparent sound Bedrock was encountered in 21 test pits (TP-3 through TP-8, TP-10, TP-14, TP-15, TP-18, TP-19, TP-22, TP-25, TP-26, TP-101 through TP-104, TP-106, TP-108, and TP-109) at depths of approximately 3 to 12 feet bgs, corresponding to approximately El. 98.5 to 128.5 feet.

Groundwater

Groundwater was encountered in five of the test pits (TP-4, TP-7,TP-16, TP-107 and TP-110) at the time of our explorations between 8.5 and 14 feet bgs, corresponding to elevations between approximately 98 and 111 feet. In addition, soil mottling was noted within test pits TP-1, TP-2, TP-4, TP-7, TP-10, TP-106, TP-107, and TP-110, at depths of between 3.2 and 12 feet bgs (El. 104 to 120) indicating possible seasonal high groundwater levels. Note that seasonal fluctuations in the observed groundwater levels will occur due to variations in precipitation, temperature, storm events and other factors different from those existing at the time the measurements were made. We would anticipate that groundwater levels would be higher at certain times of the year and following precipitation events.

GEOTECHNICAL IMPLICATIONS OF SUBSURFACE CONDITIONS

The primary geotechnical issues impacting design and construction of the proposed buildings include shallow bedrock along the east and southeast of the proposed buildings and the potential reuse of excavated materials at the site. Based on the proposed site grading, cuts on the order of 5 to 7 feet and fills on the order of 7 to 9 feet are anticipated in the building areas to reach the proposed first floor elevation. Additionally, cuts on the order of 5 to 6 feet and fills on the order of 6 to 8 feet are anticipated in paved areas outside of the building footprint.

The largest proposed cut areas are associated with the proposed buildings, deeper utilities, and slopes the north and south of the proposed buildings. Based on the top of observed Bedrock information from the test pits, rock excavation of up to about 5 feet may be required in the southeast portion of the headquarters building, the northeast corner of the maintenance building and the southeast corner of the proposed maintenance building, to reach proposed foundation bearing elevations. Rock excavation up to about 5 feet may be required within the parking and drive areas to the north and south the proposed buildings and up to about 10 feet of rock excavation may be required in the sloped area south of the maintenance building. Deeper rock excavations are anticipated for some utilities, especially to the south of the proposed headquarters building where the refusal was encountered above proposed pavement grade. Rock removal will require blasting or chipping of bedrock in this area. The blasted or chipped rock may be processed off site and reused as Structural Fill, provided it meets the gradation requirements in **Table 2**. Note that the City of Woburn does not allow crushing or processing of rock on site. Careful blast design will be required to help control vibrations and limit the potential for blast-induced ground vibrations from causing damage to adjacent structures. Project specifications should provide performance requirements for the blasting contractor.

GEOTECHNICAL RECOMMENDATIONS

The geotechnical design and construction recommendations presented below are based on GZA's evaluation of the available subsurface data and preliminary development plans and are subject to the limitations in Appendix A. References to the IBC refer to the International Building Code 2015 with Massachusetts State Building Code 9th Edition (MSBC) amendments (2018).

Design

Building Foundations

The existing Topsoil, Subsoil and fill (if any) are not considered suitable for support of proposed building foundations. Building loads may be supported on spread footing foundations bearing on undisturbed, natural Sand and Gravel, Glacial Till, Weathered Rock, or Bedrock, or on compacted Structural Fill (refer to **Table 2** for gradation) placed over the undisturbed natural soils after removal of existing topsoil, subsoil and fill (if any). The footings should be designed with a maximum net allowable bearing pressure for foundations on the different strata in accordance with the following:

- Sound to slightly weathered Bedrock — 8 tons/square foot (tsf)
- Undisturbed Glacial Till or Weathered Rock — 5 tsf
- Undisturbed, Natural Sand/Sand and Gravel — 3 tsf
- Compacted Structural Fill — 3 tsf

In portions of the building where it is uncertain what the bearing material will be, we suggest designing foundations for 3 tsf. 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. For footings bearing entirely on rock, continuous wall footings should be at least 12 inches wide; isolated footings at least 18 inches wide.

For frost protection, exterior footings and interior footings in unheated areas bearing on soil 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. If sound to slightly weathered bedrock is encountered at or above footing subgrade, and the bedrock can be prepared such that the bedrock is approximately level, competent and intact, footings may bear directly on the rock at a depth of least 2½ feet below final exterior grades, provided water is unable to pool between the bottom of the footing and the bedrock surface.

A transition zone should be provided for continuous footings where the foundation subgrade changes from soil to bedrock. The transition zone should be constructed by excavating bedrock to 12 inches below the bottom of footing at the change in bearing material. Taper this bedrock excavation to 6 inches below the footing at 10 feet laterally from the subgrade change and backfill with compacted Sand-Gravel Fill. Alternatively, provide a vertical construction joint in the foundation and building wall at the location of the subgrade change and/or provide additional reinforcement in the footing at the change in bearing material to reduce uncontrolled cracking. Where footings will bear directly on rock, the bearing surface should be excavated essentially level or to within approximately 15 degrees of horizontal. Continuous wall footings on rock should be at least 12 inches wide and isolated footings at least 18 inches wide. Individual column footings should bear entirely on soil or entirely on bedrock.

We recommend that lateral loads be resisted by sliding friction between the base of the spread footings and subgrade soils. Foundations should be designed using a friction factor against base shear of 0.4. The factor of safety against sliding should be at least 1.5.

Footing subgrade preparation recommendations are included in the Construction section of this report below.

Building Slab

We recommend slab-on-grade construction for the building slabs, provided that subgrade preparation is performed in accordance with the recommendations of this report. A 6-inch-thick base course layer of compacted Sand and Gravel, with a gradation as recommended herein, should be placed immediately below the slab.

Settlement

Total and differential settlements are anticipated to be less than 1-inch and ½-inch, respectively, provided foundations are designed and constructed as recommended herein.

Lateral Earth Pressures

Buried building foundation walls or site retaining walls (if any) subjected to unbalanced earth-loading conditions should be designed to resist lateral earth pressures. Design lateral earth pressures behind cast-in-place walls should be calculated using the following equivalent fluid unit weights:

- flexible (cantilever) walls 45 pounds/cubic foot (pcf)
- rigid walls (restrained at the top) 65 pcf

These values are for horizontal backfill and assume 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. Where the calculated earth pressure behind the wall 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. This pressure does not account for large construction equipment such as cranes and concrete trucks.

If site retaining walls are constructed as Mechanically Stabilized Earth (MSE) or Modular Block walls, we recommend the following parameters be used to calculate earth pressures:

	Minimum Unit Weight pcf	Maximum Friction Angle deg	Cohesion psf
Reinforced Zone	130	34	0
Retained Zone	120	30	0

The reinforced zone should consist of off-site Sand-Gravel fill; the retained zone consists of on-site soils.

Slope Stability

Permanent Seeded Slopes

Permanent soil slopes with a loamed-and-seeded surface should not be steeper than 3-horizontal to 1-vertical (3H:1V) without special treatment. If steeper slopes are utilized there is potential that localized sloughing may occur in slopes containing predominantly silty soils. Slopes using 2H:1V geometry should receive a drainage blanket to improve slope drainage. Fill soils placed in 2H:1V sloped areas should be gravelly and free draining and the owner should expect localized sloughing to occur before vegetation is established. Sloughed areas may be difficult to access for repair or maintenance. In no areas should soil slopes be steeper than 2H:1V, unless a stacked boulder or blast rock slope which may be at a 1H:1V.

GZA previously provided recommendations for a stacked boulder or blast rock slope. A 6 to 12-inch thick layer of 3-inch trap rock (angular rock, maximum dimension of 3 inches) over at least 6 inches of ¾-inch Crushed Stone or Dense Graded Crushed Stone (MassDOT material M2.01.7) should be provided below the stacked boulders to provide a filter between the onsite soils and the boulders. Drainage should be provided at the top and at the bottom of the stacked boulder slope.

Bedrock Face Slopes

Rock slopes are anticipated in a portion of the landscaped area south of the proposed buildings, especially in the areas of TP-101 and TP-104. If bedrock face slopes are included in the design, we recommend presplitting the final bedrock face. Presplitting is where the bedrock is drilled in a line at the cut angle every approximately 2 feet before blasting. This produces a near-planar face and results in less slope maintenance removing rock that is loosened due to freeze-thaw cycles. Although initially more expensive than blasting to an uncontrolled finish face, presplitting can save on the cost of maintenance of the rock face. Final means and methods for bedrock face work should be coordinated with the geotechnical engineer.

Exposed bedrock faces should be no steeper than 1H:6V. Every 15 feet of rock height should have a 10-foot-wide bench to help mitigate possible rock fall and a buffer swale at the base of the slope at least 10 feet in width.

Subsequent to blasting, final bedrock slopes should be observed by a qualified geotechnical engineer for conditions that may require additional support, such as rock bolts, to stabilize the face for long term exposure to the elements.

Pavement Design

The following pavement cross-sections are recommended for new proposed parking areas and roads:

	Minimum Thicknesses	
	Car Parking	Truck Loading
Finish Course	1½ inches	1½ inches
Binder Course	1½ inches	2½ inches
Sand-Gravel Base Course	10 inches	14 inches

Bedrock should be at least 2 feet below bottom of pavement with the base course extending to the bedrock.

Seismic Design

We recommend Site Class C be used for seismic design. In accordance with the MSBC, GZA recommends that the structures be designed using the following parameters:

S_S = 0.226	S_1 = 0.071
S_{DS} = 0.181	S_{D1} = 0.080

where:

S_S and S_{DS} are the spectral acceleration and design spectral response acceleration parameters at 0.2-second period, respectively, and

S1 and S_{D1} are the spectral acceleration and design spectral response acceleration parameters at 1.0-secon period, respectively.

Construction

Building Subgrade Preparation

Remove existing topsoil and existing fill (if any) from within the building footprint and below footings in a zone defined by a 1 horizontal to 1 vertical (1H:1V) line sloping downward from 1 foot outside the bottom edge of footings, intersecting undisturbed, natural Sand and Gravel, Glacial Till, Weathered Rock or Bedrock. Where blasting is performed to remove bedrock, loose bedrock or nested blasted rock fragments should be removed from within the bearing zone of building foundations, and at least 5 feet beyond the outside edge of footings around the perimeter of buildings. Over-excavation of loose bedrock should be backfilled with compacted Structural Fill.

Where practical, final footing and slab excavations should be performed using a smooth-edged bucket to limit disturbance of the soil subgrade. Final granular subgrade areas should be proof compacted prior to placement of footings or Structural Fill with at least 6 passes of a minimum 10,000 pound (minimum static weight) vibratory roller. In confined areas, proof-compact with a minimum of 6 passes of a large vibratory plate compactor or walk-behind vibratory drum roller. Where subgrades are at or near the groundwater level, static proof-compaction methods may be used in lieu of vibratory methods and at the acceptance of the geotechnical engineer. Weak and unstable areas observed during proof-compaction should be over-excavated and replaced with compacted Structural Fill (Granular Fill, Sand-Gravel, or ¾-inch Crushed Stone; Crushed Stone should be wrapped in non-woven filter fabric when thicker than 4 inches).

Footing and slab subgrades should be protected from frost at all times during construction. We recommend that a qualified geotechnical engineer evaluate the subgrade for suitability for foundation support and to monitor proof-compaction and subsequent fill placement and compaction.

Bedrock Removal

Blasting will be necessary to achieve proposed grades for portions of the proposed buildings, parking areas and some utilities. Based on the recent test pits, rock appears to be above proposed final grades to the northwest of the proposed maintenance

building, to the northeast of the proposed fire headquarters building, within the proposed driveway east of the buildings, and along the proposed slope to north of the proposed parking lot west of the buildings. Perform all blasting in compliance with Commonwealth of Massachusetts and City of Woburn regulations. These regulations include blast size restrictions, vibration limits and vibration monitoring requirements. In addition, GZA recommends pre-construction surveys of existing structures within at least 100 horizontal-feet of the blast areas to document existing conditions.

Where bedrock excavation is required to accommodate proposed slabs, pavement, or utilities, over-excavate bedrock to at least 12 inches below the bottoms of slabs, 2 feet below proposed pavement, and at least 6 inches below utility inverts. Backfill to bottoms of slab and pavement with compacted Sand and Gravel. Place and compact appropriate bedding material for utility pipes as recommended by the manufacturer. If footing areas, remove bedrock to 6 inches below proposed footing and backfill with compacted Granular Fill or, alternatively, footings may be constructed directly on the bedrock subgrade provided loose rock is removed and the rock is relatively level.

Subsequent to blasting, final bedrock faces in landscape areas (if any) should be observed by a qualified geotechnical engineer to identify potential areas of instability in rock faces. This inspection should identify any rock block or wedges which are potentially unstable. A catchment area should be provided at the base of rock slopes.

Pavement Subgrade Preparation

Soil Subgrade – Remove all topsoil, roots and debris from proposed pavement areas. Subsoil and fill (if any) may be left below the proposed pavement base course, provided the subgrade is stable when 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. Remove organic soils if encountered at subgrade level.

Bedrock Subgrade - If bedrock excavation is required under pavement, over excavate bedrock to at least 2 feet below the bottom of pavement section, to limit frost wedging action over time. Backfill with compacted Sand and Gravel. Place and compact appropriate bedding material for utility pipes as recommended by the manufacturer.

Materials and Placement

Recommended gradations for off-site fill materials are provided in **Table 2**. Structural Fill consists of off-site Granular Fill, Sand-Gravel, or Crushed Stone or granular onsite material provided it does not contain organics or debris and can be compacted to the required degree of compaction.

The recommended minimum degree of compaction of soils, based on percentage of maximum dry density as defined by ASTM D-1557 Method C, is specified below for different areas.

Fill Area	Percent of Maximum Dry Density
Beneath Landscaped Areas	90
Within and Adjacent to Building Areas	95
Backfill around Grade Beams	95
Pavement and Sidewalk Base Course	95
Below Pavement and Sidewalk Base Course	92

Crushed Stone should be placed in lift thickness no greater than 6 inches and be compacted to an unyielding surface. Recommended maximum loose lift thickness for fill and minimum number of passes of compaction equipment for structural fill materials are provided in **Table 3**.

Compaction within 5 feet of building walls should be performed using a hand-operated vibratory roller or plate compactor. Backfill and compact all fills at approximately similar elevations on each side of foundation walls to avoid unbalanced loading. Concrete footings and slabs, as well as footing and slab subgrades, should be protected from frost at all times. Fill should not be placed over frozen soil.

Reuse of On-Site Materials

Based on laboratory gradation analyses and on the requirements in **Table 2**, the on-site soils do not meet the requirements of Granular or Structural Fill and, due to a relatively high silt content, will be difficult to reuse, especially in cold and/or wet weather. We understand that the City has decided not to reuse on-site soils within the building footprints and pavement areas However, where specifically shown on the Contract Documents, it may be possible to reuse silty materials as backfill in non-critical and landscaped areas.

Construction Dewatering

Groundwater is not expected to be encountered during excavation for proposed slab-on-grade or foundation areas but may be encountered during deep utility excavations. Temporary control measures should be implemented to reduce surface water (from rainfall runoff) from potentially entering and ponding within excavated areas. Temporary measures should include, but not be limited to, construction of drainage ditech or berms to divert and/or reduce the amount of surface water flowing over exposed subgrades during construction.

In areas of rock excavation, potentially water bearing joints or fractures in the rock may exist. Due to the existing site grades, these are not expected to reflect a static water table, but water which is trapped within these features, or water that is perched on the bedrock surface.

In addition, water will pond in excavations due to precipitation events. We anticipate that dewatering can be accomplished with the use of localized sumps and pumps. Discharge of pumped water should be in accordance with local, state and federal regulations.

Excavation Slopes and Shoring

The Contractor should be aware of and be familiar with applicable local, state and federal safety regulations, including current Occupational Safety and Health Administration (OSHA) Construction Industry Standards. Construction site safety is the sole responsibility of the Contractor, who is also solely responsible for the means, methods and sequencing of construction operations.

Excavations should be in accordance with OSHA Standards. Where in bedrock, it is likely the earthwork and/or blasting contractor will classify the site bedrock as “Stable Rock” when applying the OSHA regulations. OSHA allows the use of up to vertical excavations in “Stable Rock.” Subsequent to blasting and excavation the rock face should be observed by a qualified geotechnical engineer to identify potential areas of instability in the rock face.

The existing site glacial till and weathered rock may be considered Type B soils. Excavations in these soils should be sloped at 1H:1V, or flatter. The existing subsoil and sand/sand and gravel soils are considered Type C soils; excavations in these soils should be sloped at 1.5H:1V, or flatter. As a safety measure, it is recommended that all vehicles and soil piles be kept at least a 10-foot lateral distance away from the top edge of excavations.

FINAL DESIGN AND CONSTRUCTION SERVICES

As the project approaches final design, we recommend that we be retained to prepare specifications for earthwork and blasting, and review/comment on near-final foundation plans to assist with implementation of our geotechnical recommendations.

During construction, we recommend GZA be engaged to observe foundation and site earthwork construction (including observation of foundation and slab subgrade preparation, blasting, vibration monitoring, and site earthwork) for compliance with our recommendations, the contract foundation plans, and specifications. In addition, backfilling within the building area should be monitored for compaction and gradation control.

We appreciate the opportunity to assist you on this phase of the project and look forward to assisting you as it moves toward final design. Please contact Mary Hall at (617) 963-1001 should you have any questions.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Mary B. Hall, P.E
Senior Principal

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

Attachments: Tables
Figure
Appendix A – Limitations
Appendix B – Test Pit Logs
Appendix C – Geotechnical Laboratory Testing Data

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Tables

SUMMARY OF SUBSURFACE CONDITIONS

TABLE 1
Proposed Woburn Fire Department Headquarters
729-749 Main Street
Woburn, Massachusetts

Exploration ID	Ground Surface Elevation (ft)	As Excavated Location (MSP Coordinate System, Mainland Zone)		Strata Thickness (ft)					Refusal Depth (ft)	Refusal Elevation (ft)	Depth to Water (ft)	Notes
		Northing	Easting	Topsoil	Subsoil	Sand/Sand and Gravel	Glacial Till	Weathered Bedrock				
TP-1	113	749035.96	3006371.92	1.0	NE	11.0	NE	NE	*<12*	*<101*	NE	
TP-2	113	749006.39	3006351.15	1.0	NE	9.4	NE	NE	*<10.4*	*<102.6*	NE	
TP-3	117	749138.60	3006365.37	0.7	1.1	NE	5.4	NE	**7.2**	**109.8**	NE	4
TP-4	110	749174.03	3006260.09	1.3	0.9	6.8	NE	NE	**9.0**	**101.0**	8.5	3,4
TP-5	123	749158.61	3006144.48	0.8	3.2	NE	1.3	NE	**5.3**	**117.7**	NE	4
TP-6	114	749086.20	3006142.94	0.9	1.3	NE	5.0	NE	**7.2**	**106.8**	NE	4
TP-7	108.5	749257.85	3006401.69	1.0	3.0	NR	6.0	NE	**10.0**	**98.5**	9.8	3,4
TP-8	121	749074.93	3006413.24	0.6	2.1	5.7	NE	NE	**8.4**	**112.6**	NE	4
TP-9	114.5	749123.71	3006410.74	0.9	1.5	9.9	NE	NE	*<12.3*	*<102.2*	NE	
TP-10	115	749052.07	3006233.00	0.3	1.2	5.5	2.0	NE	**9.0**	**106.0**	NE	4
TP-11	127	749275.39	3006272.29	0.7	2.1	NE	8.9	NE	**11.7**	**115.3**	NE	5
TP-12	125	749237.28	3006233.42	1.0	1.4	NE	9.6	NE	*<12*	*<113*	NE	
TP-13	118	749212.11	3006234.41	0.7	2.4	NE	8.9	NE	*<12*	*<106*	NE	
TP-14	122	749220.78	3006209.62	0.9	1.8	3.3	2.2	NE	**8.2**	**113.8**	NE	4
TP-15	121.5	749208.73	3006173.04	1.0	2.0	NE	4.9	NE	**7.9**	**113.6**	NE	4
TP-16	110	749037.95	3006177.91	1.0	1.0	NE	10.0	NE	*<12*	*<98*	11.9	3
TP-17	112	749049.89	3006127.08	0.7	2.3	NE	3.7	NE	*<6.7*	*<105.3*	NE	5
TP-18	115.5	749073.53	3006098.51	0.8	1.2	2.2	NE	3.0	**7.2**	**108.3**	NE	4
TP-19	118	749193.12	3006396.60	1.1	1.1	2.0	1.3	1.6	**7.1**	**110.9**	NE	4
TP-20	115	749084.45	3006501.76	0.8	3.9	NE	4.7	NE	**9.4**	**105.6**	NE	5
TP-21	126	749150.64	3006496.90	0.9	2.5	NE	5.3	NE	**8.7**	**117.3**	NE	5
TP-22	124	749163.09	3006425.62	0.7	2.0	NE	3.6	NE	**6.3**	**117.7**	NE	4
TP-23	114.5	749202.59	3006351.53	0.7	2.0	1.1	1.8	NE	*<5.3*	*<109.2*	NE	2
TP-24	115	749207.46	3006301.52	0.7	1.5	2.0	2.2	NE	*<6.4*	*<108.6*	NE	2
TP-25	110	749079.06	3006326.93	0.9	1.1	NE	1.1	NE	**3.1**	**106.9**	NE	4
TP-26	115.5	749163.00	3006189.95	0.6	1.4	1.5	0.5	NE	**4.0**	**111.5**	NE	4
TP-27	116.5	749118.69	3006153.30	0.5	2.7	NE	2.8	NE	*<6*	*<110.5*	NE	2
TP-28	115.0	749132.06	3006290.79	0.6	1.4	NE	2.0	NE	*<4*	*<111*	NE	2
TP-29	117.5	749253.07	3006339.76	0.7	2.0	NE	1.8	NE	*<4.5*	*<113*	NE	2
TP-30	112.5	749097.39	3006210.23	0.7	2.3	NE	1.1	NE	*<4*	*<108.5*	NE	2
TP-31	113	749136.97	3006208.17	0.5	1.0	1.3	1.4	NE	*<4*	*<109*	NE	2
TP-101	134	749265.87	3006221.33	0.5	2.0	NE	3.0	NE	**5.5**	**128.5**	NE	4
TP-102	125	749234.62	3006178.27	0.5	1.5	NE	6.5	NE	**8.5**	**116.5**	NE	5
TP-103	124	749207.54	3006148.76	0.5	2.5	NE	8.2	NE	**11.2**	**112.8**	NE	5
TP-104	129	749171.42	3006117.51	0.5	2.0	2.5	4.5	NE	**9.5**	**119.5**	NE	4
TP-105	120	749166.97	3006165.83	0.5	3.5	NE	6.5	NE	*<10.5*	*<109.5*	NE	3,6
TP-106	125	749131.84	3006095.63	0.5	2.5	NE	9.0	NE	**12.0**	**113.0**	NE	5
TP-107	119	749098.50	3006087.35	0.5	3.0	NE	10.5	NE	*<14*	*<105*	14	3
TP-108	133	749187.09	3006443.48	0.5	2.0	3.5	2.0	NE	**8.0**	**125.0**	NE	4
TP-109	120	749129.58	3006461.85	0.5	3.0	NE	5.0	NE	**8.5**	**111.5**	NE	4
TP-110	114	749064.01	3006453.44	1.5	4.5	NE	6.3	NE	*<12.3*	*<101.7*	12	3,6
TP-111	115	749022.80	3006464.75	0.5	NE	11.5	NE	NE	*<12*	*<103*	NE	

Notes:
1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Test pit terminated in glacial till bearing stratum to limit disturbance of natural soils. Refusal not encountered.
3. Groundwater encountered in the test pit during excavation.
4. Refusal encountered on apparent bedrock (refusal depth/elevation in bold and shaded gray).
5. Refusal encountered on large boulders or bedrock (refusal depth/elevation in bold; not shaded).
6. Test pit terminated due to excavation walls collapsing. Refusal not encountered.

Abbreviations:
NE = Not Encountered

TABLE 2

RECOMMENDED USE AND GRADATION CRITERIA FOR FILL MATERIALS

Proposed Woburn Fire Department Headquarters
729-749 Main Street
Woburn, Massachusetts

USE OF FILL MATERIAL

Granular Fill:	Below footings and slab base course.
Sand-Gravel:	Slab base course, below footings, and as backfill within three feet laterally of walls.
Crushed Stone:	For use in bottom of excavations to aid in construction dewatering, maintaining subgrade stability, and backfill behind walls in confined 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	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

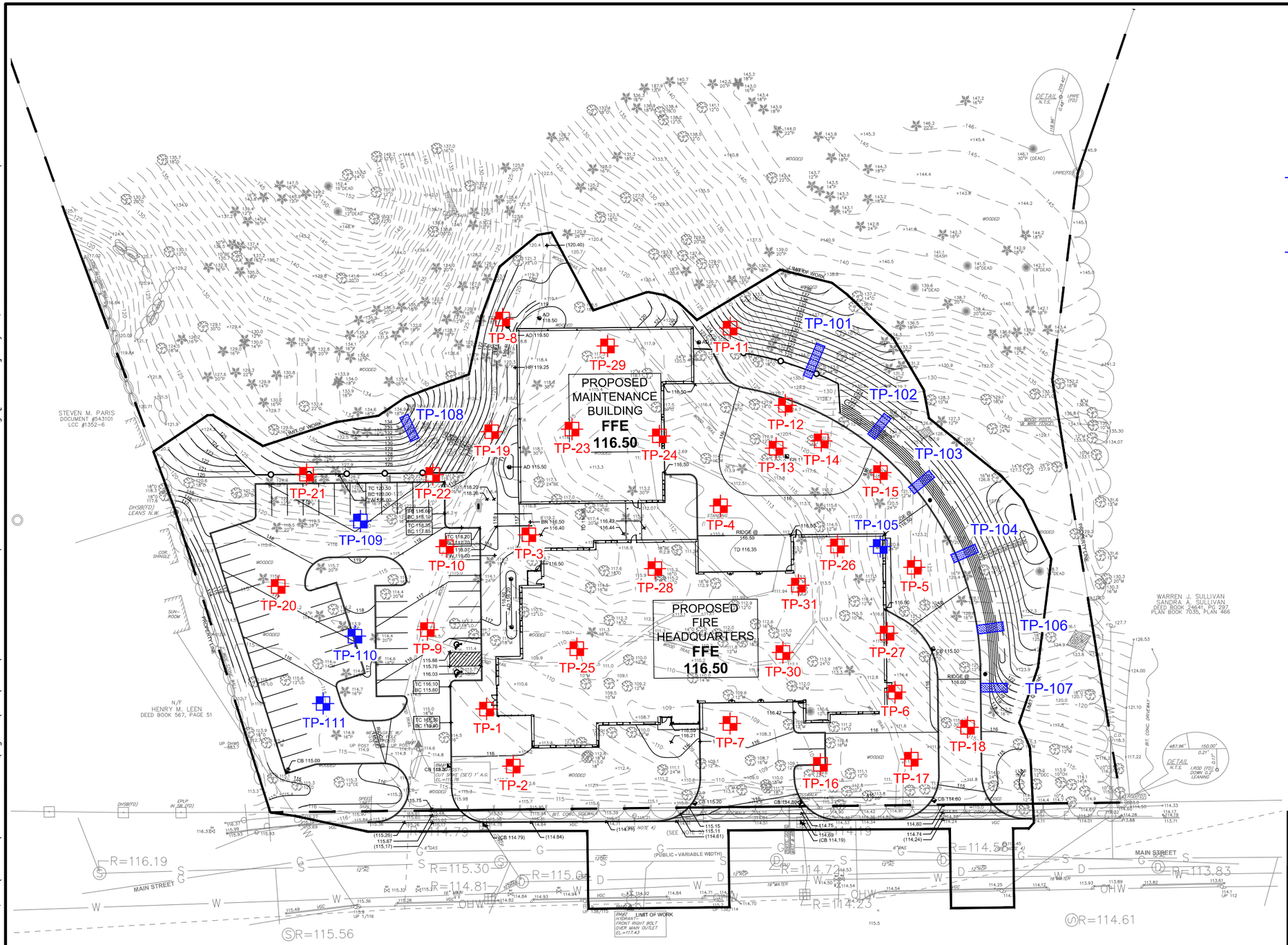
TABLE 3

COMPACTION METHODS
Woburn Fire Headquarters
729-749 Main Street
Woburn, Massachusetts

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 lb in confined areas	6"	10"	12"	4	4
Light vibratory drum roller minimum weight minimum dynamic at drum 3,000 lb force 10,000 lb	8"	12"	18"	4	4
Medium vibratory drum roller minimum weight minimum dynamic at drum 10,000 lb force 20,000 lb	8"	18"	24"	6	6

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

Figures



LEGEND

TP-1 — TEST PITS PERFORMED BY CRYAN LANDSCAPE, INC. OF ATTLEBORO, MASSACHUSETTS BETWEEN SEPTEMBER 19, AND 23, 2019. OBSERVED AND LOGGED BY GZA PERSONNEL.

TP-105 — TEST PITS PERFORMED BY CRYAN LANDSCAPE, INC. OF ATTLEBORO, MASSACHUSETTS ON APRIL 16 AND 17, 2020. OBSERVED AND LOGGED BY GZA PERSONNEL.

TP-107 — TEST TRENCHES PERFORMED BY CRYAN LANDSCAPE, INC. OF ATTLEBORO, MASSACHUSETTS ON APRIL 16 AND 17, 2020. OBSERVED AND LOGGED BY GZA PERSONNEL.

GENERAL NOTES

1. THE BASE MAP WAS DEVELOPED FROM "GRADING PLAN" BY DINISCO DESIGN DATED OCTOBER 1, 2019.
2. TEST PIT TP-108 LOCATION WAS APPROXIMATELY DETERMINED BY TAPE MEASUREMENTS FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED
3. THE REMAINING TEST PITS AND TRENCHES WERE LOCATED BY HANDHELD GPS, THESE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHODS USED.

N

0 30 60 120

SCALE IN FEET

© 2020 – GZA GeoEnvironmental, Inc.
GZA–\\gzanor\Jobs\170,000–179,999\174360\174360–20.HLA\Figures\CAD\DWGs\01.0174360.20–F2 Exploration Location Plan.dwg [FIGURE 2] May 01, 2020 – 11:04am alexander.perez

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WOBURN FIRE DEPARTMENT HEADQUARTERS
729-749 MAIN STREET
WOBURN, MASSACHUSETTS 02421

EXPLORATION LOCATION PLAN

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		DINISCO DESIGN PARTNERSHIP	
PROJ MGR: HA	REVIEWED BY: MBH	CHECKED BY: BWF	FIGURE
DESIGNED BY: HA	DRAWN BY: AJP	SCALE: AS SHOWN	
DATE: MAY 2020	PROJECT NO. 01.0174360.20	REVISION NO.	1

Appendix A – Limitations

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client, Dinisco Design, for the stated purpose(s) and location(s) identified in the Proposal for Services 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 contract documents, 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 work conducted as part of the Scope of Services set forth in Proposal for Services 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 .

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 and are intended only to convey trends in subsurface conditions. 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. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. In preparing this report, GZA relied on certain information provided by the 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 pits (as described in this Report) at the specified times and under the stated conditions. 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. Consequently, we did not consider 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 – Test Pit Logs

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachuetts

Test Pit No.	TP-1
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

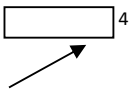
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	113
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	0722
		Capacity	1 CY	Reach	15 FT	Time Completed	0800

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	Dark brown, fine to coarse SAND, some Silt, little Gravel, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1'						
2'				E	2A	2
3'				E/M	3A	
4'				E/M	3A	
5'	Brown, GRAVEL and fine to coarse SAND, little Cobbles, little Silt to fine to coarse SAND and GRAVEL, little Cobbles, trace Silt. (SAND and GRAVEL)			E/M	4A	
6'				E/M	5A	3
7'				E/M	3A	
8'				E/M	1A	
8.2'				E/M	0	
9'				E/M	0	
10'	Brown, fine to coarse SAND, little Gravel, trace Cobbles, trace Silt. (SAND)			E/M	0	
11'				E/M	0	
12'	12'			E/M	0	4,5
13'	Bottom of Test Pit at 12 feet below ground surface.					
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 1.5 feet below ground surface (bgs).
3. Slight orange stained soil mottling observed at approximately 6 to 7 feet bgs.
4. Moisture observed in soil from approximately 11 to 12 feet bgs.
5. Test pit terminated at approximately 12 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
	See note 3

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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729-749 Main Street
Woburn, Massachuetts

Test Pit No.	TP-2
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

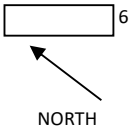
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	113
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	0802
		Capacity	1 CY	Reach	15 FT	Time Completed	0845

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	Dark brown, SILT, some fine to medium Sand, trace Gravel, trace Roots, trace Wood.					
1'	1' (TOPSOIL)			E	1A	1,2
2'				M	7A	
3'				M	8A,1B	
4'				E/M	3A	
5'				E/M	3A	
6'	Brown, GRAVEL, some fine to coarse Sand, trace Cobbles, trace Silt to fine to coarse SAND, some Gravel, trace Cobbles, trace Silt.			E/M	1A	
7'	(SAND and GRAVEL)			E/M	2A	3
8'				E/M	1A	
9'				E/M	2A,1C	
10'				E/M	1A,1B	
11'	10.4' Bottom of Test Pit at 10.4 feet below ground surface.			E/M	0	4
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 1 foot below ground surface (bgs).
3. Orange stained soil mottling observed at approximately 7 feet bgs.
4. Test pit terminated at approximately 10.4 feet bgs due to multiple sidewall collapses. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
	See note 3

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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GeoEnvironmental, Inc.
Engineers/Scientists
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Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachuetts

Test Pit No.	TP-3
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	117
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	0851
		Capacity	1 CY	Reach	15 FT	Time Completed	0922

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.7'	Dark brown, SILT, little fine to coarse Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1.8'	Brown, GRAVEL, some fine to coarse Sand, some Silt, trace Roots. (SUBSOIL)			E	2A	2
3'	Brown, GRAVEL and fine to coarse SAND, little Cobbles, little Silt. (TILL)			E/M	3A	
4'				M/D	2A	
5'				M/D	1A	
6'				D	1A	
7'				D	2A	
7.2'	Refusal at 7.2 feet below ground surface.			D	2A	3
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 1.7 feet below ground surface (bgs).
3. Test pit terminated at approximately 7.2 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan

15 × 4

NORTH

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachuetts

Test Pit No.	TP-4
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

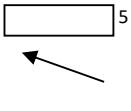
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	110
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	0948
		Capacity	1 CY	Reach	15 FT	Time Completed	1015

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	Dark brown, SILT, trace Roots, trace Leaves. (TOPSOIL)			E	1B	1
	1.3'					
2'	Brown to gray, Clayey SILT, trace fine to medium Sand. (SUBSOIL)			E	2A	2
	2.2'					
3'				E	0	
4'				E	0	3
5'				E	0	
6'	Brown, fine to medium SAND, trace Cobbles, trace Silt. (SAND)			E	0	
7'				E	0	
8'				M	1C,2A	
	9'			D	0	4,5
9'	Refusal at 9 feet below ground surface.					
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 1.3 feet below ground surface (bgs).
3. Orange stained soil mottling observed from approximately 3.2 to 3.8 feet bgs.
4. Groundwater observed seeping through test pit sidewalls at approximately 8.5 feet bgs.
5. Test pit terminated at approximately 9 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
0.2	8.5

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Proposed Woburn Fire Dept. HQ
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Woburn, Massachuetts

Test Pit No.	TP-5
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

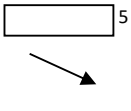
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	123
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	1044
		Capacity	1 CY	Reach	15 FT	Time Completed	1114

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.8'	Dark brown, SILT, some fine to medium Sand, trace Roots, trace Leaves. (TOPSOIL)			E	1B,1A	1
1'				M	4A	
2'	Brown, SILT, and fine to coarse SAND, little Cobbles, trace Roots. (SUBSOIL)			D	10+A, 1B	2
3'				D	10+A	
4'				D	10+A	
4'	Light brown, fine to coarse SAND and GRAVEL, little Cobbles, little Silt. (TILL)			D	0	3
5'						
5.3'	Refusal at 5.3 feet below ground surface.					
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.7 feet below ground surface (bgs).
3. Test pit terminated at approximately 5.3 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Woburn, Massachuetts

Test Pit No.	TP-6
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

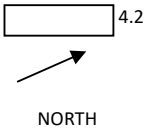
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	114
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	1122
		Capacity	1 CY	Reach	15 FT	Time Completed	1155

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.9'	Dark brown, SILT, trace fine to medium Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1'						
2'	Brown, SILT, some fine Sand, trace Gravel, trace Roots. (SUBSOIL)			E	0	
2.2'				E/M	2A	2
3'						
4'				M	1B,2A	
5'	Light brown, fine to coarse SAND and GRAVEL, little Cobbles, little Silt. (TILL)			D	5A,1C	
6'				D	5A	
7'				D	5A	
7.2'	Refusal at 7.2 feet below ground surface.			D	0	3
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3 feet below ground surface (bgs).
3. Test pit terminated at approximately 7.2 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Woburn, Massachuetts

Test Pit No.	TP-7
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

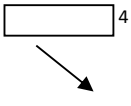
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	108.5
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	1201
		Capacity	1 CY	Reach	15 FT	Time Completed	1515

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	Dark brown, SILT, little fine to medium Sand, trace Roots, trace Leaves. (TOPSOIL)			E	1A	1
2'	Brown, SILT, little fine Sand, trace Gravel, trace Roots. (SUBSOIL)			E	0	
3'				E	0	
4'				E	0	2,3,4
5'	Brown, fine to coarse SAND, some Gravel, little Cobbles, trace Silt. (TILL)			M	0	
6'				M	1A	5
7'				M	0	
8'				M	0	
9'				D	3A	
10'				D	3A	6,7
11'	Refusal at 10 feet below ground surface.					
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 4 feet below ground surface (bgs).
3. Excavation temporarily stopped at 1235.
4. Excavation resumed at 1456.
5. Slight orange stained soil mottling observed from approximately 4 to 5 feet bgs.
6. Groundwater observed seeping through test pit sidewalls at approximately 9.8 feet bgs.
7. Test pit terminated at approximately 10 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
0.2	9.8

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Engineers/Scientists
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Boston, MA 02109

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729-749 Main Street
Woburn, Massachuetts

Test Pit No.	TP-8
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

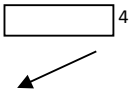
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	121
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	1255
		Capacity	1 CY	Reach	15 FT	Time Completed	1335

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.6'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1'				E	0	
2'	Brown, fine to medium SAND and SILT, trace Roots. (SUBSOIL)			E	0	
2.7'				E	0	
3'				E	0	2
4'	Brown, fine to medium SAND, some Silt, trace Roots. (Silty SAND)			E	0	
5'				E/M	0	
5.7'				M	1C	
6'	Brown, fine to medium SAND, some Silt, little Gravel, trace Cobbles. (Silty SAND)			D	5A	
7'				D	1B,3A	3
8'						
8.4'	Refusal at 8.4 feet below ground surface.					
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 4 feet below ground surface (bgs).
3. Test pit terminated at approximately 8.4 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Woburn, Massachuetts

Test Pit No. TP-9
Page No. 1 of 1
File No. 01.0174360.00
Checked By: MBH

GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	114.5
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	1339
		Capacity	1 CY	Reach	15 FT	Time Completed	1410

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.9'	Dark brown, SILT, some fine to medium Sand, trace Roots, trace Leaves. (TOPSOIL)	S-1		E	0	1
2.4'	Brown, fine to coarse SAND, some Gravel, little Cobbles, trace Silt, trace Roots. (SUBSOIL)			E	0	
9.5'	Light brown, fine to medium SAND and SILT, trace Gravel, trace Cobbles, trace Roots. (Silty SAND)			E	0	
12.3'	Brown, fine to coarse SAND, little Gravel, little Cobbles, trace Silt. (SAND)			E/M	0	2
	Bottom of Test Pit at 12.3 feet below ground surface.			M	0	3

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 5.7 feet below ground surface (bgs).
3. Test pit terminated at approximately 12.3 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
13
4
NORTH

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Test Pit No.	TP-10
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

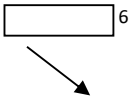
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Constractors, Inc.			Date	9/19/2019
		Operator	Jim Jones			Ground Elev.	115
Weather	Clear, 40 - 60s	Make	CAT	Model	311F	Time Started	1416
		Capacity	1 CY	Reach	15 FT	Time Completed	1453

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
	0.3' Dark brown, SILT and fine to coarse SAND, little Cobbles, trace Gravel, trace Roots. (TOPSOIL)			M	0	1
1'						
	1.5' Brown, fine to coarse SAND, some Cobbles, little Gravel, little Silt, trace Roots. (SUBSOIL)			M	2A	
2'						
				M	0	
3'						
				M	1A,2C	2
4'						
	Light brown, fine to medium SAND, little Silt, trace Gravel, trace Cobbles. (SAND)			M	1C,5A	
5'						
				D	1B,2A	3
6'						
	7'			M/D	3A	
7'						
				M/D	5A	
8'	Brown, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)					
	9'			M/D	2A	4
9'	Refusal at 9 feet below ground surface.					
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 4 feet below ground surface (bgs).
3. Slight orange stained soil mottling observed at approximately 5.5 to 6 feet bgs.
4. Test pit terminated at approximately 9 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
	See note 3

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Woburn, Massachusetts

Test Pit No.	TP-11
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

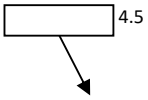
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	127
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	0716
		Capacity	1 CY	Reach	15 FT	Time Completed	0820

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.7' Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1'	Brown, fine to coarse SAND, some Gravel, some Silt, trace Cobbles, trace Roots. (SUBSOIL)			E	2A, 1C	
2'				M	3A	2
3'	2.8'			M	2A, 1B	
4'	Gray, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			M/D	5A	
5'				D	1B, 6A	
6'				D	1B,3A	
7'				D	6A	
8'				D	4A	
9'				D	3A	
10'				D	3A	
11'				D	2A	3
12'	11.7' Refusal at 11.7 feet below ground surface.					
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3 feet below ground surface (bgs).
3. Test pit terminated at approximately 11 feet bgs due to excavator refusal on large boulder, or sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Woburn, Massachusetts

Test Pit No.	TP-12
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

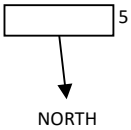
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	125
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	833
		Capacity	1 CY	Reach	15 FT	Time Completed	0918

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	Dark brown, SILT, little fine to coarse Sand, trace Gravel, trace Roots, trace Leaves. (TOPSOIL) 1'			E	0	1
2'	Brown, fine to coarse SAND, some Silt, little Gravel, trace Cobbles, trace Roots. (SUBSOIL)			E/M	3A	
3'	2.4'			M	5A	2
4'				M	2A	
5'				M	3A	
6'				M	2B	
7'				D	3A	
8'	Brown to gray, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	2B, 3A	
9'				D	1B, 3A	
10'				D	2A	
11'				D	3A	
12'	12'			D	2A	3
13'	Bottom of Test Pit at 12 feet below ground surface.					
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.4 feet below ground surface (bgs).
3. Test pit terminated at approximately 12 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Woburn, Massachusetts

Test Pit No.	TP-13
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

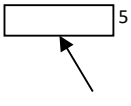
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	118
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	0933
		Capacity	1 CY	Reach	15 FT	Time Completed	1025

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	Dark brown, SILT, little fine to coarse Sand, trace Gravel, trace Roots, trace Leaves.					
0.7'	(TOPSOIL)			E	1B	1
1'	Brown, SILT, little fine to medium Sand, trace Gravel, trace Cobbles trace Roots.			E	1C, 1A	
2'	(SUBSOIL)			E	2A, 1B	
3.1'				M	1C, 3A	2
4'				M	2A	
5'				D	1A	
6'				D	2A	
7'	Brown to gray, fine to coarse SAND and GRAVEL, little Cobbles, little Silt. (TILL)			D	1A	
8'				D	2A	
9'				D	1A, 1B	
10'				D	3A	
11'				D	0	3
12'	12'					
12'	Bottom of Test Pit at 12 feet below ground surface.					
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3.3 feet below ground surface (bgs).
3. Test pit terminated at approximately 12 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Test Pit No.	TP-14
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

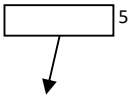
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	122
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	1041
		Capacity	1 CY	Reach	15 FT	Time Completed	1130

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	Dark brown, SILT, little fine to medium Sand, trace Gravel, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
0.9'						
1'	Brown, SILT, some fine to medium Sand, trace Gravel, trace Cobbles, trace Roots. (SUBSOIL)			E	0	
2'						
2.7'				M	2C	
3'	Light brown, fine to medium SAND and SILT, trace Cobbles, trace Gravel. (Silty SAND)			M	1A	2
4'						
5'				D	2B, 2A	
6'				D	2A	
6'	Brown, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	8A	
7'						
8'				D	3A	
8.2'						
9'	Refusal at 8.2 feet below ground surface.			D	3A	3
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 4 feet below ground surface (bgs).
3. Test pit terminated at approximately 8.2 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
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V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Woburn, Massachusetts

Test Pit No. TP-15
Page No. 1 of 1
File No. 01.0174360.00
Checked By: MBH

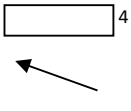
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	121.5
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	1140
		Capacity	1 CY	Reach	15 FT	Time Completed	1210

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
2'	Brown, SILT, some fine to medium Sand, trace Gravel, trace Cobbles, trace Roots. (SUBSOIL)			E	0	
3'	3'			M	1C, 2A	2
4'	Brown, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	2B, 2A	
5'				D	1B, 2A	
6'				D	2A	
7'				D	1A	
8'	7.9'			D	2A	3
9'	Refusal at 7.9 feet below ground surface.					
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.2 feet below ground surface (bgs).
3. Test pit terminated at approximately 7.9 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Boston, MA 02109

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729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-16
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

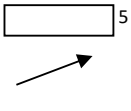
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	110
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	1223
		Capacity	1 CY	Reach	15 FT	Time Completed	1310

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	1' Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
2'	2' Brown, SILT, little fine to coarse Sand, little Gravel, trace Cobbles, trace Roots. (SUBSOIL)			E	0	
3'	Brown, fine to coarse SAND and GRAVEL, little Cobbles, little Silt. (TILL)			E	0	2
4'				M	2A	
5'				D	6A	
6'				D	4A, 1B	
7'				D	5A	
8'				D	10+A	
9'				D	2B, 8A	
10'				D	7A	
11'				D	8A	
12'	12'			D	3A	3,4
13'	Bottom of Test Pit at 12 feet below ground surface.					
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.5 feet below ground surface (bgs).
3. Groundwater observed seeping through test pit side wall at approximately 11.9 feet bgs.
4. Test pit terminated at approximately 12 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
0.2	11.9

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GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
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Test Pit No.	TP-17
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

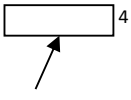
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	112
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	1313
		Capacity	1 CY	Reach	15 FT	Time Completed	1340

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.7'	Dark brown, SILT, trace fine to medium Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1'						
2'	Brown, SILT, little fine to medium Sand, trace Gravel, trace Cobbles, trace Roots. (SUBSOIL)			E	0	
3'				E	1A	
3'				M/D	3A	2
4'						
5'	Brown, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	5A	
6'				D	5A	
6.7'				D	5A	3
7'	Refusal at 6.7 feet below ground surface.					
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 4 feet below ground surface (bgs).
3. Test pit terminated at approximately 6.7 feet bgs due to excavator refusal on a large boulder, or sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Engineers/Scientists
31 State Street, 8th Floor
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Woburn, Massachusetts

Test Pit No.	TP-18
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

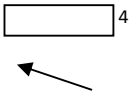
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	115.5
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	1344
		Capacity	1 CY	Reach	15 FT	Time Completed	1415

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.8'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
2'	Brown, SILT, little fine to medium Sand, trace Roots. (SUBSOIL)			E	0	
3'	Brown, SILT and fine SAND, trace Gravel, trace Roots. (Silty SAND)			E	0	
4.2'				M/D	0	2
5'	Brown, GRAVEL, some fine to coarse Sand, some Silt, little Cobbles. (WEATHERED ROCK)			D	3A, 1C	
6'				D	6A	
7.2'				D	0	3
7'	Refusal at 7.2 feet below ground surface.					
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3.1 feet below ground surface (bgs).
3. Test pit terminated at approximately 7.2 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Engineers/Scientists
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Test Pit No.	TP-19
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

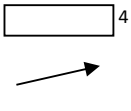
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/20/2019
		Operator	Jim Jones			Ground Elev.	118
Weather	Clear, 40 - 70s	Make	CAT	Model	311F	Time Started	1419
		Capacity	1 CY	Reach	15 FT	Time Completed	1455

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1.1'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
2.2'	Brown, fine to medium SAND, some Silt, trace Gravel, trace Roots. (SUBSOIL)			E	0	2
3'	Light brown, fine to medium SAND, little Gravel, little Silt, trace Cobbles. (SAND)			E	1B, 2A	
4.2'				M	1B, 1A	
5'	Brown, fine to coarse SAND, some Gravel, little Silt, trace Cobbles. (TILL)			M/D	4A	
5.5'				M/D	7A	
6'	Brown, GRAVEL, some fine to coarse Sand, little Cobbles, little Silt. (WEATHERED ROCK)			D	3A	3
7.1'	Refusal at 7.1 feet below ground surface.					
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.2' feet below ground surface (bgs).
3. Test pit terminated at approximately 7.1 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Test Pit No.	TP-20
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

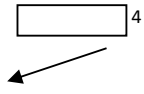
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	115
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	0714
		Capacity	1 CY	Reach	15 FT	Time Completed	0800

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.8'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1'						
2'				E	0	
3'	Brown, SILT, little fine Sand, trace Gravel, trace Roots. (SUBSOIL)			E	0	
4'				E	0	
4.7'				M/D	2A	2
5'				M/D	4A	
6'				D	2B, 5A	
7'	Brown to gray, fine to coarse SAND, some Gravel, little Silt, little Cobbles. (TILL)			D	4B, 7A	
8'				D	1C, 3B, 7A	
9'				D	6A	3
9.4'	Refusal at 9.4 feet below ground surface.					
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 4.6 feet below ground surface (bgs).
3. Test pit terminated at approximately 9.4 feet bgs due to excavator refusal on large boulder, or sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Woburn, Massachusetts

Test Pit No.	TP-21
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

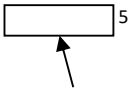
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	126
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	0808
		Capacity	1 CY	Reach	15 FT	Time Completed	0850

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	0.9' Dark brown, SILT, little fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	2A, 1C	1
2'	Brown, SILT, some fine Sand, trace Gravel, trace Cobbles, trace Roots. (SUBSOIL)			M	1B, 4A	
3'				D	5A, 2B	2
4'	3.4' Brown to gray, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	8A	
5'				D	5A	
6'				D	4A	
7'				D	4A	
8'				D	3A	
9'	8.7' Refusal at 8.7 feet below ground surface.			D	1B, 4A	3
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.9 feet below ground surface (bgs).
3. Test pit terminated at approximately 8.7 feet bgs due to excavator refusal on large boulder, or sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Woburn, Massachusetts

Test Pit No.	TP-22
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

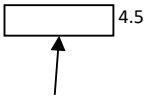
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	124
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	0902
		Capacity	1 CY	Reach	15 FT	Time Completed	0934

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	2A, 1C	1
0.7'						
2'	Brown, SILT, some fine to coarse Sand, little Gravel, trace Cobbles, trace Roots. (SUBSOIL)			M	6A, 1B	
3'				M	2B, 6A	2
2.7'						
4'	Brown, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			M	5A	
5'				M/D	1B, 4A	
6'				D	7A	
6.3'						
7'	Refusal at 6.3 feet below ground surface.			D	0	3
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.7 feet below ground surface (bgs).
3. Test pit terminated at approximately 6.3 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Woburn, Massachusetts

Test Pit No.	TP-23
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	114.5
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	0940
		Capacity	1 CY	Reach	15 FT	Time Completed	1008

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.7'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)	S-2		E	0	1
2.4'	Brown, SILT, little fine Sand, trace Gravel, trace Roots. (SUBSOIL)			E	1A	
3.5'	Light brown, fine SAND, some Silt, trace Gravel, trace Roots. (Silty SAND)			M	4B	
5.3'	Brown, GRAVEL and fine to coarse SAND, some Silt, trace Cobbles. (TILL)			M	3A, 1B	2
				D	3A	
	Bottom of Test Pit at 5.3 feet below ground surface.			D	0	3

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3.7 feet below ground surface (bgs).
3. Test pit terminated at approximately 5.3 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
12
4
NORTH

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-24
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

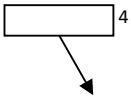
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	115
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	1011
		Capacity	1 CY	Reach	15 FT	Time Completed	1043

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.7'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
2.2'	Brown, SILT, some fine to medium Sand, trace Roots. (SUBSOIL)			M	1C,3A	
4.2'	Brown, fine to medium SAND, some Silt, trace Gravel, trace Cobbles, trace Roots. (Silty SAND)			M	2B, 2A	
				M	2B, 4A	2
				D	2B, 5A	
6.4'	Brown, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	3A	
	Bottom of Test Pit at 6.4 feet below ground surface.			D	1A	3

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3.2 feet below ground surface (bgs).
3. Test pit terminated at approximately 6.4 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-25
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

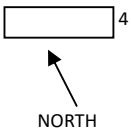
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	110
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	1054
		Capacity	1 CY	Reach	15 FT	Time Completed	1114

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.9'	Dark brown, SILT, little fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
2'	Brown, fine to medium SAND and SILT, little Gravel, trace Cobbles, trace Roots. (SUBSOIL)			M	1A	
3.1'	Brown, fine to coarse SAND, some Gravel, little Silt, trace Cobbles. (TILL)			D	3A	2,3
	Refusal at 3.1 feet below ground surface.					

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.4 feet below ground surface (bgs).
3. Test pit terminated at approximately 3.1 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-26
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

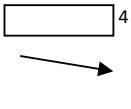
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	115.5
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	1127
		Capacity	1 CY	Reach	15 FT	Time Completed	1153

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
0.6'	Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
2'	Brown, fine SAND and SILT, trace Gravel, trace Roots. (SUBSOIL)			E	1B, 2A	
3.5'	Brown, fine to medium SAND, some Silt, trace Gravel, trace Roots. (Silty SAND)			M/D	2A	
4'	Brown, fine to coarse SAND, some Gravel, little Silt, trace Cobbles. (TILL)			D	2B,2A	2,3
	Refusal at 4 feet below ground surface.					

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3.1 feet below ground surface (bgs).
3. Test pit terminated at approximately 4 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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GeoEnvironmental, Inc.
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31 State Street, 8th Floor
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729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-27
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

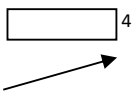
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	116.5
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	1205
		Capacity	1 CY	Reach	15 FT	Time Completed	1240

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, SILT, little fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1'	Brown, fine to medium SAND, some Silt, trace Gravel, trace Cobbles, trace Roots. (SUBSOIL)			M	2B, 3A	
2'				M	2B, 8A	2
3'	3.2'			D	2B, 4A	
4'	Gray to brown, fine to coarse SAND, some Gravel, little Cobbles, trace Silt. (TILL)			D	3B,3A	
5'				D	5A	3
6'	6' Bottom of Test Pit at 6 feet below ground surface.					
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3 feet below ground surface (bgs).
3. Test pit terminated at approximately 6 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
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729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-28
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

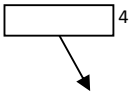
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	115
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	1246
		Capacity	1 CY	Reach	15 FT	Time Completed	1305

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.6' Dark brown, SILT, trace fine Sand, trace Roots, trace Leaves. (TOPSOIL)					
1'				E	0	1
	Brown, fine to coarse SAND and SILT, little Gravel, little Cobbles, trace Roots. (SUBSOIL)					
2'	2'			M	4A	2
				M/D	1B, 8A	
3'	Brown to gray, fine to coarse SAND and GRAVEL, little Cobbles, trace Silt. (TILL)					
4'	4'			D	1B, 7A	3
	Bottom of Test Pit at 4 feet below ground surface.					
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2 feet below ground surface (bgs).
3. Test pit terminated at approximately 4 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
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Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-29
Page No. 1 of 1
File No. 01.0174360.00
Checked By: MBH

GZA Rep. L. Prohaske
Weather Partly Cloudy, 70-80s

Contractor Cryan Landscape Contractors, Inc.
Operator Jim Jones
Make CAT Model 311F
Capacity 1 CY Reach 15 FT

Date 9/23/2019
Ground Elev. 117.5
Time Started 1315
Time Completed 1340

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.7' Dark brown, SILT, little fine Sand, trace Roots, trace Leaves. (TOPSOIL)					
1'				E	0	1
2'	Brown, fine to medium SAND, some Silt, trace Gravel, trace Roots. (SUBSOIL)			E	2A	
3'	2.7'			M	4A, 1B	2
4'	Gray, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			M/D	4A	
5'	4.5' Bottom of Test Pit at 4.5 feet below ground surface.			D	3A	3
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.3 feet below ground surface (bgs).
3. Test pit terminated at approximately 4.5 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
10
4
NORTH

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
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M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
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YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-30
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

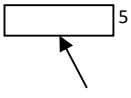
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	112.5
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	1350
		Capacity	1 CY	Reach	15 FT	Time Completed	1415

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.7' Dark brown, SILT, some fine Sand, trace Roots, trace Leaves. (TOPSOIL)			E	1B, 1C	1
1'	Brown, fine SAND and SILT, trace Gravel, trace Roots. (SUBSOIL)			M	2B, 3A	
2'				D	3B,7A	2
3'	3' Gray, fine to coarse SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	5A	3
4'	4.1' Bottom of Test Pit at 4.1 feet below ground surface.					
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 3 feet below ground surface (bgs).
3. Test pit terminated at approximately 4.1 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Engineers/Scientists
31 State Street, 8th Floor
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Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-31
Page No.	1 of 1
File No.	01.0174360.00
Checked By:	MBH

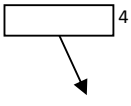
GZA Rep.	L. Prohaske	Contractor	Cryan Landscape Contractors, Inc.			Date	9/23/2019
		Operator	Jim Jones			Ground Elev.	113
Weather	Partly Cloudy, 70-80s	Make	CAT	Model	311F	Time Started	1418
		Capacity	1 CY	Reach	15 FT	Time Completed	1440

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, SILT, some fine to medium Sand, trace Roots, trace Leaves. (TOPSOIL)			E	0	1
1'	1.5' Gray, fine to coarse SAND, some Silt, trace Gravel, trace Roots (SUBSOIL)			D	4A	
2'	2.8' Brown, fine to medium SAND, some Silt, little Gravel, trace Roots. (Silty SAND)			D	1B,4A	2
3'	4.2' Brown, fine to coarse SAND, some Gravel, some Silt, little Cobbles. (TILL)			D	5A	3
4'	Bottom of Test Pit at 4.2 feet below ground surface.					
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 2.1 feet below ground surface (bgs).
3. Test pit terminated at approximately 4.2 feet bgs. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(X) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-101
Page No. 1 of 1
File No. 01.0174360.20
Checked By: HA

GZA Rep. K. Schiavone
Weather 30-40 F, Overcast

Contractor Cryan Landscape Contractors, Inc.
Operator Jim Jones
Make Cat Model 311
Capacity 0.8 yards Reach 18 FT

Date 4/16/2020
Ground Elev. 134
Time Started 0815
Time Completed 0902

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, fine SAND, little Silt, little Organic.s (TOPSOIL)			E	0	1,2
1'	Light brown, fine SAND, some Silt, little Gravel, trace Root Fibers. (SUBSOIL)			E	2A	
2'	2.5'			M	2A	
3'	Light brown, GRAVEL, some F/C SAND, some Cobbles, trace Silt. (TILL)			D	3A	3
4'				D	3A	
5'	5.5'			D	0	4, 5
6'	Refusal at 3.9 to 5.5 feet below ground surface.					
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum. When in a sloped area, the ground surface elevation was taken near the center of the test pit.
2. Roots observed from the ground surface to approximately 2.5 feet below ground surface (bgs).
3. Soil sample taken at 2.5 to 5 feet bgs.
4. Depth to bedrock varies along the trench, sloping down from 3.9 feet in the southeast to 5.5 feet in the northwest portions of the trench.
5. Test pit terminated at maximum depth of approximately 5.5' bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
20.5 × 3.5
NORTH
Volume = 14.0 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(x) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-102
Page No. 1 of 1
File No. 01.0174360.20
Checked By: HA

GZA Rep. K. Schiavone
Weather 30-40 F, Partly Cloudy

Contractor Cryan Landscape Constractors, Inc.
Operator Jim Jones
Make Cat Model 311
Capacity 0.8 yards Reach 18 FT

Date 4/16/2020
Ground Elev. 125
Time Started 0910
Time Completed 1006

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, fine SAND, little Silt, little Organics. (TOPSOIL)			E	0	1,2
1'	Light brown, fine SAND, some Silt, trace Gravel, trace Organics. (SUBSOIL)			M	0	
2'	2.0'			M	2A	
3'				D	3A	
4'				D	3A	
5'	Grey, M/C SAND, little Gravel, little Silt, little Cobbles. (TILL)			D	3A	
6'				D	3A	
7'				D	3A	
8'	8.5'			D		3
9'	Refusal at 8.5 feet below ground surface.					
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum. When in a sloped area, the ground surface elevation was taken near the center of the test pit.
2. Roots observed from the ground surface to approximately 3.2 feet below ground surface (bgs).
3. Test pit terminated at approximately 8.5 feet bgs due to excavator refusal on apparent sound bedrock or large boulder. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
17' × 4'
NORTH
Volume = 21.0 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(x) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

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Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-103
Page No.	1 of 1
File No.	01.0174360.20
Checked By:	HA

GZA Rep.	K. Schiavone	Contractor	Cryan Landscape Constractors, Inc.			Date	4/16/2020
		Operator	Jim Jones			Ground Elev.	124
Weather	30-40 F, Partly Cloudy	Make	Cat	Model	311	Time Started	1010
		Capacity	0.8 yards	Reach	18 FT	Time Completed	1100

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, fine SAND, little Silt, little Organics. (TOPSOIL)			E	0	1,2
1'	Light brown, fine SAND, some Silt, trace Gravel, trace Root Fibers. (SUBSOIL)			M	2A	
2'						
3'	3.0'			M	4A	
4'	Light brown, F/C SAND and GRAVEL, little Silt, little Cobbles. (TILL)			D	1B/4A	
5'				D	4A	
6'				D	4A	3
7'				D	4A	
8'				D	4A	
9'				D	4A	
10'				D	4A	
11'				D	4A	
12'	11.17' Refusal at 11.2 feet below ground surface.			D	4A	4
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum. When in a sloped area, the ground surface elevation was taken near the center of the test pit.
2. Roots observed from the ground surface to approximately 3.0 feet below ground surface (bgs).
3. Soil sample taken at 5-6 feet bgs.
4. Test pit terminated at approximately 11.2 feet bgs due to excavator refusal on apparent sound bedrock or large boulder. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
16' × 4'
NORTH
Volume = 26.5 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(x) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
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Boston, MA 02109

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729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-104
Page No. 1 of 1
File No. 01.0174360.20
Checked By: HA

GZA Rep. K. Schiavone
Weather 40 F, Overcast

Contractor Cryan Landscape Constractors, Inc.
Operator Jim Jones
Make Cat Model 311
Capacity 0.8 yards Reach 18 FT

Date 4/16/2020
Ground Elev. 129
Time Started 1115
Time Completed 1200

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
	0.5' Dark brown, fine SAND, little Silt, little Organics. (TOPSOIL)			E	0	1,2
1'	Light brown, fine SAND, some Silt, trace Gravel, trace Root Fibers. (SUBSOIL)			M	0	3
2'	2.5'			M	0	
3'	Grey, M/C SAND, little Gravel, trace Silt, trace Cobbles, trace Root Fibers. (SAND)			D	0	4
4'				D	0	
5'	5.0'			D	3A	
6'	Grey, M/C SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	4A	
7'				D	4A	
8'				D	2A	
9'	9.5'			D	2A	5
10'	Refusal at 9.5 feet below ground surface.					
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum. When in a sloped area, the ground surface elevation was taken near the center of the test pit.
2. Roots observed from the ground surface to approximately 2.7 feet below ground surface (bgs).
3. Moisture observed in soil from 1-2 feet bgs.
4. Soil sample taken at 4-5 feet bgs.
5. Test pit terminated at approximately 9.5 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
18' × 3.5'
NORTH
Volume = 22.0 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(x) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-105
Page No.	1 of 1
File No.	01.0174360.20
Checked By:	HA

GZA Rep.	K. Schiavone	Contractor	Cryan Landscape Constractors, Inc.			Date	4/16/2020
		Operator	Jim Jones			Ground Elev.	120
Weather	40 F, Partly Cloudy	Make	Cat	Model	311	Time Started	1240
		Capacity	0.8 yards	Reach	18 FT	Time Completed	1335

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, fine SAND, little Silt, little Organics. (TOPSOIL)			E	0	1,2
1'	Light brown, fine SAND, some Silt, little Cobbles, trace Gravel, trace Root Fibers. (SUBSOIL)			M	3A	
2'				D	5A/1B	
3'				D	2B/5A	
4'	4.0' Grey, M/C SAND, little Gravel, little Cobbles, trace Silt. (TILL)			D	4A	
5'				D	4A	
6'				D	5A	
7'				D	4A	3
8'				D	1B	4
9'				D	4A	
10'	10.5' Bottom of Test Pit at 10.5 feet below ground surface.			D		5
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 4.2 feet below ground surface (bgs).
3. Soil sample taken at 7-8 feet bgs.
4. Moisture observed in soil from 8-10.5 feet bgs.
5. Test pit terminated at approximately 10.5 feet bgs due to excavation walls collapsing. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
9' × 7'
NORTH
Volume = 24.5 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(x) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground- 10' water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-106
Page No. 1 of 1
File No. 01.0174360.20
Checked By: HA

GZA Rep. K. Schiavone
Weather 40 F, Partly Cloudy

Contractor Cryan Landscape Contractors, Inc.
Operator Jim Jones
Make Cat Model 311
Capacity 0.8 yards Reach 18 FT

Date 4/16/2020
Ground Elev. 125
Time Started 1400
Time Completed 1455

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, fine SAND, little Silt, little Organics. (TOPSOIL)			E	0	1,2
1'	Light brown, fine SAND, some Silt, little Cobbles, little Gravel, trace Organics. (SUBSOIL)			M	1A	
2'				D	2A	
3'	3.0'			D	2A	
4'	Grey, M/C SAND, some Gravel, little Cobbles, little Silt, trace Root Fibers. (TILL)			D	2A	
5'				D	2A	3
6'				D	2A	
7'				D	2A	
8'				D	2A	
9'				D	2A	
10'				D	2A	4,5
11'				D	2A	6
12'	12.0' Refusal at 12.0 feet below ground surface.					
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum. When in a sloped area, the ground surface elevation was taken near the center of the test pit.
2. Roots observed from the ground surface to approximately 6.2 feet below ground surface (bgs).
3. Slight orange stained soil mottling observed at approximately 5 feet bgs.
4. Soil sample taken at 10-11 feet bgs.
5. Moisture observed in soil from 10-12 feet bgs.
6. Test pit terminated at approximately 12.0 feet bgs due to excavator refusal on apparent sound bedrock or large boulder. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
15' × 3.5
NORTH
Volume = 23.3 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(x) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
	See Notes 3 & 5

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-107
Page No. 1 of 1
File No. 01.0174360.20
Checked By: HA

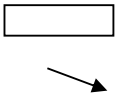
GZA Rep.	K. Schiavone	Contractor	Cryan Landscape Contractors, Inc.			Date	4/17/2020
		Operator	Jim Jones			Ground Elev.	119
Weather	30s F, Sunny	Make	Cat	Model	311	Time Started	0743
		Capacity	0.8 yards	Reach	18 FT	Time Completed	0845

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, fine SAND, little Silt, little Organics. (TOPSOIL)			E	0	1,2,3
1'	Light brown, M/C SAND, some Silt, little Cobbles, little Gravel, trace Organics. (SUBSOIL)			M	0	
2'				M	1A	
3'	3.5'			D	2A	
4'	Light brown, F/C GRAVEL and F/C SAND, little Silt, trace Cobbles. (TILL)			D	1A	
5'				D	1A	4
6'				D	1A	
7'				D	1A	
8'				D	1A	
9'				D	1A	
10'				D	1A	5,6
11'				D	1A	
12'				D	1A	
13'				D	1A	
14'	14.0' Bottom of Test Pit at 14.0 feet below ground surface.			D	1A	7
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum. When in a sloped area, the ground surface elevation was taken near the center of the test pit.
2. Test pit offset 5 feet east of the proposed location.
3. Roots observed from the ground surface to approximately 4.2 feet below ground surface (bgs).
4. Soil sample taken at 5-6 feet bgs.
5. Slight orange stained soil mottling observed at approximately 10 feet bgs.
6. Moisture observed in soil from 10-14 feet bgs.
7. Test pit terminated at approximately 14.0 feet bgs due to encountered groundwater. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan



Volume = 30.0 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(x) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground- ' water
0	14 ft.

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
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Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-108
Page No. 1 of 1
File No. 01.0174360.20
Checked By: HA

GZA Rep. K. Schiavone
Weather 30s F, Sunny

Contractor Cryan Landscape Contractors, Inc.
Operator Jim Jones
Make CAT Model 311
Capacity 0.8 yards Reach 18 FT

Date 4/17/2020
Ground Elev. 133
Time Started 0905
Time Completed 0950

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark brown, fine SAND, little Silt, little Organics. (TOPSOIL)			E	0	1,2
1'	Light brown, F/M SAND, some Silt, little Gravel, trace Organics. (SUBSOIL)			M	0	
2'	2.5'			M	1A	
3'	Light brown, F/C SAND and F/C GRAVEL, little Cobbles, little Silt, trace Root Fibers. (SAND & GRAVEL)			D	1A	
4'				D	1A	
5'				D	1A	3
6'	6.0'			D	1A	
7'	Grey, F/C SAND, some Gravel, little Cobbles, little Silt. (TILL)			D	1A	
8'	8.0'			D	1A	4, 5
9'	Refusal at 0 to 8 feet below ground surface (see note 4).					
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum. When in a sloped area, the ground surface elevation was taken near the center of the test pit.
2. Roots observed from the ground surface to approximately 3.8 feet below ground surface (bgs).
3. Soil sample taken at 5-6 feet bgs.
4. Depth to bedrock varies along the trench, sloping down from the ground surface in the northeast to 8.0 feet in the southwest portions of the trench.
5. Test pit terminated at maximum depth of approximately 8.0 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
17' × 4'
NORTH
Volume = 20.0 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(x) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No.	TP-109
Page No.	1 of 1
File No.	01.0174360.20
Checked By:	HA

GZA Rep.	K. Schiavone	Contractor	Cryan Landscape Contractors, Inc.			Date	4/17/2020
		Operator	Jim Jones			Ground Elev.	120
Weather	30s F, Sunny	Make	CAT	Model	311	Time Started	0957
		Capacity	0.8 yards	Reach	18 FT	Time Completed	1035

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5' Dark Brown, fine SAND, little Silt, little Organics. (TOPSOIL)			E	0	1,2
1'	Light Brown, fine SAND, some Silt, little Gravel, trace Root Fibers. (SUBSOIL)			M	1B/1C	
2'				M	1A	3
3'	3.5'			D	2A	
4'	Grey, M/C SAND, some Gravel, little Cobbles, little Silt, trace Root Fibers. (TILL)			D	1A	
5'				D	2A	
6'				D	2A	
7'				D	2A	
8'				D	1A	4, 5
9'	8.5' Refusal at 6 to 8.5 feet below ground surface.					
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 5 feet below ground surface (bgs).
3. Soil sample taken at 5-6 feet bgs.
4. Depth to bedrock ranged from 6 feet to 8.5 feet, sloping down to the west portion of the test pit.
5. Test pit terminated at maximum depth of approximately 8.5 feet bgs due to excavator refusal on apparent sound bedrock. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
9.5' × 7'
NORTH
Volume = 20.0 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(x) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-110
Page No. 1 of 1
File No. 01.0174360.20
Checked By: HA

GZA Rep. K. Schiavone
Weather 30s F, Sunny
Contractor Cryan Landscape Contractors, Inc.
Operator Jim Jones
Make CAT Model 311
Capacity 0.8 yards Reach 18 FT
Date 4/17/2020
Ground Elev. 114
Time Started 1050
Time Completed 1135

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0						
1'	Dark Brown, fFine SAND, some Silt, little Organics. (TOPSOIL)			E	0	1,2
1.5'						
2'				E	0	
3'				E	0	
4'	Light Brown, SILT and fine SAND, trace Gravel, trace Root Fibers. (SUBSOIL)			M	0	3
5'				M	0	
6'				M	0	
6.0'						
7'	Light Brown, M/C SAND, little Gravel, trace Cobbles, trace Silt. (TILL)			M	0	
8'				M	0	4
9'				D	1A	
10'				D	1B	
11'				D	2A	5
12'				D	2A	
12.3'						6
13'	Bottom of Test Pit at 12.3 feet below ground surface.					
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 6 feet below ground surface (bgs).
3. Soil sample taken at 3-4 feet bgs.
4. Soil sample taken at 7.5 - 8.5 feet bgs.
5. Orange mottling observed at approximately 10 feet bgs.
6. Test pit terminated at approximately 12.3 feet bgs due to wall collapsing into the excavation and groundwater. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
9.5' × 7'
NORTH
Volume = 20.0 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
See Notes 5 and 6	
0	12 feet

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GZA
GeoEnvironmental, Inc.
Engineers/Scientists
31 State Street, 8th Floor
Boston, MA 02109

Proposed Woburn Fire Dept. HQ
729-749 Main Street
Woburn, Massachusetts

Test Pit No. TP-111
Page No. 1 of 1
File No. 01.0174360.20
Checked By: HA

GZA Rep. K. Schiavone
Weather 30s F, Sunny

Contractor Cryan Landscape Constractors, Inc.
Operator Jim Jones
Make CAT Model 311
Capacity 0.8 yards Reach 18 FT

Date 4/17/2020
Ground Elev. 115
Time Started 1143
Time Completed 1220

Depth	Soil Description	Sample No.	Field Test Data	Excav. Effort	Boulders: Count/ Class	Note No.
0	0.5 Dark Brown, fine SAND, some Silt, little Organics. (TOPSOIL)			M	0	1,2
1'	Light Brown to Red, F/C GRAVEL AND F/C SAND, trace Silt, trace Cobbles. (SAND & GRAVEL)			M	0	
2'				M	0	3
3'				M	0	
4'				M	0	
5'	5.5'			M	0	
6'	Light Brown, M/C SAND, little F/C Gravel, trace Silt, trace Cobbles. (SAND & GRAVEL)			M	0	4
7'				E	0	
8'				E	1A	
9'				E	1B	
10'				E	2A	
11'				E	2A	5
12'	12.0' Bottom of Test Pit at 12.0 feet below ground surface.					
13'						
14'						
15'						
16'						

Notes:

1. Ground surface elevations estimated from a plan entitled "Existing Conditions Plan of Land in Woburn, MA", prepared by Hancock Associates, dated June 19, 2019. Elevations reference NAVD88 datum.
2. Roots observed from the ground surface to approximately 1.0 feet below ground surface (bgs).
3. Soil sample taken at 2-3 feet bgs.
4. Soil sample taken at 6-7 feet bgs.
5. Test pit terminated at approximately 12.0 feet bgs due to wall collapsing into the excavation. Upon completion test pit backfilled with excavated material in lifts and tamped with the heel of the excavator bucket.

Test Pit Plan
10' × 6'
NORTH
Volume = 26.0 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" and Larger

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
( ) Encountered
(x) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

Appendix C – Geotechnical Laboratory Testing Data

THIELSCH ENGINEERING

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
GZA GeoEnvironmental
Norwood, MA
PM: Jahan Khalili
Assigned By: Luke Prohaske
Collected By: Luke Prohaske

Project Information:
Woburn Fire Dept. HQ
Woburn, MA
GZA Project Number: 01.0174360.00
Summary Page: 1 of 1
Report Date: 09.30.19

LABORATORY TESTING DATA SHEET

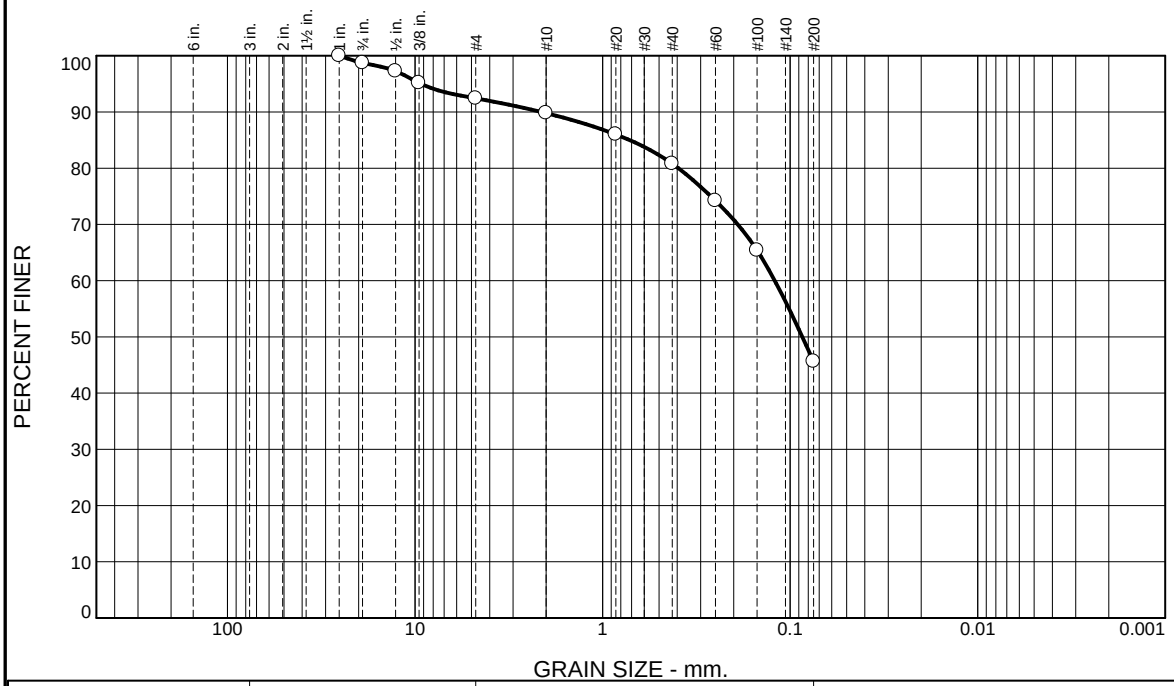
Boring ID	Sample No.	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Perme-ability cm/sec	
				D2216	D4318		D6913			D2874	D854			D1557						
TP-9	S-1	2.4-9.5	S-1				7.6	46.8	45.6											Light Brown f-m SAND and SILT, trace f-c Gravel
TP-23	S-2	4-5	S-2				42.4	36.5	21.1											Brown f-c GRAVEL and f-c SAND, some Silt

Date Received: *09.26.19*

Reviewed By:

Date Reviewed: *09.30.19*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.3	6.3	2.6	9.0	35.2	45.6	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	98.7		
0.5"	97.3		
0.375"	95.2		
#4	92.4		
#10	89.8		
#20	86.0		
#40	80.8		
#60	74.2		
#100	65.4		
#200	45.6		

* (no specification provided)

Material Description

Light Brown f-m SAND and SILT, trace f-c 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}= 2.1208 D_{85}= 0.7169 D_{60}= 0.1208
D_{50}= 0.0861 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic.
Trace amounts of twigs and roots were found within the sample.

Date Received: 9/26/19 **Date Tested:** 9/30/19

Tested By: MN / AV

Checked By: Steven Accetta

Title: Laboratory Coordinator

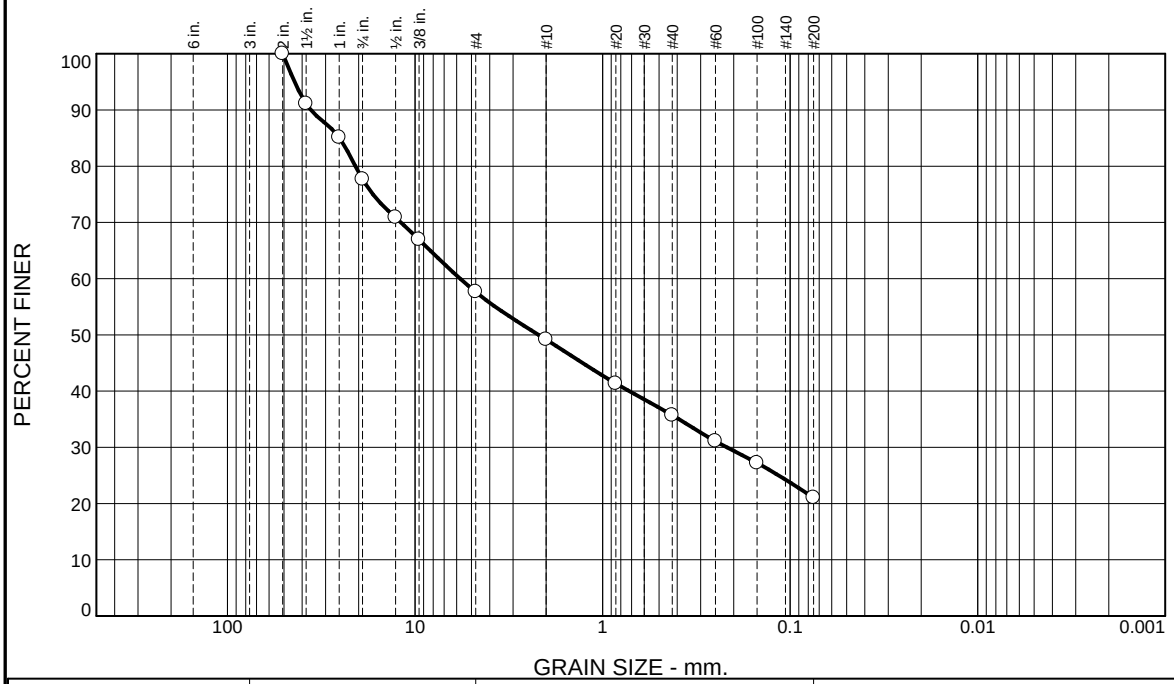
Source of Sample: Grab **Depth:** 2.4-9.5' **Date Sampled:**
Sample Number: TP-9 / S-1

Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Woburn Fire Dept. HQ
Woburn, MA
Project No: 01.0174360.00 **Figure** S-1

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.3	20.1	8.4	13.5	14.6	21.1	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
2	100.0		
1.5"	91.1		
1"	85.1		
0.75"	77.7		
0.5"	70.9		
0.375"	66.9		
#4	57.6		
#10	49.2		
#20	41.4		
#40	35.7		
#60	31.1		
#100	27.2		
#200	21.1		

* (no specification provided)

Material Description

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

Atterberg Limits (ASTM D 4318)

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

Classification

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

Coefficients

D_{90}= 35.9508 D_{85}= 25.2467 D_{60}= 5.7430
D_{50}= 2.1914 D_{30}= 0.2174 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 9/26/19 **Date Tested:** 9/30/19

Tested By: MN / AV

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: Grab **Depth:** 4-5' **Date Sampled:**
Sample Number: TP-23 / S-2

Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental

Project: Woburn Fire Dept. HQ
Woburn, MA

Project No: 01.0174360.00 **Figure** S-2

THIELSCH ENGINEERING

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
GZA GeoEnvironmental
Norwood, MA
PM: Heather Audet
Assigned By: H. Audet
Collected By: K. Schiavone

Project Information:
Woburn Fire Dept. HQ
Woburn, MA
GZA Project Number: 01.0174360.20
Summary Page: 1 of 1
Report Date: 04.28.2020

LABORATORY TESTING DATA SHEET, Report No. 7420-D-B008

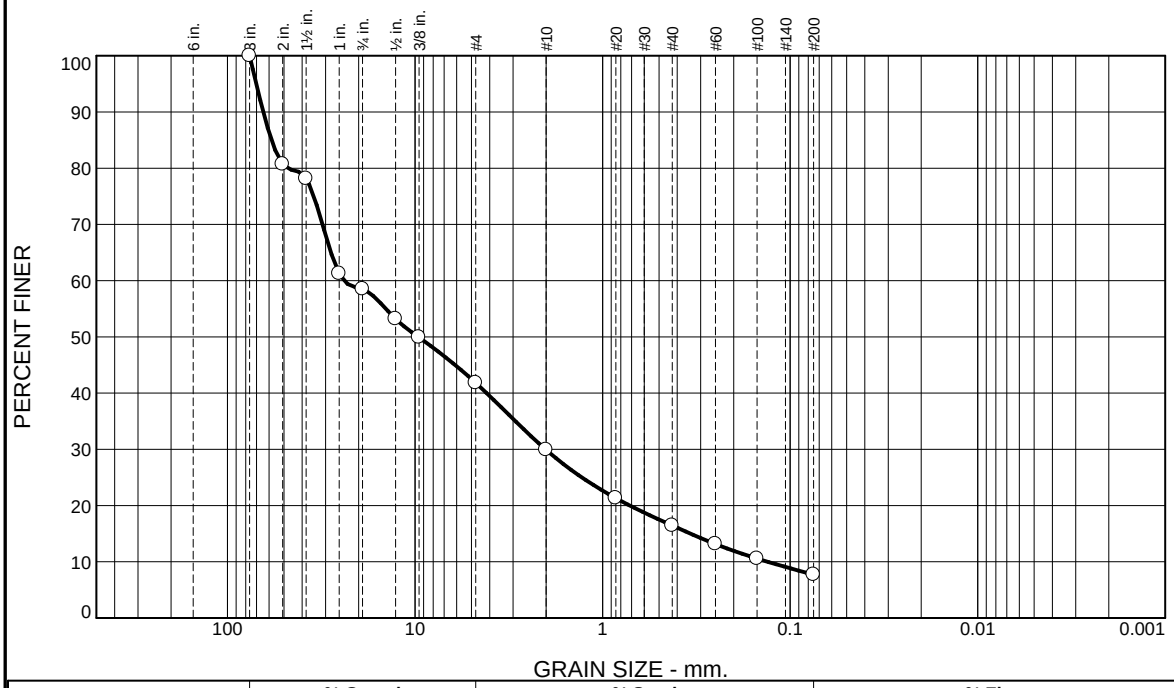
Test Pit No.	Material Source	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Perme-ability cm/sec	
				D2216	D4318		D6913			D2874	D854			D1557						
TP-101	Bag	2.5-5.5	20-S-B188				58.2	34.1	7.7											Light Brown f-c GRAVEL, some f-c SAND, trace Silt
TP-103	Bag	5-6	20-S-B189				44.4	44.9	10.7											Light Brown f-c SAND and f-c GRAVEL, little Silt
TP-107	Bag	5-6	20-S-B190				48.7	40.9	10.4											Light Brown f-c GRAVEL and f-c SAND, little Silt
TP-108	Bag	5-6	20-S-B191				44.4	45.5	10.1											Light Brown f-c SAND and f-c GRAVEL, little Silt
TP-110	Bag	3-4	20-S-B192				0.0	41.7	58.3											Light Brown SILT and fine SAND
TP-111	Bag	2-3	20-S-B193				52.2	44.4	3.4											Light Brown-Red f-c GRAVEL and f-c SAND, trace Silt

Date Received: *04.22.2020*

Reviewed By: Ronelle LaBlanc

Date Reviewed: *04.28.2020*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	41.5	16.7	11.9	13.5	8.7	7.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	80.7		
1-1/2"	78.1		
1"	61.3		
3/4"	58.5		
1/2"	53.2		
3/8"	49.9		
#4	41.8		
#10	29.9		
#20	21.3		
#40	16.4		
#60	13.2		
#100	10.6		
#200	7.7		

* (no specification provided)

Material Description

Light Brown f-c GRAVEL, some f-c Sand, trace Silt

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= GW-GM **AASHTO (M 145)=** A-1-a

Coefficients

D_{90}= 64.4764 D_{85}= 58.2589 D_{60}= 23.9683
D_{50}= 9.6053 D_{30}= 2.0153 D_{15}= 0.3394
D_{10}= 0.1317 C_u= 182.03 C_c= 1.29

Remarks

Sample contained organic content (i.e. roots, twigs).

Date Received: 04.22.2020 **Date Tested:** 04.27.2020

Tested By: GP/CC

Checked By: Ronelle LeBlanc, E.I.T.

Title: Laboratory Coordinator

Source of Sample: Bag **Depth:** 2.5-5.5' **Date Sampled:** 04.17.2020
Sample Number: TP-101

Thielsch Engineering Inc.

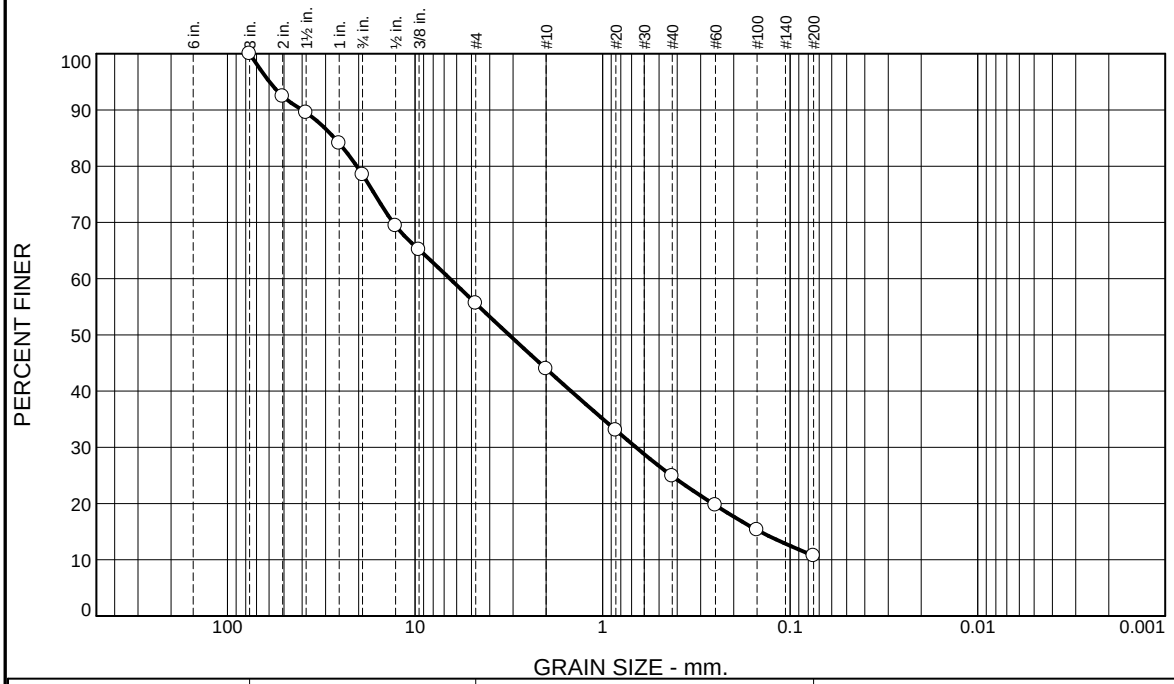
Cranston, RI

Client: GZA GeoEnvironmental

Project: Woburn Fire Department HQ
Woburn, MA

Project No: 01.0174360.20 **Figure** 20-S-B188

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	21.5	22.9	11.6	19.1	14.2	10.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	92.4		
1-1/2"	89.5		
1"	84.1		
3/4"	78.5		
1/2"	69.4		
3/8"	65.2		
#4	55.6		
#10	44.0		
#20	33.0		
#40	24.9		
#60	19.7		
#100	15.3		
#200	10.7		

* (no specification provided)

Material Description

Light Brown f-c SAND and f-c GRAVEL, little Silt

Atterberg Limits (ASTM D 4318)

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

Classification

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

Coefficients

D_{90}= 39.9779 D_{85}= 26.8417 D_{60}= 6.5150
D_{50}= 3.1510 D_{30}= 0.6635 D_{15}= 0.1443
D_{10}= C_u= C_c=

Remarks

Sample contained organic content (i.e. roots, twigs).

Date Received: 04.17.2020 **Date Tested:** 04.27.2020

Tested By: GP/CC

Checked By: Ronelle LeBlanc, E.I.T.

Title: Laboratory Coordinator

Source of Sample: Bag **Depth:** 5-6' **Date Sampled:** 04.17.2020
Sample Number: TP-103

Thielsch Engineering Inc.

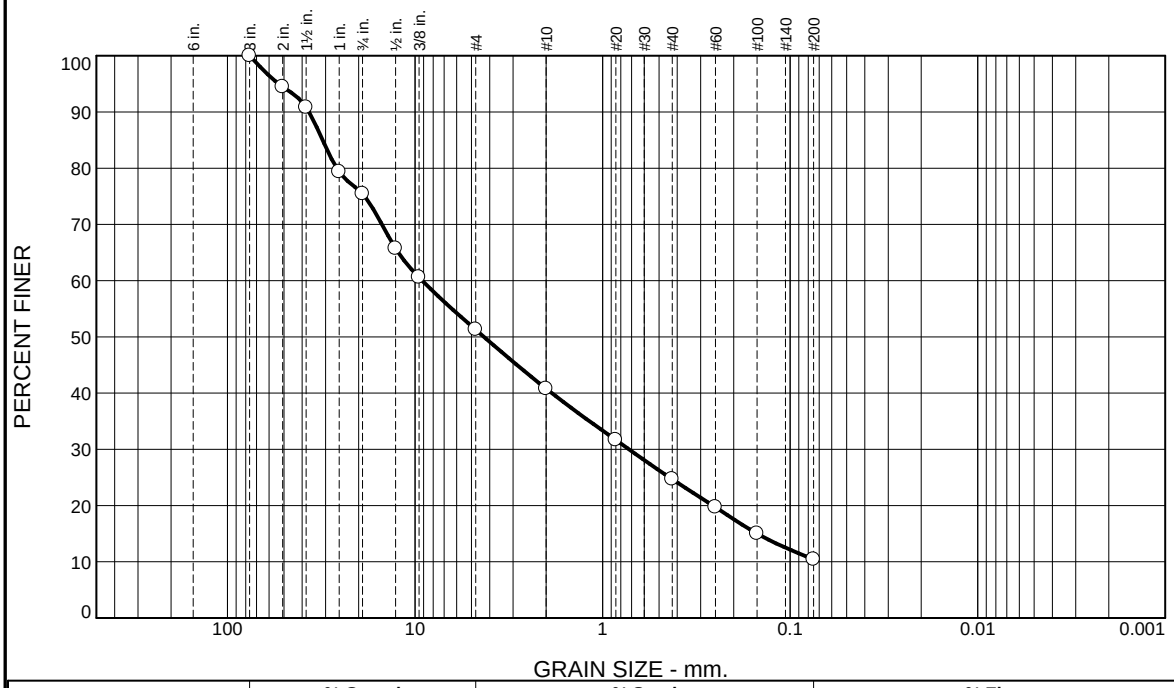
Cranston, RI

Client: GZA GeoEnvironmental

Project: Woburn Fire Department HQ
Woburn, MA

Project No: 01.0174360.20 **Figure** 20-S-B189

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	24.6	24.1	10.5	16.1	14.3	10.4	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	94.5		
1-1/2"	90.8		
1"	79.4		
3/4"	75.4		
1/2"	65.7		
3/8"	60.6		
#4	51.3		
#10	40.8		
#20	31.7		
#40	24.7		
#60	19.7		
#100	15.0		
#200	10.4		

* (no specification provided)

Material Description

Light Brown f-c GRAVEL and f-c SAND, little Silt

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= GP-GM **AASHTO (M 145)=** A-1-a

Coefficients

D_{90}= 36.7775 D_{85}= 31.0821 D_{60}= 9.1489
D_{50}= 4.2890 D_{30}= 0.7237 D_{15}= 0.1497
D_{10}= C_u= C_c=

Remarks

Sample contained organic content (i.e. roots, twigs).

Date Received: 04.17.2020 **Date Tested:** 04.27.2020

Tested By: GP/CC

Checked By: Ronelle LeBlanc, E.I.T.

Title: Laboratory Coordinator

Source of Sample: Bag **Depth:** 5-6' **Date Sampled:** 04.17.2020
Sample Number: TP-107

Thielsch Engineering Inc.

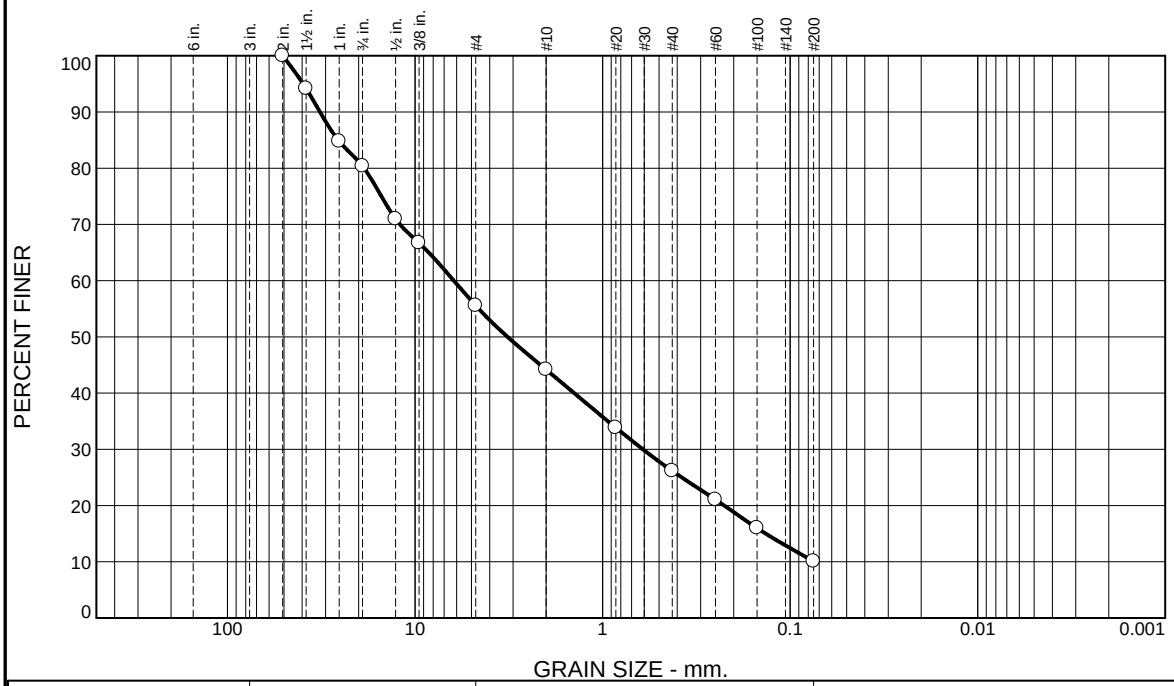
Cranston, RI

Client: GZA GeoEnvironmental

Project: Woburn Fire Department HQ
Woburn, MA

Project No: 01.0174360.20 **Figure** 20-S-B190

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	19.6	24.8	11.4	18.1	16.0	10.1	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
2"	100.0		
1-1/2"	94.2		
1"	84.8		
3/4"	80.4		
1/2"	71.0		
3/8"	66.7		
#4	55.6		
#10	44.2		
#20	33.8		
#40	26.1		
#60	21.1		
#100	16.0		
#200	10.1		

* (no specification provided)

Material Description

Light Brown f-c SAND and f-c GRAVEL, little Silt

Atterberg Limits (ASTM D 4318)

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

Classification

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

Coefficients

D_{90}= 32.1148 D_{85}= 25.7235 D_{60}= 6.2096
D_{50}= 3.2108 D_{30}= 0.6094 D_{15}= 0.1348
D_{10}= C_u= C_c=

Remarks

Sample contained organic content (i.e. roots, twigs).

Date Received: 04.17.2020 **Date Tested:** 04.27.2020

Tested By: GP/CC

Checked By: Ronelle LeBlanc, E.I.T.

Title: Laboratory Coordinator

Source of Sample: Bag **Depth:** 5-6' **Date Sampled:** 04.17.2020
Sample Number: TP-108

Thielsch Engineering Inc.

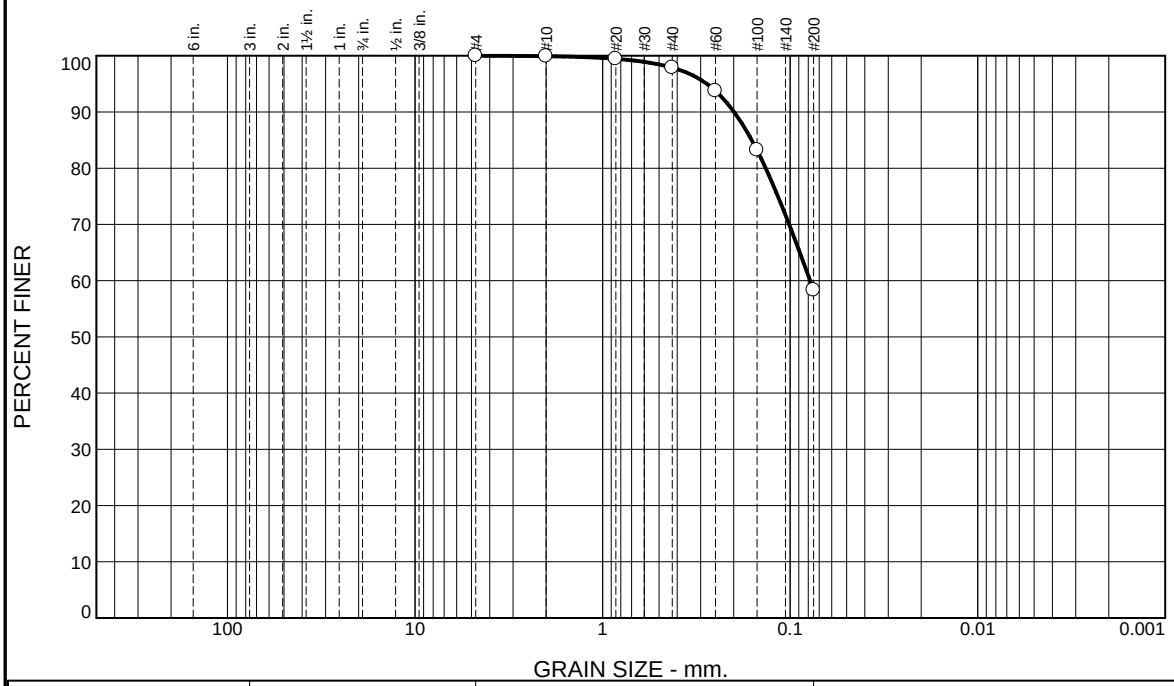
Cranston, RI

Client: GZA GeoEnvironmental

Project: Woburn Fire Department HQ
Woburn, MA

Project No: 01.0174360.20 **Figure** 20-S-B191

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.0	39.6	58.3	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#20	99.5		
#40	97.9		
#60	93.8		
#100	83.2		
#200	58.3		

* (no specification provided)

Material Description

Light Brown SILT and fine SAND

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}= 0.1989 D_{85}= 0.1601 D_{60}= 0.0783
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as non-plastic. Sample contained organic content (i.e. roots, twigs).

Date Received: 04.17.2020 **Date Tested:** 04.27.2020

Tested By: GP/CC

Checked By: Ronelle LeBlanc, E.I.T.

Title: Laboratory Coordinator

Source of Sample: Bag **Depth:** 3-4' **Date Sampled:** 04.17.2020
Sample Number: TP-110

Thielsch Engineering Inc.

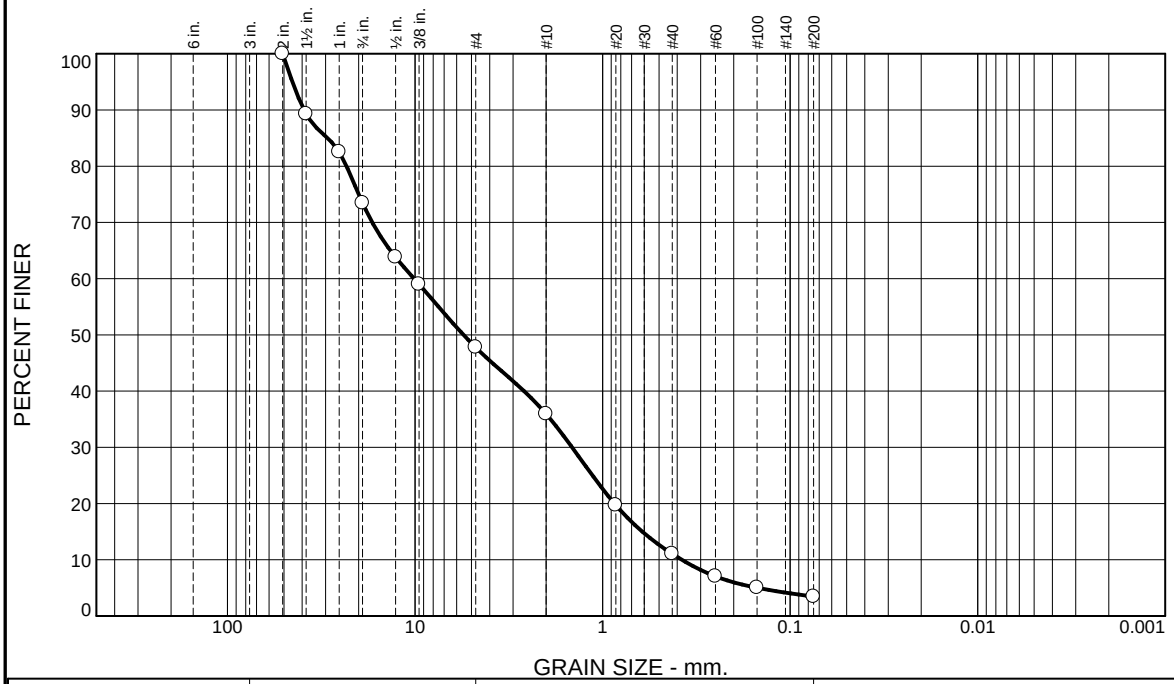
Cranston, RI

Client: GZA GeoEnvironmental

Project: Woburn Fire Department HQ
Woburn, MA

Project No: 01.0174360.20 **Figure** 20-S-B192

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	26.6	25.6	11.9	24.8	7.7	3.4	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
2"	100.0		
1-1/2"	89.3		
1"	82.5		
3/4"	73.4		
1/2"	63.8		
3/8"	59.0		
#4	47.8		
#10	35.9		
#20	19.7		
#40	11.1		
#60	7.0		
#100	5.0		
#200	3.4		

* (no specification provided)

Material Description

Light Brown-Red f-c GRAVEL and f-c SAND, trace Silt

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= GP **AASHTO (M 145)=** A-1-a

Coefficients

D_{90}= 39.0907 D_{85}= 29.2241 D_{60}= 10.1275
D_{50}= 5.5124 D_{30}= 1.4538 D_{15}= 0.6140
D_{10}= 0.3778 C_u= 26.81 C_c= 0.55

Remarks

Date Received: 04.17.2020 **Date Tested:** 04.27.2020

Tested By: GP/CC

Checked By: Ronelle LeBlanc, E.I.T.

Title: Laboratory Coordinator

Source of Sample: Bag **Depth:** 2-3' **Date Sampled:** 04.17.2020
Sample Number: TP-111

Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental

Project: Woburn Fire Department HQ
Woburn, MA

Project No: 01.0174360.20 **Figure** 20-S-B193

Division 31
Earthwork

SECTION 311000

SITE PREPARATION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 SCOPE OF WORK

A. Perform the following work, as shown on the Drawings and specified herein:

1. Site demolition and removal operations, including the removal of designated plantings, curbing, rubbish, lawn and other materials, within the limit of work line, not specifically designated to remain. Dispose of materials legally off site. Stockpile for reuse on the project those materials as shown on the drawings and specified herein.
2. Perform complete clearing and grubbing operations in areas shown on the drawings and remove all cleared and grubbed materials.
3. Inform the Architect of any materials or structures not shown on the site survey and various sitework plans and arrange or its removal from the site or protection as directed upon the Architect's request.
4. Construct construction fencing, barricades, shoring, bracing or other temporary structures to perform the work of this Section and protect existing materials to remain. Perimeter construction fencing shall remain in place for the Owner's continued use after the completion of this contract.
5. Protect all existing utilities, structures, plants and materials to remain from damage due to construction.
6. Construct and maintain siltation control fencing.

B. Items for removal and disposal include, but are necessarily limited to:

1. Trail pavement.
2. Stumps, shrubs and lawn.
3. Gate, including posts and foundations
4. All other items of removal and disposal necessary for completion of work.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following related work is to be performed under the designated SECTIONS.

1. Earthwork: SECTION 312000 - EARTHWORK
2. Erosion and sediment controls: SECTION 312500 – EROSION AND SEDIMENTATION CONTROLS
3. Rock Removal: SECTION 312319 – CONTROLED BLASTING

1.04 QUALITY ASSURANCE

A. This Contractor shall verify dimensions and elevations on the ground and report any discrepancies immediately to the Architect in writing. Any discrepancies reported prior to construction shall not be the basis for claims for extra compensation.

1.05 PROJECT CONDITIONS

A. Examination of Conditions: The Contractor shall examine the premises before submitting a bid for the work and to be fully aware of the existing conditions under which the work will be performed or that will in any way affect the work under this Contract.

PART 2 PRODUCTS

2.01 SITE CONSTRUCTION FENCING AND BARRICADES

A. The Contractor shall be responsible for providing temporary construction fencing and barricades around the Limit of Work areas and as otherwise may be necessary to assure the safety of all persons, authorized and unauthorized. Any such fencing or barricade shall be maintained in an orderly condition.

B. Unless otherwise specified, construction fence shall be 6 feet high and of chain link construction with scrims for vision and dust control, erected in a substantial manner, straight, plumb and true as approved by the Architect. Refer to drawings for locations where fence posts are to be driven and where fencing is to be movable.

C. Gates shall be built into the fence at such approved locations as are necessary, well cross braced and hung on heavy strap hinges with proper post and hook for double gates. Provide heavy hasps and padlocks for each gate. Provide keys to the Owner, and to the Police and Fire Departments to facilitate emergency access.

D. **Upon completion of the work, construction fencing shall remain the property of the City of Woburn. Refer to SECTION 015000-TEMPORARY FACILITIES AND CONTROLS.**

2.02 EROSION CONTROL

A. Refer to SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS.

PART 3 EXECUTION

3.01 PROTECTION

A. Erect and maintain temporary lights, barricades, warning signs, and guards necessary to protect streets, sidewalks and adjoining property from damage, all in accordance with applicable rules and regulations. Refer to SECTION 015000-TEMPORARY FACILITIES AND CONTROLS.

B. Protect all areas to remain undeveloped whether inside or outside the Contract limit lines. Should these areas be damaged, the Contractor shall restore them to the satisfaction of the Architect. This includes repairing and replacing all damaged elements, and materials. Materials required for repair, replacement and patching shall be provided by the appropriate Subcontractor.

C. Protection of Existing Plant Materials.

1. Within the limit of work lines protect all plant materials to remain as indicated on the Drawings. No such plant materials shall be used as guys or other fastening.
2. If, in order to perform excavation work, it becomes necessary to cut roots of plants to be saved, such roots shall be neatly cut and painted with an approved tree paint after consulting the Architect.
3. This Contractor shall be responsible for the protection of all trees within the Limit of Work Line that are to remain. Existing trees, subject to construction damage, shall be boxed, fenced or otherwise protected before any work is started. Do not permit heavy equipment or stockpiles within branch spread. Any tree damaged by operations under this Contract shall be repaired to the satisfaction of the Architect by competent tree surgeons at the expense of the Contractor, and any trees damaged beyond repair shall be replaced by an equivalent tree.

3.02 CLEARING AND GRUBBING

A. Clearing shall consist of the cutting and removal of all trees, logs, stumps, brush, roots and other objectionable material from within the Limit of Work Line unless otherwise shown on the plans or directed by the Architect.

B. Grubbing shall include the removal and disposal of all stumps and roots.

3.03 OTHER REMOVALS

A. All other existing material not designated to remain shall be removed in its entirety including both above and below grade components of each item.

B. All existing items noted above not reused in this project shall be deposited or neatly piled or stacked in a location proposed by the Contractor for approval by the Architect.

C. Any item not reused in this project and not selected by the Architect or specified as salvaged for the Owner shall become the property of the Contractor and shall be removed from the site and legally disposed of.

3.05 EROSION CONTROLS

A. Refer to SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS.

END OF SECTION

SECTION 312000

EARTHWORK

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine and be familiar with all conditions as they exist at the project site and project-related areas prior to submitting a bid for the work of this SECTION.

1.02 SCOPE OF WORK

A. Provide labor, materials, and equipment to perform the following work, as shown on the Drawings and specified herein:

1. Strip **all** topsoil/loam, forest mat and subsoil from areas designated on the Drawings and remove from the site, except as noted below:
    a. At the General Contractor's option, in lieu of furnishing and installing new loam for areas to be seeded under this contract, stockpile on site for use under this contract sufficient existing topsoil/loam. Refer to SECTION 311000 – SOIL PREPARATION
    b. Stripped subsoil shall be used to fill certain proposed landscape areas, as shown on the Drawings.
2. Perform all excavation as required for the access drive, utilities, erosion control features, future building and parking areas and other work indicated on the Drawings and for which excavation would be required.
3. Include in the Base Bid the removal of two hundred-fifty (250) cubic yards of rock/ledge anticipated to be encountered for future building, site walls and utility installation, the quantity to be adjusted upward or downward in accordance with SECTION 012200 – UNIT PRICES.
4. Perform all filling and backfilling, as required for pavement, utility corridors, site grading, temporary stormwater management, erosion control features, buildings and other structures requiring fill to establish subgrades within areas indicated on the Drawings and/or references herein.
5. Furnish and install compacted gravel base courses for the construction entrance.
6. Perform all pumping and bailing necessary to maintain excavated areas free of water from any source.

7. Remove from the site all excess excavated unsuitable materials that are not specifically designated herein to be re-used. Legally dispose of same in accordance with this Section.

8. Obtain all required permits, licenses, and approval of appropriate municipal and utility authorities, prior to commencing the work of this SECTION, and pay all costs incurred there from.

9. Protect exposed areas of the site from disturbance by weather and working conditions.

10. Proof-roll natural soil and fill subgrades in the presence of the Architect or his designated consultant and abide by their sole judgment in determination of suitability of subgrade.

11. Furnish, install, and remove temporary excavation support, where required, for the construction of utilities.

12. Dust control and clean-up.

13. Perform all dewatering necessary to maintain excavated areas free of water. Under no circumstances shall fill be placed through standing water or into an insufficiently dewatered excavation as determined by the Architect or their authorized representative (collectively referred to herein as Architect). All excavations shall be dewatered as required herein to allow evaluation of conditions at the bottom of the excavations by Architect, especially removal of unsuitable materials, and firmness of the exposed subgrade by observation and proof rolling.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following related work is to be performed under the designated SECTIONS:

1. Clearing and grubbing, including removal of existing shrubs, and site demolition: SECTION 311000 – SITE PREPARATION.

2. Installation of erosion and siltation controls: SECTION 312500 — EROSION AND SEDIMENTATION CONTROLS.

3. Rock Removal: SECTION 312319 – CONTROLLED BLASTING

4. Loaming, finish grading and seeding of areas as shown on the drawings: SECTION 329113 – SOIL PREPARATION, SECTION 312219 – FINISH GRADING, and SECTION 329200 – LAWNS AND GRASSES.

1.04 SUBSURFACE DATA

A. Subsurface explorations have been made in certain locations on the site and the results are included within the geotechnical report for the project prepared by GZA GeoEnvironmental, Inc. revised June 29, 2020. This report is provided for informational purposes and is not part of these specifications. However, the boring logs, test pit logs, and geotechnical laboratory testing (referred to as SUBSURFACE LABORATORY DATA) appended to the report are considered part of the project specifications.

B. The Contractor shall review and become familiar with SUBSURFACE DATA prior to bidding to enhance their understanding of site conditions. The Contractor shall also be aware that subsurface conditions between the exploration locations and over time might be different since material layers and elevations can change, and groundwater elevations may differ. The strata and groundwater data shown on the logs include interpretations of approximate elevations and boundaries between subsurface materials. The actual transition may be gradual or may different from those indicated. After obtaining Owner's permission, take whatever additional subsurface explorations deemed necessary at no expense to the Owner.

C. SUBSURFACE DATA are for general information and are accurate only at the particular locations and times the subsurface explorations were made and laboratory test samples were obtained. It is the Contractor's responsibility to make interpretations and draw conclusions based on the character of materials to be encountered and the impact on his work based on his expert knowledge of the area and of earthwork techniques.

1.05 BENCHMARKS, LINES AND GRADES

A. The General Contractor shall employ, within the Contract Price, a competent, independent Land Surveyor, registered in Massachusetts, who shall perform the following work.

1. Verify all locations, lines, grades, work lines, and other dimensioned points indicated on the Contract Drawings for the Work.

2. Submit, to the Architect, a written confirmation of locations of all lines, and any discrepancies between conditions and locations as they actually exist and those indicated on the Contract Drawings. Such confirmation shall bear the Surveyor's registration stamp.

3. A topographic survey of the interim condition showing the finished excavation work prior to the installation of fill for all areas of the site work will be performed by an independent surveyor paid for by the Owner to document the bottom of excavation elevations as excavation work proceeds, and will include elevations with spot grades and one foot contour interval. Plans shall be provided in AutoCAD and PDF digital format at the same scale as the Contract Drawings. Based on the excavation elevations and the original existing conditions survey plans, compute the volume of materials excavated.

4. Promptly submit to the Architect any measured discrepancy between Contract and actual volumes, positive or negative, for resolution of payment based on sole judgment of Architect.

5. Upon completion of the grading work the General Contractor shall perform an as-built topographic survey and provide a record drawing of constructed conditions. The record drawing shall be provided to the Architect within 72 hours after the established date of Substantial Completion. The cost of the As-Built survey and drawing shall be included in the Base Bid cost.

   The plan will include the completed site grades with spot grades and one foot contour interval connecting ten feet into the undisturbed adjacent grades. Plans shall be provided in AutoCAD and PDF digital format at the same scale as the Contract Drawings.

   Note that in order for the “As-Built Plan” to be properly prepared, the surveyor must be on site sufficiently during the construction and installation to locate structures before backfill to permit the Surveyor to certify to the locations of underground utilities shown on the As-Built Plan. Notes on the plan such as “approximate location”, or “pipe / structure buried, could not be located” are not acceptable to meet this standard.

6. Prepare calculations of the volumes of fill materials and rock excavation based on the excavation survey and the finished as-built survey.

B. The General Contractor shall not commence any excavation or site work until the Surveyor's verification has been received by the Architect, and the Architect has reviewed the verification and authorized such commencement.

1.06 FINISH GRADES

A. The words "finish grades" as used herein, mean the required final grade elevations indicated on the Drawings. Where not otherwise directed, areas shall be given uniform slopes to the existing grades, except that vertical curves or roundings shall be provided at abrupt changes in the slope.

1.07 DISPOSITION OF UTILITIES

A. Conform to the requirements of the municipality and other authorities having jurisdiction over the existing utilities and notify the appropriate municipal officials in advance of performing any work prior to commencing same. Protect active utilities from damage and remove or relocate only as indicated or specified. If, in the progress of excavation, any utility should become damaged and result in any damage to public or private property, the General Contractor shall restore to the original condition, at no additional cost to the Owner, anything which has been damaged or disturbed.

B. Should any utility that is not indicated on the Drawings be encountered in the excavation work, notify the Architect and the Owner in writing and request disposition for same, before proceeding to perform any work on same.

C. Remove, plug, and cap inactive utilities and utilities which have been disconnected.

D. Coordinate all work on existing utilities with Subcontractors, as applicable, and the authority having jurisdiction over same.

1.08 PERMITS AND CODES

A. Procure all permits and licenses required for the work of this SECTION, prior to commencing the work. Refer to SECTION 011000 - SUMMARY OF WORK.

B. Comply with all applicable codes, ordinances, rules, regulations and laws of all local, municipal, state and federal authorities having jurisdiction over the work.

C. Federal NPDES Phase II Compliance: The Contractor is responsible for compliance with the U.S. EPA - National Pollution Discharge Elimination System, Permit for Construction Activities Requirements. This includes, but is not limited to, the preparation of a Stormwater Pollution Prevention Plan (SWPPP) and the filing of a Notice of Intent with the U.S. EPA. The SWPPP shall be consistent with the erosion control information contained on the plans and with other state and local laws regulation and permit requirements for the project.

D. In case of conflict between regulations or between regulations and Specifications, the Contractor shall comply with the strictest applicable codes, regulations, or Specifications.

1.09 DUST CONTROL

A. Employ all methods required to effectively control dust created by the work of this SECTION.

B. Particular attention is called to the need to control and prevent site dust from entering the adjacent residential properties, and to the need to prevent tracking of mud and soil on public roads, by whatever means and methods required.

1.10 EXAMINATION OF SITE AND DOCUMENTS

A. By submitting a bid, the Contractor warrants that he has carefully examined the project site and all conditions and related areas affecting work under this SECTION, and is sufficiently familiar with such to submit an accurate bid. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

B. Plans, survey, measurements, and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them during the bidding period, as no additional compensation will be made for errors or inaccuracies that may be found therein.

1.11 DRAINAGE AND DEWATERING

A. Upon entering the premises, the Contractor shall assume responsibility for project site and project-related areas and subsurface drainage and shall maintain such drainage during the life of this Contract in a manner acceptable to the Architect, at all times protecting and maintaining the existing conditions in adjacent areas.

B. Contractor shall obtain proper permits and legally remove by pumping, draining or bailing, all water which may accumulate or be found on the site within the contract limits, where excavation and grading are to be performed. Excavate and form all pump wells, sumps, dams, flumes or other necessary works to keep excavations entirely clear of water at no additional cost. Newly constructed and existing concrete and masonry shall be protected from damage resulting from dewatering work by the use of canvas, tar paper or by such other sufficient method as the Architect may approve.

C. The Contractor shall adapt and modify the dewatering and treatment systems as required throughout the course of the Work to meet the requirements of the project. The design and operation of the treatment system shall be the sole responsibility of the Contractor.

D. Maintain site and subsurface drainage in an acceptable manner during the course of the Work and maintain compliance with Stormwater Pollution Prevention Plan (SWPPP) and SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS.

E. Provide, maintain, and operate pumps and related equipment, including standby equipment, of sufficient capacity to adequately dewater excavations until the required construction, installation and backfilling are completed to a level above the water level. When constructing structures that may be subject to buoyant forces, maintain dewatering operations until sufficient structure dead weight or backfill is in place to resist uplift forces.

F. Maintain water levels at least 1 foot below subgrades or at a level which maintains a dry, stable subgrade, whichever is deeper, and at all times, continuously, 24 hours per day until such time as the fill is above the pre-construction static seasonal groundwater level. Dewatering operations shall prevent loss of fine materials or other disturbance to the subgrade. Disturbed subgrades shall be excavated and replaced with suitable material at no additional cost to the Owner.

G. All sumps shall be surrounded by suitable filter fabric, crushed stone or other acceptable materials to prevent the migration or pumping of fine materials and subgrade disturbance.

H. Maintain site grades to direct surface runoff to collection points. Prevent surface water from running or collecting over prepared subgrades or fill surfaces. Do not permit standing water to accumulate in excavations.

I. Water from excavations shall be disposed of in such a manner as will not cause injury to public health nor to public or private property, nor to existing work, nor to the work completed or in progress, nor to the surface of roads, walks, and streets, nor cause any interference with the use of the same by the public. Under no circumstances shall Contractor place concrete, place fill, or install appurtenance in excavations containing free water.

1.12 SAMPLES AND TESTING

A. All fill materials and their placement shall be subject to quality control testing. Testing of fill compaction and materials will be performed by a qualified representative provided by the Owner and paid for by the Owner outside of the Contract Price. The Architect or their authorized consultant will observe placement and compaction of fill, removal of unsuitable soils, and foundation subgrade preparation, and will test soils for gradation, moisture-density relationships (Proctor), field moisture content, and field compaction at frequencies and locations that he/she shall select. All work shall conform to the placing, compaction, and moisture control requirements determined by these tests and as specified herein. The results of these tests will be submitted to the Contractor on a timely basis so that the Contractor can take such action as is required to remedy any indicated deficiencies. During the course of construction activities, the Architect will advise the Owner and Contractor in writing, if at any time the work does not, in the opinion of the Architect, conform to the contract documents.

B. Provide samples of each fill material from the proposed sources of supply at least two (2) weeks before intended use. Submit samples from alternate sources if required. Architect will be sole and final judge of suitability of all material. Fill material samples shall be a minimum of fifty (50) pounds. With each sample provide the following written documentation:

1. Location and name of material source. Indicate whether the material is natural soil or a processed material.
2. Proposed on-site use and applicable specification section.
3. Results of chemical testing specified in Article 2.01.A of this specification.

Samples that do not contain sufficient identifying information will be rejected.

C. Do not use materials in question pending test results. If the Contractor elects to use the material and it subsequently fails to meet project specifications, the non-conforming materials shall be removed and replaced at no additional cost to the Owner.

D. Maximum density and optimum water content will be determined for each submitted type of fill (other than Crushed Stone) that meets gradation requirements in accordance with ASTM-D 1557.

E. Cooperate with the Architect in obtaining field samples of in-place materials after compaction and in the field compaction testing. Furnish incidental field labor in connection with such tests. Provide free and clear access to the work at all times.

F. Representatives' of the Owner (geotechnical engineer, civil engineer, OPM, architect, testing agency, etc.) presence does not include supervision or direction of the actual work by the Contractor, his employees, or agents. The presence of the Owner's representatives or any observations and testing performed by their representatives, or any notice or failure to give notice, shall not excuse the Contractor from defects discovered in the Work nor shall warranties be affected.

G. Submit representative samples of any filter fabric, reinforced stabilization fabric, or other materials proposed for use, with manufacturer's specifications and product literature at least two (2) weeks in advance of use of these materials.

H. As construction proceeds, notify the Architect prior to the start of earthwork operations that require observations and testing. A minimum of 72 hours notification shall be provided for work for the purpose of establishing the Contractor's schedule of operations and scheduling observation and testing procedures and requirements.

I. As construction proceeds, the Contractor shall be responsible for notifying the Architect prior to the start of earthwork operations requiring observation and/or testing.

1.14 DEFINITIONS

A. Unclassified Materials: Unclassified excavation includes the satisfactory removal and disposal of all materials (except Bedrock as defined in Section 312319 Controlled Blasting) encountered regardless of the nature of the materials and shall be understood to include, but not be limited to, natural soils, fill, rock, abandoned drainage and utility structures, and debris.

B. Obstruction: An obstruction is defined for payment purposes as stone over two cubic yards (2 cy) in volume in open areas and one cubic yard (1 cy) in volume in trenches, and masonry or concrete that cannot be broken or removed by normal job equipment (power shovels, scoops, or D-8 bulldozers with ripper attachment) without the use of explosives, drills or hoe-ramming equipment. The classification does not include materials that can be removed by means other than drilling and blasting, drilling and wedging or hoe-ramming. The word "trench" shall mean excavations having near-vertical sides; the depths of which exceed the width, made for drain, sewer, water, and gas pipes; electric and steam conduits; and the like. Trenches in excess of ten feet (10') in width and pits in excess of twenty feet (20') in either length or width are classified as open excavation.

1.15 ALTERNATE NO. 1

A. Base Bid – Under the Base Bid the Contractor shall be responsible for the removal and off-site disposal of all surplus topsoil and subsoil excavated from the site, said material being the property of the Contractor.

B. Alternate No. 1 – Under Alternate No. 1, the City shall maintain ownership of the surplus topsoil and subsoil. The Contractor shall include in the price of Alternate No. 1 the following:

1. Loading, hauling and stockpiling the surplus topsoil and subsoil to a single site within the City of Woburn, location to be determined.
2. Installing soil stockpile protections at the stockpiled topsoil and subsoil as shown on drawing ESP-3. There shall be one stockpile for loam and one stockpile for subsoil.

C. Refer to SECTION 012300-ALTERNATES.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. The Contractor shall provide chemical testing results to show that the imported soil does not contain contamination and does not contain metals or polyaromatic hydrocarbons (PAHs) at concentrations above background levels for natural soils, as published by the Massachusetts Department of Environmental Protection, nor does it contain asbestos fibers. As a minimum, environmental testing shall include total petroleum hydrocarbons (TPH) by ASTM D3328/EPA Method 8100, semi-volatile organic compounds (semi-VOC) by EPA Method 8270, and metals (RCRA 8) by EPA Methods 6010/7471A at one sample per 500 cubic yards of soil to be imported, unless otherwise waived by Owner. Asbestos testing shall be conducted at one sample per 100 cubic yards of soil to be imported, unless otherwise waived by Owner.

B. Granular Fill (aka Free Draining Granular Borrow) : Fill to raise the grade in areas as shown on the Drawings, or where otherwise shown on the Drawings. The material shall consist of inert natural material (Bank Run) 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:

Sieve Size	Total Percent Passing by Weight
2 inches	100%
No. 10	30-95%
No. 40	10-70%
No. 200	0-8%

Sieve Testing shall be in accordance with AASHTO T27 and T11 and the material shall meet the above gradation and shall meet the Unified Soil Classification System definition of Well Graded with a Coefficient of Uniformity (Cu) of greater than 4 and a Coefficient of Curvature (Cc) of 1 to 3.

PART 3 EXECUTION

3.01 STRIPPING TOPSOIL

A. Topsoil, forest mat and subsoil shall be stripped for their entire depth within the designated areas. Topsoil, forest mat and subsoil shall be stripped before any underlying excavating or filling is begun.

B. Stripped topsoil, forest mat and subsoil shall be removed from the site except as noted herein.

3.02 TEMPORARY EARTH SUPPORT

A. Provide temporary earth support (shoring, sheeting and/or bracing, etc.) at excavations as required to prevent cave-ins of excavation and to assure complete safety of existing trees, utilities and pavements that are to remain in place. Design of support plan shall be performed and stamped by a professional engineer registered in the Commonwealth of Massachusetts engaged by the Contractor.

B. Comply with the more stringent of local safety regulations, the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc. or applicable sections of 29 CFR Part 1926 (OSHA).

C. Remove sheeting, shoring and bracing taking all necessary precautions to prevent collapse of excavation sides and protect adjacent structures. Immediately refill all voids left after withdrawal of shoring with same material as backfill and ram with tools especially adapted to that purpose or otherwise compacted as directed to achieve the required density. Where sheeting is required to be left in place, obtain written authorization from the Architect, and the Contract Amount will be adjusted accordingly. Temporary excavation support, whether to be removed or left in place, shall be designed and located so that it will not cause damage to the structures.

D. Leave no temporary earth support in place without the written approval of the Contractor's Engineer and consent of the Architect, and prominently indicate all such installations on the design Drawings.

3.03 EXCAVATION

A. Include the excavation of earth and all other materials to the depths, form and sizes as shown on the Drawings, and as necessary for the completion of the construction.

B. If any part of the excavation is carried through error beyond the depth and dimensions indicated on the Drawings or specified herein, the Contractor shall at his own expense, dewater as required and furnish, place and compact fill materials all as specified hereunder to restore excavations to depths and dimensions shown on the Drawings or specified herein.

C. The word "trench" shall mean excavation having vertical sides whose depths exceed their width, such as drain, sewer, water and gas pipes, electric and steam conduits.

D. Soil subgrade should be prepared smooth. Smooth subgrade may be achieved by completing final excavation using a smooth-edged excavator bucket, finishing with hand tools, and rolling with a smooth-drum roller.

E. Protect bottoms of excavations from frost and from disturbance due to construction activities, traffic, wetting and/or drying. Subgrades that become disturbed shall be re-compacted or removed to undisturbed soil and replaced with crushed stone or applicable fill for the location to be placed, in sole judgment of Architect.

F. As excavation approaches existing underground utilities and structures, excavate using hand tools. Such manual excavation is incidental to normal excavation and no special payment will be made.

G. Excavation for Loamed and Seeded Areas - Excavate to subgrade elevations, in areas designated on the Drawings to receive loaming and seeding.

H. Payment Lines for Earth Excavation - Include in the general bid price the excavation of existing topsoil, subsoils, organic materials and debris to the grades shown on the Drawings (Refer to Drawing ESP-4). Payment for actual excavation performed shall be determined as follows:

1. After stripping all topsoil from the site, the Contractor shall remove the top and subsoil earth materials and ledge/bedrock only to the depth of the existing natural granular soils which may be shallower or deeper than indicated by the grades shown on the Drawings. Prior to placing any fill, the Contractor shall coordinate with the OPM to have the bottom of excavation surveyed by an independent registered land surveyor retained by and paid by the Owner for comparison with and the actual volume removed compared to that shown by the contract drawing contours. The contract amount shall be adjusted upward or downward based on the actual quantities removed in accordance with SECTION 012200-UNIT PRICES.

2. The Contractor shall remove the ledge/bedrock, in the areas indicated on the drawings and where ledge/bedrock is above the elevations shown on the drawings. The Contractor shall have the actual volume of ledge removed compared to that shown on the contract drawing ESP-4. Two hundred fifty (250) cubic yards of rock shall be carried in the Base Bid by the Contractor, and the contract amount shall be adjusted upward or downward based on the in-place actual quantities removed in accordance with SECTION 012200-UNIT PRICES.

3. Unless otherwise indicated or specified, in order to qualify for extra work and additional payment for same, earth excavation must be carried beyond the specified limits, and then only by written direction of the Architect. Material removed for Contractor's convenience or without the authorization of the Architect will not be paid for and will not become the basis for a claim.

3.04 EXCAVATION OF UNSUITABLE MATERIAL

A. General: Excavate all unsuitable material to firm natural ground in the manner specified below and in the Contract Drawings. Unsuitable material includes topsoil, subsoil, frozen soils, and soil containing debris and, within the proposed building area, existing fill, blast rock, organic soils (including peat), in sole judgment of Architect. Notify Architect when unsuitable soils are still encountered at the contours shown on the Drawings and remove unsuitable soils only after authorization by Architect.

B. Follow a construction procedure which permits visual identification of firm natural ground. Maintain groundwater levels below excavation bottom as specified herein.

3.05 UNANTICIPATED SUB-SURFACE CONDITIONS

A. If unsuitable materials are encountered at depths below the excavation grades shown on the Drawings, notify the Architect of the unanticipated subsurface conditions prior to removal of these materials. Remove and replace unsuitable materials only when authorized by Architect.

B. Additional Excavation

1. Excavation below the anticipated depths for the work indicated, if ordered to be removed by the Architect with the prior written approval of the Owner will be paid for, in accordance with SECTION 012200 - UNIT PRICES.

2. The Contractor shall employ an independent registered surveyor for all survey and volume calculation for the purpose of determining payment, which may be subject to independent verification by the Architect at the Architect's option.

C. Additional Borrow

1. The Contractor shall provide, place, and compact additional specified fill materials for any unanticipated filling or backfilling requirements if ordered in writing by the Architect.

2. Payment for additional in-place fill materials will be made in accordance with SECTION 012200 - UNIT PRICES.

3.06 ROCK REMOVAL

A. Excavated material will be classified as specified under SECTION 312319 – CONTROLLED BLASTING.

B. When rock is encountered during excavation, such material shall be uncovered and exposed, and the Architect shall be notified by the Contractor, before proceeding further. The areas in question shall then be cross-sectioned as stipulated in paragraph D. following. The Contractor shall not proceed with excavation of material claimed as rock until the material has been classified by the Architect. Should the Contractor proceed with the excavation without notifying the Architect or prior to the survey, he shall forfeit his right to extra payment in the subject area.

C. Adjustments in base bid rock excavation quantities specified under Paragraph 1.02 A.3 shall be in accordance with SECTION 012200-UNIT PRICES and paragraph D. following.

D. The Owner shall employ an independent registered surveyor to survey and take cross-sections of rock before removal of same, and to provide computations of cross-sections and volumes within the pay-line limits. The contract price shall be adjusted upward or downward based on actual in-place quantities of rock removal.

E. Refer to SECTION 312319-CONTROLLED BLASTING.

3.07 FILLING OR BACKFILLING

A. Materials shall be placed in horizontal, maximum 12-inch thick loose layers. Successive layers shall be placed at right angles to previous layers and compacted as specified. Place successive layers until the surface is at specified sub-grade elevations.

B. Prior to fill placement, proof roll the exposed subgrade with a minimum of four (4) passes of a vibratory drum roller having a drum weight of not less than eight thousand pounds (8,000 lbs.) or by loaded dump truck unless otherwise approved by the Architect. No work shall be done unless observed by the Architect. If soft or unstable areas are observed, the Architect may direct the Contractor to remove the soft material to a firm subgrade and replace with Sand-Gravel Fill or Granular Fill. Compact materials to the required densities specified herein. Additional work authorized by the Architect will be paid for in accordance with the submitted unit prices on the Form for General Bids or SECTION 012200 - UNIT PRICES, as applicable.

C. Under no circumstances shall any fill be placed into or below standing water or groundwater. The Contractor is responsible for maintaining water levels at least 1 foot below the bottom of excavations.

D. Fill that is too wet for proper compaction shall be scarified, diced, harrowed, or otherwise dried to a proper moisture content for compaction to the required density. If the fill material cannot be dried within forty-eight (48) hours of placement, it shall be removed and replaced with drier fill at the Contractor's expense.

E. Fill that is too dry for proper compaction shall receive moistening by controlled addition of water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.

F. Fill that becomes disturbed after compaction as a result of the Contractor's operations shall be removed and replaced or re-compacted to the specified degree of compaction at the Contractor's expense.

G. Materials that are within the moisture requirements specified above, but display pronounced elasticity, weaving or deformation under the action of earthmoving and compaction equipment, shall be reduced to Optimum Moisture Content, or below, and re-compacted until stable. If these materials cannot be stabilized, they should be removed and replaced at Contractor’s expense.

H. Where the horizontal layer meets a natural rising slope, the layer shall be keyed into the slope by cutting a bench.

I. Subgrades for fills shall be prepared in an approved manner by stabilizing or removing unsuitable materials. Any subgrades which have been disturbed due to weather, construction traffic, etc., and which, in the opinion of the Architect, are unsuitable, shall be excavated to a firm subgrade and then compacted with at least four passes of a suitable vibratory compactor under the observation of the Architect before any fill is placed.

J. In no case, shall any fill be placed over frozen material, and frozen material shall not be used as fill. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until moisture content and the density of the previously placed fill are as specified.

K. Site soils for reuse shall only be placed in landscaped areas where indicated on the Drawings.

L. The Contractor shall be aware that existing site soils with fines content higher than 15 percent will be difficult to place and compact, especially when wet. Maintain careful field control to prevent existing Site soils to be reused from becoming wet in a loose condition and, once placed, from becoming disturbed in the presence of water. Contractor shall be solely responsible for reuse of existing site soils, but may consider the following measures to assist in managing reuse of existing Site soils:

1. Stockpiled soils should be completely covered with waterproof tarpaulins and maintained to prevent wetting from precipitation making them too wet for proper workability and compaction.
2. Each layer of fill should be compacted to the specified density the same day it is placed. This will reduce the risk of a loose layer of this material becoming wet and unmanageable from wet weather.
3. Following compaction, the surface of the fill should be sloped slightly and smoothed with a smooth-drum-roller to promote runoff.

3.08 COMPACTION

A. Compaction Requirements

1. The degree of compaction is expressed as a percentage of the maximum dry density at optimum moisture content as determined by ASTM Test D1557, Method C. The compaction requirements are as follows:

Area	Minimum Degree of Compaction
Within proposed building and pavement areas	95%
Within proposed landscape areas	90%

2. Compaction percentages are based on the laboratory derived Maximum Density Values as determined by ASTM Method 1557 C.

B. Grading Tolerances

1. Grading shall be completed to meet or exceed the following tolerances of uniformity*:

Location	Tolerance
Top of Subgrade	1 inch

*Uniformity is defined as no variations in the surface materials, at the grades and slopes indicated on the drawings that exceed the listed tolerance over a length of ten (10) feet horizontally in any direction.

2. The bottom of excavations shall be formed to provide a smooth, uniform slope and grade. The bottom of the excavated grade shall be free of pockets, depressions or ridges that would collect or concentrate water, silts or other such objectionable material.

D. Finish

1. Upon completion of the work, ground surface shall be left in a firm, unyielding, true, uniform condition, free of ruts.

3.09 SUBGRADE MAINTENANCE

A. The work of this SECTION shall provide a final subgrade which shall be parallel to the finished grades or elevations shown on the Drawings and shall be below finished grades in accordance with the various depths shown on the Drawings and specified hereunder.

B. Upon completion of rough grading operations, remove all debris and rubbish; leave areas ready for work of other trades. Subgrades specified above shall be maintained until work by other trades begins. Correct and restore settlement of fills and washouts by filling and compacting as required.

C. Should any area of the subgrade or subsequent fill become disturbed because of operations on the part of the Contractor which do not conform to these specifications, the disturbed soil shall be removed completely and replaced with compacted Structural Fill. The necessity and extent of such removal shall be decided by the Architect and shall be entirely at the Contractor's expense.

3.10 FROST PROTECTION

A. Do not excavate to full indicated depth when freezing temperatures may be expected. Protect the excavation from frost. Should protection fail, remove frozen materials and replace with Structural Fill, as directed at no cost to the Owner.

B. The Contractor, at no expense to the Owner, shall keep the operations under this Contract clear and free of accumulations of snow within the Limit of Work Line as required to carry out the work.

3.11 EROSION AND SILTATION CONTROLS

A. Install and maintain all erosion and siltation control measures as specified in the Contract Documents, and as required by the City of Woburn and other state and federal permitting agencies. The Contractor shall also maintain the site in compliance with the Stormwater Pollution Prevention Plan (SWPPP) for the site and maintain update the SWPPP as necessary for compliance under the NPDES Permit during the course of performing the work of this SECTION, at no additional cost to the Owner. See SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS.

END OF SECTION

SECTION 312219

FINISH GRADING

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 SCOPE OF WORK

A. Execute finish grades complete, as shown on the Drawings, and as specified herein.

1.03 RELATED WORK

A. The following related work is to be performed under the designated Sections.

1. Site Preparation – Section 311000
2. Earthwork – Section 312000
3. Soil Preparation – Section 329113
4. Lawns and Grasses – Section 329200

1.04 PROJECT/SITE CONDITIONS

A. Dust Nuisance: Assume full responsibility for alleviation or prevention of dust as a result of grading work.

1.05 SEQUENCING AND SCHEDULING

A. Regrade as required to finish grades and to the satisfaction of the Landscape Architect.

1.06 DEFINITIONS

A. References to Landscape Architect shall mean Architect or the Architects designated representative.

PART 2 PRODUCTS

2.01 EQUIPMENT: At Sub-Contractor's option.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that the following items have been completed prior to commencement of finish grading:

1. Installation of the topsoil and all soil preparation including debris removal.
2. Incorporation of soil amendments (as required by the Soil Testing Laboratory Report) and as otherwise specified.

3.02 INSTALLATION

A. Finish Landscape Grading

1. Provide all grading as shown on the Drawings and as specified.
2. Provide all grades for natural runoff of water without low spots or pockets. Accurately set flow line grades at 2 %minimum gradient unless otherwise noted in Drawings.
3. Finish grade all mulch areas, plant beds, lawn and sod areas by hand raking. Finish grades shall be smooth, even and on a uniform plane with no abrupt changes of surface. Slope uniformly between given spot elevations, unless otherwise shown on drawings.
4. Grades not otherwise indicated shall be uniform levels or slopes between points where elevations are given, or between points established by walks, paving, curbs or catch basins.
5. Tops and toes of all slopes shall be rounded to produce a gradual and natural appearing transition between relatively level areas and slopes.

B. Tolerances:

1. All planting areas, including lawn areas, shall be true to grade within 1 inch when tested with a 5 ft. straightedge.

END OF SECTION

SECTION 312319

CONTROLLED BLASTING

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine and be familiar with all conditions as they exist at the project site and project-related areas prior to submitting a bid for the work of this SECTION.

1.02 SCOPE OF WORK

A. Provide all supervision, labor, equipment, tools, materials, and other related services for the removal of rock, that may be encountered during construction of the Work as specified in the Contract Documents.

B. The Contractor shall obtain written permission, approvals, and all required permits or licenses from all authorities as required before proceeding with rock removal.

C. The Contractor shall refer to project requirements by the City of Woburn, Massachusetts.

D. Site preparation will be responsibility of the Contractor. The Contractor is to perform necessary excavation to remove overlying soil and rock to the limits specified in order to construct the Work. When bedrock or rock material, as defined herein, is encountered during the work, the Contractor shall perform pre-construction/pre-blast surveys, obtain permit(s) from the City of Woburn Fire Department, and remove by hydraulic “hoe-ram” hammer or blasting to the lines and grades indicated on the Contract Drawings.

E. The Contractor shall monitor vibrations and air blast overpressure levels at existing structures and protect from damage all existing structures and new work. The Contractor shall protect the abutting properties, workers and others on the site, and the general public from damage or injury from improper handling of explosives, flyrock, excessive ground vibrations and/or excessive airblast overpressure levels. It is intended that resulting ground vibrations and airblast overpressures are consistently maintained below the maximum levels specified in this Section.

F. The Contractor shall provide written notification to abutters along areas of work. The Contractor shall furnish, install and implement an audible warning system to indicate impending blasts. The Contractor shall inform workers, the Architect and their consultants/representatives (herein referred to as Architect), Owner, and the general public about the system implemented.

G. Definitions

1. Rock Removal is removal and disposal of materials, geologically classified as intact bedrock or boulders greater than one cubic yard (1 cy) in volume in trenches and greater than two point zero cubic yards (2 cy) in volume in open excavation which cannot be readily excavated and removed by the use of modern construction earth excavating equipment (Caterpillar 80,000 pound tracked excavator or equivalent). Rock Removal does not include loose, weathered, or fragmented rock. Trenches in excess of ten feet (10') in width and pits in excess of twenty feet (20') in either length or width are classified as open excavation.

2. Controlled blasting is blasting for later removal of rock by excavation, in which the various elements of the blast (hole size, depth, spacing, burden, charge size, distribution, delay sequence) are carefully balanced and controlled to provide a distribution of charge that will allow removal of the rock to the required contours with as uniform a surface as possible to minimize overbreak, ground and overpressure vibrations, stressing, and fracturing of the rock beyond the contour line. Smooth wall blasting, pre-splitting, cushion blasting, and line drilling are examples of operations included in the term "controlled blasting".

H. The Contractor shall employ and implement all methods required to effectively control dust created by the Work of this Section.

I. Limits of Work

1. Bedrock, as defined herein, shall be removed for the Work specified in the Contract Documents to the lines and grades shown in the Contract Documents or as otherwise directed by the Architect.

I. Per City of Woburn regulations, rock shall not be processed on site, and shall be removed from the site.

1.03 RELATED SECTIONS

A. Carefully examine all of the Contract Documents for requirements which affect the work in this section, including:

1. Section 31 10 00 – Site Preparation

2. Section 31 20 00 – Earthwork

1.04 MEASUREMENT AND PAYMENT

A. Controlled blasting procedures, blast monitoring and other work specified in this Section will not be measured separately for payment, but shall be considered incidental to the work specified in other related earthwork specifications.

B. Refer to SECTION 312000-EARTHWORK for quantities of rock removal to be carried in the base bid, and for measurement and payment for rock removal. The contract amount shall be adjusted upward or downward based on the actual quantities removed in accordance with SECTION 012200-UNIT PRICES.

1.05 REFERENCE CODES AND SPECIFICATIONS:

The Contractor shall comply with the provisions of the following Codes and Standards, except as otherwise noted:

A. Commonwealth of Massachusetts - Board of Fire Prevention Regulations - 527 CMR: Section 13.00 latest revision.

B. Associated General Contractors of America, Inc. - "Manual of Accident Prevention in Construction".

C. National Fire Protection Association (NFPA) - 495 Code for the Manufacture, Transportation, Storage and Use of Explosive Materials.

D. Occupational Safety and Health Act of 1970 (Public Law 91-596 of the United States, 29 USC Section 651 et seq.).

E. U.S. Treasury Department, Bureau of Alcohol, Tobacco, and Fire Arms regulations.

F. Applicable provisions of local laws and ordinances, and any requirements of the Chief of the Fire Department of the City of Woburn, Massachusetts.

G. In case of conflict between regulations or between regulations and specifications, the Contractor shall comply with the strictest applicable codes, regulations, or specifications.

1.06 SUBMITTALS

A. At least fourteen (14) working days prior to commencing drilling and blasting operations, the Contractor shall submit for review by the Architect complete details of the Contractor's proposed blasting operations, including the following:

1. Sequence and schedule of blasting rounds, including the estimated start and completion dates of blasting, general method of developing the excavation and direction the blasting will advance, lift heights in various portions of the site, pre-splitting, etc. As much as possible, consistent with safety at the site, the free face shall be maintained such that it faces away from nearby structures.

2. Details of a typical production round for blasting areas closest to the existing structures and for pre-splitting. The details shall include, but not be limited to, the following:

a. Diameter, spacing, burden, depth, and orientation of each drill hole.

b. Type and nomenclature of detonators and delay pattern.

c. Type, nomenclature, and weight per cartridge of explosives to be used, and weight and distribution of charge to be used within each hole, as well as total weight for the blast round.

d. Type and distribution of stemming to be used in each hole.

e. Estimates of ground vibration and air blast overpressure levels at all surrounding structures within three hundred and fifty feet (350') of blast areas. .

f. Type, sequence and number of delays, and delay pattern; wiring diagram for blast; size and type of hookup lines and lead lines; type and capacity of firing source; type, size and location of safety switches, lightning gaps.

3. Specific measures to be taken to protect near-by existing and proposed structures.

4. Type and methods of matting or covering of blast area to prevent flyrock, including, but not limited to, minimum size, weight and number of mats to be used.

5. Written evidence of the licensing, experience, and qualifications of blasters(s) and supervisor who will be directly responsible for the loading, firing, and directing of each shot.

6. Name, qualifications, and previous experience of the blast supervisor responsible for designing and directing the blasting and the person responsible for monitoring the vibration and air blast overpressure levels. The blast supervisor shall have a minimum of five (5) years experience in the removal of bedrock by blasting. The monitoring personnel shall have a minimum of five (5) years experience in the use of and interpretation of seismographs for measuring blast vibrations and air blast overpressure levels.

7. A listing of instrumentation which the Contractor proposes to use to monitor vibrations and air blast overpressure levels, together with performance specifications and user's manual supplied by the manufacturers, and a recent calibration on a shaking table (within the previous six [6] months) to a standard traceable to the National Bureau of Standards.

8. A copy of the blasting permit obtained by the Contractor to conduct blasting on the site.

9. Method of communication from Contractor personnel at the site back to personnel at the blast area to confirm that the "Danger Area" is secured prior to blasting, and to alert personnel and the public.

10. Depiction of all areas where pre-splitting or line drilling will be employed, including the technique, pattern/sequence, etc., of pre-splitting operations necessary to satisfy the intent of the Specifications and Drawings.

11. Pre-blast surveys performed as specified herein.

12. Written notification letter to abutting property owners.

13. Insurance Certificate demonstrating the insurance requirements specified herein are met.

B. The Contractor shall complete, maintain, and submit permanent blast reports, including logs of all blasts. Prior to detonating the blast, a preliminary blast report shall be provided to the Architect for review. Final reports shall be submitted to the Architect, in a timely manner, but in no case more than two (2) working days following each blast. The records shall include the following information:

1. Date, exact firing time, and limits of blast by elevation and location.

2. Name of person in responsible charge; blasting permit number.

3. A log of each borehole drilled (maintained by driller) indicating the depth to unusual joint or seam conditions encountered in the rock, problem zones, changes in penetration rate, and other indications of joints or open seams.

4. Type and strength of explosives, blasting caps, and distribution of delay periods used.

5. Total explosive loadings per round and per group of delays.

6. On a diagram of the reviewed test pattern, indicate any holes not drilled, drilled but not loaded, changes in spacing, changes in pattern of delays or changes in loading or stemming of holes.

7. Prevailing weather conditions, including direction and approximate velocity of wind, atmospheric temperature, relative humidity, and cloud conditions at the time of blast.

8. Comments by blasters in charge regarding any misfires, unusual results, or effects.

9. An evaluation of the blast indicating fractures, areas of significant overbreak, and any recommended adjustments for the next blast.

10. Signature and title of person making record entries.

11. Measured vibration and air blast overpressure levels obtained by the Contractor.

Copies of the blast reports shall be made available for review at the site by the Owner, Architect and an authorized representative of the City of Woburn Fire Department.

1.07 PROJECT CONDITIONS

A. Safety Requirements

1. Perform work in a manner to minimize safety hazards and exposure of personnel and equipment to hazardous and potentially hazardous conditions.

2. During the progress and approach of a thunderstorm, the handling or use of explosives shall be discontinued, and all personnel shall be moved to a place of safety until the danger has passed.

3. All parts of an electrical blasting circuit shall be effectively insulated or protected from grounds or short circuits so as to prevent any possibility of electrical contact or entrance of stray current into the blast circuit.

4. Mobile transmitters shall not be energized near electric caps or delays being handled or used. If electric blasting caps are used, every effort shall be made to ensure that they are properly wired into the circuit and that ample current is supplied to fire the blast. It is equally important, when using a straight parallel hookup, to follow the manufacturer's instructions explicitly as to cutting off the current supply with the first cap or caps to fire in order to prevent possible arcing, which could result in a "hang-fire" (delay explosion).

5. The Contractor shall be responsible for determining any other safety requirements unique to his blasting operation on this particular site so as not to endanger life, property, utility services, any existing or new construction, or any property adjacent to the site. The Contractor shall assess the impact of the existing slope of adjacent residences to the north and south of the site on his proposed blasting program and adjust said program accordingly.

6. No requirement of or omission to require any precautions under this Contract shall be deemed to limit or impair any responsibility or obligations assumed by the Contractor under or in connection with this Contract; and the Contractor shall at all times maintain adequate protection to safeguard the public and all persons engaged in the work, and shall take such precautions as will accomplish such end, without undue interference with the public. The Contractor shall be responsible for and pay for any damage to adjacent structures and injury to all persons resulting from work executed under this Contract.

B. Warning Signs

1. Erect signboards of adequate size stating that blasting operations are taking place in the area. Such signs shall be clearly visible at all points of access to the area and contain information similar to:

"KEEP OUT - DANGER"

"BLASTING AREA"

Similar warning signs shall be posted at fifty-foot (50') intervals along the perimeter of the blast areas.

2. Utilize a reliable warning system, incorporating audible signals established for the project, to ensure that all personnel in the area are forewarned of the impending detonation of explosives. First warning signal shall be sounded a minimum of three (3) minutes prior to blast.

3. Any site where electrical blasting caps are located or where explosive charges are being placed or have been placed shall be designated as a "Blasting Area". A "Blasting Area" within three hundred feet (300') of any traveled way shall be marked by approved signs with information similar to the following:

   "BLASTING AREA. TURN OFF RADIO TRANSMITTERS"

   and on the reverse side:

   "END OF BLASTING AREA"

4. No blasting shall be permitted until all personnel in the danger zone have been moved to a place of safety. A suitable warning system shall be devised and implemented by the Contractor. The Contractor shall familiarize all personnel on the project and the general public with the implemented system. The danger zone shall be patrolled before each blast to make certain that it has been completely cleared, and guards shall be stationed to prevent entry until the area has been inspected by the blasters following the blasts.

C. Fences

1. The Contractor shall construct and maintain temporary fences enclosing all areas to be excavated to a depth of six feet (6') or greater with an excavation support system and such other areas where necessary to comply with OSHA safety regulations.

2. Fences shall be constructed in accordance with OSHA safety regulations and located a safe distance away from the edge of excavation and be at least six feet (6') in height, unless prohibited by and governmental body, legal authority or court of law.

D. Blasting

1. Blasting shall be conducted Monday through Friday between the hours of 8:00 a.m. and 4:30 p.m. unless otherwise limited by permit. No blasting shall be conducted outside of these hours or on weekends or holidays, unless written approval is received from the Owner or Architect.

2. Blasting shall be executed only by personnel having required state and local licenses for blasting and for storage and transport of explosives.

E. Traffic Control and Barricades

1. The Contractor shall schedule operations so to minimize interference with vehicular and pedestrian traffic adjacent to the work area.

2. The Contractor shall provide all the necessary traffic cones, barricades, and signs needed and as requested by the Owner for the safe flow of traffic and to protect private and public property.

3. The Contractor shall maintain the safe flow of traffic along the adjacent roadways throughout the duration of the work and shall coordinate all activities with the Owner.

4. The Contractor shall provide and arrange for such police details as the Owner or local municipal authority deems necessary to maintain and protect the safe slow of traffic or temporary stop of traffic along adjacent roadways.

1.08 COMPLAINTS

A. Report all blasting complaints to the Owner within twelve (12) hours of receipt thereof. Include the name, address, date, time received, date and time of blast complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Assign each complaint a number, and number all complaints consecutively in order of receipt.

B. Immediately notify the Owner, throughout the statutory period of liability, of any formal claims or demands made by attorneys on behalf of claimants or of serving of any notice, summons, subpoena, or other legal documents incidental to litigation, and of any out-of-court settlement or court verdict resulting from litigation.

C. When settlement of a claim is made, furnish the Owner with a copy of the release of claim by the claimant.

D. Immediately notify the Owner of any investigations, hearings, or orders received from any Governmental agency, board, or body claiming to have authority to regulate blasting operations.

1.09 QUALIFICATIONS

A. Blast Vibration Consultant. The Contractor shall engage the services of a qualified, independent Professional Engineer or blasting vibrations consultant to conduct a pre-blast and post-blast conditions survey of adjacent structures.

B. Seismic Survey Contractor: The company providing blast monitoring services must be trained in the use of a seismograph; records shall be analyzed and results reported by persons familiar with the seismograph record.

C. Blasting Contractor. The company providing blasting services for disintegration and excavation of rock must be licensed blasters in the Commonwealth of Massachusetts and have at least five years experience in similar excavation of rock and controlled blasting techniques.

1.10 REGULATORY REQUIREMENTS AND PERMITS

A. The Contractor shall comply with applicable laws, rules, ordinances, and regulations of the Federal Government, the Commonwealth of Massachusetts, and the City of Woburn governing the transportation, storage, handling, and use of explosives. All labor, materials, equipment, and services necessary to make the blasting operations comply with such requirements shall be provided without additional cost to the Owner.

B. The Contractor shall obtain excavation and blasting permits and licenses from the City of Woburn and Commonwealth of Massachusetts agencies before explosives are brought to a site or drilling is started.

C. In case of conflict between regulations or between regulations and Specifications, the Contractor shall comply with the strictest applicable codes, regulations, or Specifications.

1.11 SCHEDULING

A. The Contractor shall coordinate the general blasting schedule with the Owner and shall notify the Owner and City of Woburn of individual blasts when requested. The Contractor shall notify the Owner a minimum of twenty-four hours in advance of the start of blasting in any new area.

1.12 INSURANCE

A. The Contractor shall have general liability insurance coverage of at least $1,000,000. The Owner, Architect and their consultants shall be additionally named insureds on insurance policies covering blasting. Provide certificate of insurance to Owner and Architect as part of qualifications submittal.

1.13 PRE-BLAST SURVEY

A. Prior to the start of blasting, the Contractor, or the Contractor's authorized representative, shall perform pre-blast surveys of all surrounding structures, within three hundred and fifty feet (350') of blast areas. The pre-blast survey must document any pre-existing damage to structures and buildings and any other physical features within the survey radius that could reasonably be affected by blasting. Assessment of features such as pipes, cables, transmission lines and wells and other water supply systems may be limited to surface conditions and other readily available data, such as well yield and water quality. The pre-blast survey must be conducted prior to the initiation of controlled blasting operations. The pre-blast survey shall consist of a narrated videotape or still photographs accompanied by written narrative of both the interior and exterior of structures. Two copies of the surveys shall be provided to the Owner for review prior to commencing blasting. The surveys shall be performed by a qualified firm, experienced in performing pre-blast surveys. Copies of all pre-blast surveys shall be provided to the Owner and must be retained by the Contractor for at least one year from the date of the last blast on the site.

B. It shall be the responsibility of the Contractor to notify and coordinate with the structure owners for the pre-blast survey. Advise the Owner of the dates on which surveys are to be made so that they may have representatives present during the examination.

C. Upon completion of blasting, the Contractor shall make a similar examination of properties and structures where complaints of damage have been received or damage claims have been filed. Give notice to interested parties so that they may be present during the final examinations.

1.14 INDEMNITY

A. Notwithstanding full compliance with these specifications, review of blasting plan, and successful limitation to maximum peak particle velocities and air-blast overpressure as specified herein, the Contractor shall be solely responsible for any damage, direct, indirect, or consequential, arising from blasting and shall defend and hold the Owner, Architect and their consultants, engineers and architects harmless from any cost, liens, charges, claims, or suits, including the costs of defense, arising from such damage, real or alleged.

B. Review of the blast design and techniques by the Architect shall not relieve the Contractor of total responsibility for the accuracy, adequacy, and safety of the blasting, exercising proper supervision and field judgment, and producing the results within the blasting limits required by these Specifications.

1.15 PROTECTION OF COMPLETED WORK

A. The Contractor shall conduct the blasting operations in such a manner that completed work of any type is not damaged. Any replacement or repair of damaged work shall be directed by the Owner and shall be made at no additional cost to the Owner. No blasting shall be done within 200 feet of concrete, shotcrete or grout which has been in place less than seven (7) days nor within 50 feet of any concrete, shotcrete or grout which is older than seven (7) days unless authorized by the Owner.

PART 2 PRODUCTS

2.01 EXPLOSIVES

A. Only explosive and initiation devices packaged by federally licensed explosives manufacturing firms shall be used in blasting.

B. Ammonium nitrate fuel oil (ANFO) or other bulk loading shall not be used, unless otherwise approved by the Owner. Cartridge or packaged dynamites, slurries, or water gels shall be used.

PART 3 EXECUTION

3.01 GENERAL

A. Notify the Architect and Owner at least forty-eight (48) hours before any intended blasting.

B. Notify all parties owning or operating subsurface utilities within five hundred feet (500') of the blast area seventy-two (72) hours before commencing blasting operations.

C. Notify all abutters and those within three hundred fifty feet (350') of blast areas in writing of schedule of blasting at least one week before the commencement of blasting. The schedule shall give starting dates and times and estimated completion dates for the blasting periods. The blasting schedule shall be updated from time to time to reflect adjustments to the blasting program and such updated schedule shall be provided to all abutters and those within three hundred feet (300') of the blast areas. A notice of completion of blasting will be sent to the City of Woburn Fire Department and Building Department and to all abutters and three hundred feet (300') of the blast areas within 15 days after all blasting at the site is completed.

D. The Contractor shall present evidence that the Contractor's insurance includes coverage for blasting operations before commencing blasting work.

E. The Contractor shall employ controlled blasting procedures in order to maintain ground vibrations and air blast overpressure below the maximum levels specified in this Section, or as required to avoid distress to existing structures and equipment.

F. The logs of all drill holes shall be reviewed by the driller and blasters prior to loading any round.

G. Cover all blasts with sufficient mats of suitable design and in good condition as to contain all blasted rock and to prevent all flyrock from leaving the immediate vicinity of the blast.

H. Any damage caused by the work of the Contractor shall be repaired to the full satisfaction of the damaged party and the Owner at no additional cost to the Owner. This includes the cost of the loss of service to utility customers and the loss of profits related to that service.

I. Limit time of blasting to daytime hours, as specified herein.

J. Obtain seismic survey prior to rock excavation to determine maximum charges that can be used at different locations in area of excavation without damaging adjacent buildings or other work.

K. The Contractor shall be implement safety requirements unique to blasting operations on this site so as not to endanger life, property, utility services, existing or new construction, or adjacent properties.

3.02 SURVEY OF ROCK SURFACE

A. The Contractor shall be responsible for performing a survey of the top of rock surface prior to blasting. The survey shall be performed on a 2-foot grid, after exposing the rock surface. The grid shall be marked/spray painted and/or staked such that the Owner's surveyor can perform an independent survey of the rock surface.

B. No blasting, nor drilling for blasting within an area, of the site will be permitted until the survey for that area is complete and accepted by the Owner.

3.03 DRILLING AND BLASTING

A. Explosives shall be stored, handled, and employed in accordance with federal, state, and local regulations, and in accordance with NFPA 495, except that where stricter requirements are contained herein, such requirements shall govern.

B. During freezing weather, take special precautions as to the care and manipulation of dynamite.

C. Store explosives on the site during blasting hours in approved magazines protected from construction traffic. Do not store caps and exploders in the same magazine with dynamite and other explosives.

D. Truck all explosives to the site at the start of each work day. Remove surplus explosives from the site at the close of each day. No explosives shall be stored at the site overnight. Do not transport caps and other exploders in the same transport vehicle with dynamite and other explosives. The location of parking for explosives trucks are subject to the approval of the Owner.

E. Do not remove a larger quantity of explosives from the magazine to the location of the work than will be actually required for immediate use. Return any excess to the magazine as soon as the loading of the working face is completed. Do not leave blasting materials in the holes for extended periods of time.

F. Before the firing of any blast, cover the rock to be blasted with matting consisting of suitable rubber matting with adequate overlap and coverage, or some other equally serviceable material, to prevent any blasted rock or flyrock from clearing the immediate area of the blast. Provide at least two (2) layers of mats and mat coverage a minimum of five feet (5') beyond the edge of the drill holes. Mats shall be maintained in good condition. Any damaged or frayed mats or mats with holes in them shall not be utilized.

G. Use controlled blasting techniques and control ground vibrations, noise (air blast overpressure), and overblast. Modify the blasting round as necessary to achieve the best obtainable results and to keep the vibrations and noise within the limits herein specified.

H. The Contractor shall use high-precision millisecond delay detonators for all blasts involving more than eight (8) loaded holes.

I. Blasting shall not be permitted until all personnel in the danger area have moved to a safe place. A loud audible warning system, devised and implemented by the Contractor, shall be sounded before each blast. The danger area shall be patrolled before each blast to make certain that it has been completely cleared. Station guards to prevent entry until the blaster has cleared the area following the blast.

J. In the event that vibrations which reach surrounding structures or facilities exceed as the vibration criteria established herein or otherwise result in damage to structures, the Contractor shall change procedures(s) to reduce vibrations to acceptable levels, including the reduction of the size of the loads, the use of millisecond delay detonators, or other appropriate measures.

K. The Contractor shall muck out after each round to maintain a free face and adequate relief for the next round; and to be able to observe open seams, backbreak, or other potential flyrock problems at the face. Over blast, consisting of nested boulder with voids, shall be removed before placing fill.

L. Drilling of blast holes shall employ necessary means of controlling dust.

3.04 DISPOSAL OF MATERIAL

A. All excavated material not reused on site shall become the property of the Contractor and shall be disposed of off-site in a legal manner. The cost of off-site disposal shall be included in the lump sum price.

B. A rock crushing plant shall not be located onsite.

C. All trucks shall be properly covered while hauling excavated material.

3.05 BLASTING NOISE AND VIBRATION CONTROL

A. General

1. Notify the Architect, City of Woburn Fire Department, and Owner fifteen (15) minutes prior to each blast.

2. Compliance with the requirements of this section will not offer any relief from responsibility for compliance with local ordinances, regulations, and other sections.

3. In the event that a blasting round results in ground vibrations or air blasting overpressure which exceed the blasting limit criteria specified herein, or that results in unacceptable flyrock in the judgment of the Architect or Owner, the Contractor shall stop work and, prior to detonating any subsequent round, revise his round design appropriately to reduce the vibrations and air blast overpressure below the limit criteria specified herein and to eliminate unacceptable flyrock and shall submit the revised round design for review by the Owner and Architect.

B. Monitoring

1. The Contractor shall monitor noise and vibration levels during blasting for compliance with the limitations contained herein and retain records of measurements for immediate inspection by the Architect. Submit data as specified herein.

   The Contractor shall monitor noise and vibration levels associated with each blast at the closest off-site business or residential structure to the blast area and at the closest on-site structure.

2. Promptly inform the Owner of any complaints received from the public regarding noise or vibration. Describe the action proposed and the schedule for implementation and subsequently inform the Owner of the results of the action.

3. The Owner may engage an independent Geotechnical Engineer to observe blasting operations and review the Contractor's records of blast round design, including hole diameter, spacing, loading, delay pattern, number of mats used, condition of mats, etc. The Geotechnical Engineer may also monitor resulting blast vibrations, both ground vibration and air blast overpressure.

4. The Geotechnical Engineer's presence does not include supervision or direction of the actual work by the Contractor, its employees, or agents. Neither the presence of the Geotechnical Engineer nor any observations and testing performed by him, shall excuse the Contractor from defects discovered in its work or damage to third parties.

C. Ground Vibration Due to Blasting

1. General

The Contractor shall conduct blasting operations in such a manner as to avoid damage to structures, buildings or equipment and to prevent the maximum peak particle velocity of blast-induced motion from exceeding the limits specified below. These limits shall apply to all residential and commercial structures, and utilities except as otherwise noted.

Predominant Frequency (Hz)	Maximum Peak Particle Velocity (PPV)*(inches per second)
< 20	0.5
20-30	0.75
> 30	1.0

2. Emergency Blasting

a. Notify the Owner, Architect, police and fire departments at least one hour prior to starting Emergency Blasting.

b. Control Emergency Blasting required to protect the safety of the project during the nighttime period to prevent peak particle velocity of ground vibration at any building outside the Construction Limits and having nighttime occupancy from exceeding 0.2 inches per second.

c. If the emergency arises from inability to fire loaded holes within the daytime period solely due to unavoidable conditions, peak particle velocity of ground vibration shall not exceed 0.2 inches per second at the nearest building, structure and duct bank without specific approval of the Owner.

3. Special Measures

a. The Contractor's attention is also directed to the fact that special measures in the form of pre-splitting may be required wherever a near vertical rock face is required or if previous blasting at the site indicates significant and undesirable overbreak may result, in the opinion of the Architect or Owner. Maximum finished rock slopes shall be no steeper than 1 horizontal to six vertical (1H:6V). The Contractor may be required to pre-split before any production blast within one hundred feet (100') of anticipated near vertical faces. Pre-splitting may also be required in other critical areas of the site as defined by the Architect or Owner.

D. Noise (Overpressure) Due to Blasting

1. Conduct daytime blasting in such a manner as to limit peak air blast overpressure to 0.014 psi at any structure within three hundred fifty feet (350') from the Construction Limits. Allowable noise levels (dBAs) shall not exceed applicable restrictions specified in 527 CMR: Section 13.09:9, Table 3 or 1.33 dB peak, whichever is smaller.

2. Perform construction operations related to blasting activities in a manner to minimize noise. Provide working machinery and equipment with efficient noise suppression devices and employ other noise abatement measures necessary for protection of both employees and the public. In no case expose the public to construction noise levels exceeding 85 dBA (slow) or to impulsive noise levels with a peak sound pressure level exceeding 120 dBA (fast).

E. Test Blasts

1. Perform at least three (3) small charge test blasts at Contractor selected locations at the excavation site prior to production blasting. The purpose is to establish local ground-borne vibration and airborne overpressure propagation characteristics and anomalies to aid in determination of efficient charges that will not cause the ground-borne vibration and airborne overpressure limits to be exceeded.

2. Coordinate scheduling of each test blast with the Owner and Architect. Notify all parties owning or operating subsurface utilities within five hundred feet (500') and businesses and residents within three hundred fifty feet (350') of the perimeter of the site in accordance with Paragraphs 3.1.B and 3.1.C of this specification. The Contractor shall allow the Owner and Architect two (2) working days) to review monitoring data and evaluate criteria.

3.06 PRODUCTION BLASTING PROCEDURES

A. Disintegrate rock and remove from excavation.

B. Remove rock at excavation bottom to form a level bearing.

C. Refer to SECTION 312000-EARTHWORK for extent of rock removal for utilities and site improvements.

D. Correct unauthorized rock removal in accordance with backfilling and compaction requirements of Section 312000-EARTHWORK.

3.07 FIELD QUALITY CONTROL

A. If specified vibration limits are exceeded, and if the Architect deems that continued blasting would threaten the integrity of a structure, the Contractor shall be required to stop blasting in the vicinity of these structures and fragment the remaining rock near the structure using non-explosive techniques at no additional cost to the Owner.

END OF SECTION

SECTION 312500

EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 SCOPE OF WORK

A. Work in the section includes providing labor, materials and equipment necessary to install control measures to prevent erosion, siltation and sedimentation of the Project site and adjacent off-site areas.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following related work is to be performed under the designated SECTIONS.

1. SECTION 311000 – SITE PREPARATION
2. SECTION 312000 – EARTHWORK
3. SECTION 312319 – CONTROLLED BLASTING

1.04 SUBMITTALS

A. Section 013300 - Submittals: Requirements for submittals.

B. Product Data: Product Data: Submit data on siltation fence, tubular sediment barrier, erosion control blanket, catch basin inserts, each type of proprietary erosion control devices, and geotextile.

C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.05 CLOSEOUT SUBMITTALS

A. Section 017700 – Project Closeout: Requirements for submittals.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with the requirements of the Stormwater Pollution Prevention Plan (SWPPP) issued under the Notice of Intent to U.S. EPA.

PART 2 PRODUCTS

2.01 MATERIAL

A. Straw Bales (if needed): bales of straw, bound with wire or nylon twine oriented around sides, rather than over and under the bales.

B. Stakes: Stakes for bales as indicated on Drawings.

C. Silt Fence: Prefabricated unit consisting of the following:

1. Requirements:

a.	Grab Tensile Strength (lbs./in.)	90	ASTM D1682
b.	Elongation at Failure (%)	50	ASTM D1682
c.	Mullen Burst Strength (psi)	190	ASTM D3786
d.	Puncture Strength (lbs)	70	ASTM D751
e.	Equivalent Opening Size CW-02215	40-80	US Std Sieve
f.	Ultraviolet Radiation Stability (%)	90	ASTM G26

2. Manufacturers:
   a. Tencate - Mirafi Envirofence
   b. Contech
   c. Propex Geotex.

D. Tubular Sediment Barrier: Tubular netting filled with water permeable compost material meeting the following requirements.

1. Compost:
   a. Derived from a well-decomposed source of organic matter.
   b. Free of weeds, refuse, contaminants or other materials toxic to plant growth. Non-composted products will not be accepted.
2. Tubular Netting:
   a. One continuous barrier.
   b. Twelve inches in diameter.
   c. Equal to the following:
      1) Silt Soxx by Filtrexx
      2) Silt Sock
      3) FilterMitt by Phase II Stormwater Products, Inc

E. Erosion Control Blanket: machine produced 100% biodegradable blanket. Equal to:

1. North American Green Bionet 150BN

F. Catch basin Inserts: permeable geotextile fabric that mounts under the grate of catch basins.

1. ACF Environmental Silt Sack
2. UltraTech International, Inc. Ultra-Drain Guard
3. Enpac 1341 Catch Basin Insert

G. Temporary Stabilization Practices:

1. Straw temporary mulch, 100 pounds per 1,000 square feet.
2. Wood fiber cellulose temporary mulch, 35 pounds per 1,000 square feet.
3. Tackafier for anchoring mulch or straw: a non-petroleum based liquid bonding agent specifically made for anchoring straw.
4. Provide natural (jute, wood excelsior) or man-made (glass fiber) covering with suitable staples or anchors to secure to ground surface. Do not use wire staples and non-biodegradable coverings for any area that will be mown turf.
5. Temporary vegetative cover for graded areas must be undamaged and free of undesirable weed seed.
6. Spray-applied bonded fiber matrix.

H. Construction Entrance Materials:

1. Stone size: ASTM designation C-33, size No. 2 (1-1/2 inches to 2-1/2 inches).
2. Base Course: Crushed stone.

I. Mulch: Where specified in Drawings.

J. Bonded Fiber Matrix: A hydraulically applied slurry consisting of long strand wood fibers, organic tackifiers and bonding agents, when dry forms a continuous erosion control blanket bonded to the soil surface. Equal to:

1. Geoperm Bonded Fiber Matrix
2. Mat, Inc. Soil Guard
3. Profile Products Flexter

PART 3 EXECUTION

3.01 EXAMINATION

A. Section 011000 – Summary of Work: Verification of existing conditions before starting work.

B. Verify existing depth of loam and depth of subbase.

C. Verify gradients and elevations of base and foundation for future work are correct.

3.02 PREPARATION

A. Install control measures prior to construction to prevent erosion, siltation and sedimentation of construction areas, adjacent areas and off-site areas in the following work areas:

1. Soil stockpiles, storage and staging areas;
2. Cut and fill slopes and other stripped and graded areas;
3. Constructed and existing swales and ditches;
4. As indicated on Drawings.

B. Provide additional means of erosion and sediment control as required for continued or unforeseen erosion problems.

C. Provide means to prevent sedimentation from being tracked onto public right-of-way.

3.03 GENERAL

A. Install and maintain site erosion and sediment controls as indicated on Drawings.

3.04 STABILIZED CONSTRUCTION ENTRANCE AND STONE BERMS

A. Place stone entrances in locations indicated on Drawings

B. Length: As indicated on Drawings, minimum 50 feet.

C. Thickness: As indicated on Drawings.

D. Width: Not less than full width of all points on ingress or egress, as indicated on Drawings.

E. Washing: Spray wash truck wheels leaving the Project site, when necessary, to remove sediment prior to entrance onto public right-of-way. Perform wheel washing in an area stabilized with crushed stone which drains into an approved sediment trap or sediment basin. Prevent all sediment from entering any storm drain, ditch, or watercourse through the use of straw bales, catch basin inserts, silt fence or other approved methods.

F. Maintenance: Maintain the entrance to prevent tracking or flowing of sediment onto public rights-of-way. Provide periodic top dressing with additional stone as conditions demand. Repair and/or clean devices used to trap sediment. Sediment spoiled, dropped, washed or tracked onto public rights-of-way must be removed immediately.

3.05 STRAW BALE BARRIERS (if needed)

A. Excavate the width of the bale and the length of the proposed barrier to a minimum depth of 6 inches.

B. Place bales in a single row, lengthwise on proposed line, with ends of adjacent bales tightly abutting one another.

C. In swales and ditches where strawbale checkdams are to be installed, extend barrier to a length where end bales are higher in elevation than the top of the lowest middle bale.

D. Anchor bales by driving at least two stakes or rebars through each bale as indicated on Drawings.

E. Wedge straw in the gaps between bales to prevent water from escaping between the bales.

F. Backfill excavated soil against the straw barrier. Backfill to match ground level on the downhill side and built up to 4 inches on the uphill side.

3.06 SILT FENCING

A. Excavate a trench along the upstream side of the desired fence location as indicated on Drawings.

B. Install fence, staked at a maximum of 4-foot intervals in locations indicated on Drawings. Specifically protecting adjacent residential properties.

C. Lay silt fence into the trench as indicated on Drawings. Backfill trench and compact.

D. Overlap joints in silt fencing, as indicated on Drawings, to prevent leakage of silt at seams.

3.07 TUBULAR SEDIMENT BARRIER

A. See Drawings and manufacturer's recommendations for installation.

3.08 SITE STABILIZATION

A. Incorporate erosion control devices indicated on Drawings into the Project at the earliest practicable time.

B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.

C. Do not exceed 35 feet height for stockpile(s) and waste pile(s). Slope stockpile(s) sides at 2:1 or flatter.

D. Provide appropriate temporary stabilization of any disturbed area on which activity has ceased and which will remain exposed for more than 14 days.

1. Provide temporary seed mix with application rates according to the State of Massachusetts DOT Standard Specifications.

a. Water the seeded areas as required until satisfactory establishment.

2. During non-germinating periods, apply mulch at recommended rates.

E. Provide permanent stabilization of disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with permanent seeding specifications or as indicated on Drawings with one of the following:

1. Application of Bonded Fiber Matrix hydroseed seed mix as specified.

2. Placement of erosion control blanket as indicated on Drawings.

F. Stabilize diversion channels, sediment traps, and stockpiles immediately.

3.09 SLOPE STABILIZATION (SLOPES OF 4:1 OR GREATER)

A. Do not leave disturbed areas and slopes unattended or exposed for excessive periods of time such as the inactive Winter season. Provide appropriate stabilization practices as indicated on Drawings on disturbed area as soon as possible, but not more than 14 days after the construction activity in that area has temporarily or permanently ceased.

B. Reinforce temporary areas having a slope greater than 4:1 with erosion control blankets or approved equivalent until the site can be properly stabilized.

C. Provide permanent slope stabilization immediately after the placement of topsoil. Provide permanent stabilization as indicated on Drawings with one of the following:

1. Apply hydroseed seed mix as specified.
2. Application of Bonded Fiber Matrix hydroseed seed mix as specified.
3. Placement of erosion control blanket as indicated on Drawings.

3.10 EROSION CONTROL BLANKET

A. As indicated on Drawings and or manufacturer's recommendations for installation.

3.11 BONDED FIBER MATRIX

A. As indicated on Drawings and/or manufacturer's recommendations for installation.

3.12 CATCH BASIN INSERTS

A. As indicated on Drawings and/or manufacturer's recommendations for installation.

3.13 FIELD QUALITY CONTROL

A. Inspect erosion and sediment control devices and stabilized slopes on a weekly basis and after each rainfall event of .25 inch or greater. Make necessary repairs of identified problems within 24 hours to ensure erosion and sediment controls are in good working order. Reset or replace materials as required.

B. When field visits indicate Work does not meet specified requirements, repair and/or replace Work.

C. Any deviation from the requirements provided must be approved by the Engineer.

3.14 CLEANING

A. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment barrier or device, remove and dispose of sediment.

B. Do not damage structure or device during cleaning operations.

C. Do not permit sediment to erode into construction or site areas or natural waterways.

D. Clean channels when depth of sediment reaches approximately one half channel depth.

3.15 PROTECTION

A. Do not permit construction traffic over stabilized areas.

B. Protect Project site stabilization from elements, flowing water, or other disturbance until vegetation established.

END OF SECTION

Division 32
Exterior Improvements

SECTION 329113

SOIL PREPARATION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 SCOPE OF WORK

A. Section Includes: This Section specifies administrative and procedural requirements for planting soils shown on the Drawings and specified herein or both.

1.03 RELATED WORK

A. The following related work is to be performed under the designated Sections.

1. Site Preparation – Section 311000
2. Earthwork – Section 312000
3. Finish Grading – Section 312219
4. Lawns and Grasses – Section 329200

1.04 REFERENCES

A. Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

B. Massachusetts Pesticide Control Act (MPCA, Chapter 132B of the Massachusetts General Laws). Chapter 333 of the Code of Massachusetts Regulations (333 CMR).

C. ASA: American Society of Agronomy.

D. Recommended Soil Testing Procedures for the Northeastern United States, 2nd Edition, Northeastern Regional Publication No. 493.

1.05 DEFINITIONS

A. Subgrade: Soil material and levels resulting from the approved rough grading work.

1. Cultivation of all subgrade areas prior to placing topsoil is included in this section.

2. Subgrade soil(s): Subgrade soil shall be existing soil materials which are either undisturbed or have been placed resulting from the approved rough grading work and are located in lawn and planting areas.

B. Existing Subsoil: Soils that exist on the site below the existing topsoil in the lawns and planting areas.

C. Existing On-Site Topsoil: Existing Topsoil/Stripped On Site Topsoil that was stripped from the site.

1. On-site topsoil that has been stripped and stockpiled shall be screened of all foreign debris and stones larger than 1/2" and used ‘as is’ without amendments for areas of Seed Mix #1. Lime and fertilizer will need to be applied or part of the hydroseed mix as recommended by the testing laboratory.

D. Planting Soil: Screened Existing On-Site Topsoil used in seeded areas.

E. References to Landscape Architect shall mean Architect or the Architect's designated representative.

1.06 SEQUENCE

A. Refer to Section 312000 – Earthwork for removal and stockpiling of existing topsoil.

B. Screen the existing topsoil.

C. Test the existing topsoil at an approved testing lab to determine lime and fertilizer additive to add to the hydroseed mix or to apply to the areas of Seed Mix #1.

D. Scarify and recompression of the subgrade.

E. Installation and placement of soils.

F. De-compaction and re-compaction of soils.

G. Clean-up.

1.07 SUBMITTALS

A. Chemical analysis of amended topsoil shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer pH. Recommendations for pH adjustments and fertilizer soil amendments shall be included with all test reports.

B. Tests shall be conducted in accordance with Recommended Soil Testing Procedures for the Northeastern United States, 2nd Edition, Northeastern Regional Publication No. 493; Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and West Virginia. Tests include the following:

1. Test for soil Organic Matter by loss of weight on ignition, as described in Northeastern Regional Publication No. 493.
2. Test for soil CEC by exchangeable acidity method as described in Northeastern Regional Publication No. 493.
3. Test for soil Soluble Salts shall be by the 1:2 (v:v) soil: water Extract Method as described in Northeastern Regional Publication No. 493.
4. Test for Buffer pH by the SMP method as described in Northeastern Regional Publication No. 493.

C. Testing Agencies: The following firms are acceptable testing agencies for the various components.

1. Chemical Analysis:
   a. Pine and Swallow Environmental, 867 Boston Road, Groton, MA, 01450, tel: 978-448-9511.
   b. University of Massachusetts, West Experiment Station, Amherst, MA 01003, tel: 413.545.2311, fax: 413.545.1931.

1.08 MOCK UP AND INSPECTIONS

A. The Contractor shall not place Topsoil on prepared subgrade prior to inspection and approval of Landscape Architect for compliance with depth and compaction. The Contractor shall request inspection before proceeding at least ten working days prior to placement of soils.

1.09 QUALITY ASSURANCE

A. Delivery Storage and Handling

1. Refer to Earthwork for overall material handling requirements.

2. Material shall not be handled or hauled, placed or compacted when it is wet as after a heavy rainfall, early spring or if frozen. Soil shall be handled only when the moisture content is compliant with this Section.

3. Prohibit vehicular and pedestrian traffic on or around stockpiled planting soil, or any areas of prepared subgrade or placed planting soils.

4. Material that is to be stockpiled longer than two weeks, whether on or off site, shall not be placed in mounds greater than six feet high.

B. Soil Moisture Content

1. Contractor shall not move, blend or grade soil when moisture content is so great that free moisture is apparent, nor when it is so dry that dust will form in the air or that clods will not break readily, nor when frozen. Apply water, if necessary, or allow to dry to bring soil moisture between 60% of optimum moisture content and optimum moisture content as determined by ASTM D698 prior to compaction, grading or planting.

2. Field Soil Moisture Test

a. Form soil in palm of hand, if soil retains shape and crumbles upon touching, the soil may be worked.

b. If the soil will not retain shape it is too dry and should not be worked.

c. If the soil retains shape and will not crumble, it is too wet and should not be worked.

d. If the soil glistens or free water is observed when the sample is patted in the palm of hand the soil is too wet and should not be worked.

1.10 DEFINITIONS

A. References to Landscape Architect shall mean Architect or the Architect's designated representative.

PART 2 MATERIALS

2.01 MATERIALS

A. Stripping of Existing Topsoil

1. Existing topsoil must be stripped in a manner to ensure that subsoil is not mixed with the Existing Subsoil.

B. Soil Testing and Soils Testing Report Submittal

1. All soil testing shall be carried out by the Soils Testing Laboratory. Recommendations for amending the soil mix will be provided to the Contractor by the Landscape Architect.

C. Soil Samples: Contractor is responsible for paying costs for testing.

2.02 EXISTING TOPSOIL (PLANTNG SOIL) FOR SEED MIX #1 areas

A. All vegetation shall be removed from stockpiles prior to blending.

B. On-site topsoil that has been stripped and stockpiled can be screened of all foreign debris larger than 1/2" and used 'as is' without amendments for areas of Seed Mix #1.

C. Provide analysis to determine lime and fertilizer to be applied for Seed Mix #1 as determined by the testing laboratory.

1. Provide analysis to determine lime and fertilizer to be applied for Seed Mix #1 as determined by the testing laboratory.

2. Chemical analysis shall be undertaken for Phosphorus, Potassium, Calcium Magnesium, Aluminum, Copper, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer pH.

2.03 COMPONENTS: The following additives shall be used as applicable depending on the recommendations of the soils testing report(s).

A. Standard commercial pre-mixed and balanced pre-plant or lawn fertilizers which meet the recommendations of the Soils Testing Report(s).

B. Ground Limestone: Agricultural limestone containing not less than 85% of total carbonates, ground to such fineness that 50% will pass #100 sieve and 90% will pass #20 sieve.

C. Dolomite Lime: Agricultural grade mineral soil conditioner containing 35% minimum magnesium carbonate and 49% minimum calcium carbonate, 100% passing #65 sieve. "Kaiser Dolomite 65 AG" by Kaiser, Inc. or accepted equal.

D. Gypsum: Agricultural grade product containing 80% minimum calcium sulfate.

E. Iron Sulfate (Ferric or Ferrous): Supplied by a commercial fertilizer supplier, containing 20% to 30% iron and 35% to 40% sulfur.

F. Sulfate of Potash: Agricultural grade containing 50% to 53% of water-soluble potash.

G. Single Superphosfate: Commercial product containing 20% to 25% available phosphoric acid.

H. Ammonium Sulfate: Commercial product containing approximately 21% ammonia.

I. Ammonium Nitrate: Commercial product containing approximately 34% ammonia.

J. Calcium Nitrate: Agricultural grade containing 15-1/2% nitrogen.

K. Ureaform: Granular commercial product containing 38% nitrogen, and minimum 27% water insoluble nitrogen (WIN).

L. I.B.D.U. (Iso Butyldiene Diurea): Commercial product containing 31% nitrogen.

M. Soil Sulfur: Agricultural grade sulfur containing a minimum of 96% sulfur.

N. Iron Sequestrene: Geigy Iron Sequestrene 330 Fe, by Ciba-Geigy Corporation, (919) 292-7100, containing approximately 10% iron.

O. Potassium Nitrate: Agricultural grade containing approximately 13% nitrogen (N) and 44% potash (K20).

P. Trace Elements: FRIT Industries product 503 Micromax manufactured by Grace/Sierra or equal.

Q. Bone Meal: A fine ground, steam-cooked, packing house bone with a minimum analysis of (23) percent phosphoric acid and (1) percent nitrogen.

1. Bone meal shall be used for all bulbs in amounts as required by the Soils Lab.

2.04 COMMERCIAL FERTILIZER SUPPLIERS AND MIX BLENDERS

A. Sierra Chemical Co. (408-263-8080).

B. W. R. Grace and Co. (800-527-1893).

C. Or Equal.

2.05 ACCESSORIES

A. Water: Clean, fresh and potable. Transport as required.

PART 3 EXECUTION

3.01 STRIPPING OF TOPSOIL

A. All work areas within the limit of work requiring excavation and grading shall be stripped of topsoil to the extent necessary to satisfy project requirements. Topsoil shall be stripped in such a manner as to ensure that subsoil is not mixed with the loam. Topsoil that is contaminated with subsoil shall not be used as planting media within the project.

B. All topsoil so removed shall be stockpiled on the site where convenient for work operations and as approved by the Engineer/ Landscape Architect. Topsoil shall be free of subsoil, stiff clay or hardpan and foreign material such as cinders ashes, asphalt and wood. The suitability of stripped materials for use as topsoil shall be determined by the Engineer/Landscape Architect and his decision shall be final.

3.02 PRE-INSTALLATION EXAMINATION AND PREPARATION

A. Reference Other Sections as necessary.

B. Coordinate activities with other project Contractors so that there is no soil disturbance from traffic or other construction activities subsequent to placement.

C. Pre-Installation Examination Required: The Contractor shall examine previous work, related work, and conditions under which this work is to be performed and shall notify Landscape Architect and in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means Contractor accepts substrates, previous work, and conditions. The Contractor shall not place any planting soil until all work in adjacent areas is complete and approved by the Landscape Architect.

D. Examination of Subgrade: The subgrade shall be examined by the Contractor prior to the start of subgrade preparation, soil placement and planting. Any deficiencies shall be noted and related to the Landscape Architect and in writing prior to acceptance of the subgrade by the Landscape Contractor. Deficiencies include, but shall not be limited to the following:

1. Construction debris present within the planting areas.
2. The subgrade is at incorrect depths for installing the designed soil profile.

E. Confirm that the subgrade is at the proper elevation and compacted as required. Subgrade elevations shall slope parallel to the finished grade and/or toward the subsurface drain lines as shown on the drawings.

1. All subgrade areas to be filled with Planting Soils shall be free of construction debris, refuse, vegetation, compressible or decay able materials, all stones greater than 2 inches, concrete washout or soil crusting films of silt or clay that reduces or stops drainage from the Planting Soil into the subsoil; and/or standing water. Such material shall be removed from the site.

2. The subgrade must slope at a minimum of two percent towards the bottom of slopes and subdrains. Subgrade levels shall be adjusted as required to ensure that all planting and lawn areas have adequate drainage.

F. Planting Soil Preparation: Refer to Section 329113, 2.01. Examine soil and remove foreign materials, stones and organic debris over 1/2" in size. Remove all vegetation from stockpiles prior to placement. Mix-in or apply fertilizers and amendments as required by testing laboratory and as approved by the Landscape Architect. All preparation and mixing shall be accomplished when the soil moisture content is compliant with Section 329113, 1.09 and at a moisture content approved by the Landscape Architect. If lime is to be added, it shall be mixed with dry soil before fertilizer is added.

3.03 BACKFILLING OF SOIL LAYERS

A. Subgrade preparation in areas of the site that are to be **filled** after being compacted due to construction activities such as, but not limited to, temporary parking areas, material stockpile areas, temporary roadways, construction areas and areas around structures and other similar areas.

1. Refer to C. below for Compaction Mitigation.

B. Soil Placement Preparation:

1. Verify that the subgrade preparations have been reviewed and accepted, including removal of all existing vegetation prior to placement of planting soils.

2. Notify the Landscape Architect of soil placement operations at least seven calendar days prior to the beginning of work.

C. Coordinate the following scarification work to eliminate subgrade compaction after the subgrade has been established.

1. Site Subgrade Compaction Mitigation for all general seeded areas:

a. Immediately prior to placing General Amended Lawn Topsoil, the entire subgrade shall be loosened to a minimum depth of 4-inches using the teeth of a backhoe or other suitable equipment.

D. Placement of Planting Topsoil:

1. After the subgrade soils have been loosened, re-compressed and inspected, place the Amended Lawn and Planting Soil and the Amended Athletic Field Topsoil by using a wide track bulldozer size D-5 or smaller or may be dumped and spread with the bucket of a backhoe from the edge of the loosened area. No rubber-tired equipment or heavy equipment except for a small bulldozer or low ground pressure equipment shall pass over the subsoils (subgrade) after they have been loosened and recompressed. If the Contractor plans to utilize such areas for any use of heavy equipment, this work should be carried out prior to beginning the process of loosening soils or filling in that area.

E. Depth of Unamended Topsoils for Seed Mix #1 Areas: (9) inch minimum depth

F. Amendments incorporation for topsoil:

1. After the topsoil has been spread and graded, apply soil amendments at the rate recommended in the topsoil analysis. Apply limestone at least 5 days prior to application of fertilizer. Apply commercial fertilizer within 10 days of seeding or sodding.

2. Thoroughly and evenly incorporate soil amendments into the soil to a depth of 4 inches by disking or other approved method. In areas inaccessible to power equipment, use hand tools. Off site mixing of soil amendments with topsoil is not acceptable unless approved in advance by Landscape Architect. After the incorporation of soil amendments into the soil, re-compact and fine grade the filed area to remove all ridges and depressions, and clear the surface of all stones one inch or more in diameter and other debris.

3. Seeding may be done immediately thereafter provided the bed has remained in a good friable condition and has not become muddy or hard. If it has become hard, till to a friable condition. Apply water to dry soil to a depth of 4 inches, 48 hours prior to seeding.

G. General:

1. In all cases, the soil being placed shall be in a dry to damp condition. No wet soils shall be placed. Soil moisture content must be compliant with Section 329113 1.09.B.

2. Planting Soils, shall never be moved or worked when wet or frozen.

3. After planting soil has been spread, it shall be carefully prepared by hand raking. Stones and debris over one inch in any direction shall be removed from the premises. Fine grade planting beds to a smooth even surface with loose uniformly fine texture. Remove ridges and fill depressions as required to meet finish grades. Limit fine grading to areas that can be planted immediately after grading. Maintain the finished surfaces at the grades shown and spread additional soil to correct settlement or erosion. Surface drainage shall be maintained. Soil shall be damp and free from frost during fine grading operations.

H. After the topsoil has been spread and graded, apply soil amendments, fertilizer and limestone at the rate recommended by the Soil Testing Laboratory. Apply limestone at least 5 days prior to application of fertilizer. Apply commercial fertilizer within 10 days of seeding or sodding.

I. Thoroughly and evenly incorporate soil amendments into the soil to a depth of 6 inches by disking or other approved method. In areas inaccessible to power equipment, use hand tools. Off-site mixing of soil amendments with topsoil is not acceptable unless approved in advance by Landscape Architect. After the incorporation of soil amendments into the soil, re-compact and fine grade the filed area to remove all ridges and depressions, and clear the surface of all stones one inch or more in diameter and other debris.

3.04 PROTECTION

A. The Contractor shall protect landscape work and materials from damage due to landscape operations, operations by other Contractors or trespassers. Maintain protection during installation until acceptance. Treat, repair or replace damaged Planting Soil installation work immediately.

B. Provide all means necessary, including fences, to protect all soil areas from compaction and contamination by trash, dust, debris, and any toxic material harmful to plants or humans after placement. Any area that becomes compacted, shall be de-compacted and tilled to the extent determined by the Landscape Architect and recompressed to the density ranges specified. Any uneven or settled areas shall be filled and re-graded. Soil that becomes contaminated shall be removed and replaced with specified soil material.

C. Phase the installation of the planting soil such that equipment does not have to travel over already installed planting soil.

D. Apply fabric coverings or other engineering controls over soil to protect placed soil in any area where the Contractor must work after the installation of Planting Soil.

3.05 FIELD QUALITY CONTROL

A. Tests: Right is reserved to take samples at any time of amended landscape soils and backfill mixes for testing for conformity to Specifications.

B. Rejected Materials: Remove and legally dispose off site at Contractor's cost. Pay cost of testing of materials, not meeting Specifications.

END OF SECTION

SECTION 329200

LAWNS AND GRASSES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. PART A and DIVISION 1 of PART B are hereby made a part of this SECTION.

B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this SECTION.

1.02 SCOPE OF WORK

A. Provide all labor, materials, equipment, services and transportation required to complete lawns and grasses as shown on the Drawings and as specified herein or both.

1.03 RELATED WORK

A. The following related work is to be performed under the designated Sections.

1. Site Preparation – Section 311000
2. Earthwork - Section 312000
3. Finish Grading - Section 312219
4. Soil Preparation - Section 329113

1.04 REFERENCES

A. Hortus III - 1976 Edition, Bailey Hortorium, Cornell University.

B. Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

C. Massachusetts Pesticide Control Act (MPCA, Chapter 132B of the Massachusetts General Laws). Chapter 333 of the Code of Massachusetts Regulations (333 CMR).

D. ASA: American Society of Agronomy.

E. Recommended Soil Testing Procedures for the Northeastern United States, 2nd Edition, Northeastern Regional Publication No. 493.

F. American Society for Material Testing (ASTM)

1.05 SUBMITTALS

A. Submit the following in accordance with the requirements of Section 013300 – Submittals.

B. Test Reports: Soil Test reports of Amended Lawn and Planting Topsoil and recommendations for amendments and the rate of application to be applied before or after the installation of Lawns and Grasses. Refer to Sections 329113 Soil Preparation.

1. Limestone
2. Fertilizer
3. Herbicides and Fungicides

C. Product Data:

1. Limestone
2. Fertilizer
3. Herbicides and Fungicides
4. Hydroseeding Mulch.
5. Hydroseeding Mulch mix ratios and amounts.
6. Seed Mix #1.
7. Protective Coverings.

D. Certificates:

1. Certificates of inspection as required by law for transportation of each shipment of seed along with invoice.
2. Seed mix certificate confirming the grasses and their minimum percent grass seed purity and germination (including incorporated top dress fertilizer and rate of application for hydroseeding).

1.06 DELIVERY, STORAGE, AND HANDLING

A. Seed:

1. Furnish all seed, hydroseeding mulch, fertilizer and other products in unopened manufacturer's standard containers bearing original certification labels showing quantity, analysis and name of manufacturer.
2. Protect seed from weather or other conditions that would damage or impair effectiveness of the product.

B. Hydroseeding Mulch:

1. Labeling: Each package of cellulose fiber shall be marked by the manufacturer to show the air-dry weight content.

2. Storage: Protect from weather or other conditions, which would damage or impair the effectiveness of the product.

1.07 CLIMATE RESTRICTIONS

A. Do not install lawns during rainy or freezing weather, or when soil is frozen.

1.08 TIMING OF INSTALLATION

A. Hydroseeded Lawns:

1. Hydroseeding shall be done within one (1) calendar days after the completion and acceptance of finish grading in any area.

2. Hydroseeding of Seed Mix #1:

Between April 15 - May 31 and

Between September 1 - October 1.

3. If special conditions exist which may warrant a variance in the above dates, a written request shall be submitted to the Landscape Architect stating the conditions and proposed variance. Permission for the variance shall be given if in the opinion of the Landscape Architect the variance is warranted.

1.09 SEQUENCE OF REVIEW, MAINTENANCE, ACCEPTANCE AND WARRANTY

A. Coverage: Warrant growth and coverage of lawns and grasses areas shall be covered with vigorous well established seed, weed free with no bare spots.

B. Exceptions: Sub-Contractor shall not be held responsible for failures due to damage by Owner, vandalism, or Acts of God during Warranty Period. Report such conditions in writing.

1.10 INSPECTIONS

A. Landscape Architect reserves the right to inspect seed mixes and the hydroseed accessories upon delivery to the site and to reject any or all of the shipment if it does not meet his satisfaction.

1.11 DEFINITIONS

A. References to Landscape Architect shall mean Architect or the Architect's designated representative.

PART 2 PRODUCTS

2.01 SEED MIXES:

A. Seed Mix Uses: Use where shown on the Drawings.

B. Seed Composition: Use only fresh, clean, certified, new crop seed of the following varieties mixed in the following proportions:

C. Seed Mix #1 –New England Conservation/Wildlife Mix available from New England Wetland Plants, 413-548-8000.

1. Application Rate: 30 lbs. per acre.

2.02 SEEDING ACCESSORIES

A. Water: Potable water. Transport as required.

B. Hydroseeding Mulch:

1. Composition: Green-colored, fibrous, 100% virgin wood fiber mulch containing no growth or germination-inhibiting factors.
2. Product: “EcoFibre” Premium Wood Fiber Mulch by Profile Products LLC www.profileproducts.com, or "Conwed Fibers Hydro Mulch 2000" with tackifier by Conwed Corporation www.conwedfibers.com.

C. Hydroseeding Soil Stabilizer:

1. Composition: Totally organic substance, supplied in powder form and at least 90% of which is 92% pure muciloid derived from ground Plantago ovata-insularis husks. Stabilizer shall be water-soluble, non-toxic hydrophilic and shall not inhibit germination.
2. Product: “FlocLoc Pro Plus” by Profile Products LLC www.profileproducts.com.

2.03 HYDROSEEDING EQUIPMENT

A. Type: Commercial hydro-seeder with built-in agitation system and an operating capacity sufficient to agitate, suspend and homogeneously mix slurry.

B. Distribution Lines: Sufficient to prevent stoppage and provide even distribution of the slurry over the ground.

C. Pump Capacity: 150 minimum psi at the nozzle.

D. Slurry Tank: 1,000 gallons minimum capacity.

2.04 PROTECTIVE COVERINGS

A. Product: Refer to Section 312500 – Erosion Control.

PART 3 EXECUTION

3.01 EXAMINATION FOR LAWN INSTALLATION

A. Verification of Conditions:

1. Grades: Verify that grades are within (1) inch plus or minus of the required finished grades. Verify that all soil preparation has been completed and approved. Report all variations in writing.
2. Soil Preparation Work: Verify that all fertilization amending and scarification specified in Section 329113 has been completed before any seeding work in Lawn Areas shall be done.

3.02 PREPARATION

A. The seed bed shall be raked either by power rake or by hand to produce a loose friable seed bed.

B. Stones, Weeds, Debris: Verify that all areas to receive lawns grasses are clear of stones larger than (1/2) inch in any dimension, weeds, debris and other extraneous materials shall be removed.

1. Remove and legally dispose any of these materials at no additional cost to the Owner.

C. Excessive Soil Moisture: Do not commence work of this Section when soil moisture content is so great that excessive compaction will occur.

D. Inadequate Soil Moisture: Apply water, as necessary, to bring soil to an optimum moisture content for planting. Do not work soil when it is so dry that dust will form in air or that clods will not break readily.

E. Care shall be taken that no lime, fertilizer, hydroseed mulch or seed mix comes in contact with the adjacent planting areas.

3.03 SEED INSTALLATION

A. Areas for Lawn Seed are designated and shall be where located on the Drawings and are listed below:

1. Seed Mix #1: These mixes shall be hydroseeded.

B. Hydroseeding Preparation: Do all slurry preparation at the job site.

1. Do not dry mix seed or agitation will damage the seed.

2. Blend the water, Seed mixtures or meadow grass mixtures, hydroseeding soil stabilizer and hydroseed mulch into the hydroseeding machine according to the machine's mix schedule and component manufacturer's directions.

3. Commence spraying immediately when the tank is full.

C. Hydroseeding Spraying Application:

1. General: Apply specified slurry mix in a sweeping motion to form a uniform mat at the specified rate. Keep hydroseeding within designated areas and keep from contact with other plant materials.

2. Unused Mix: Do not use any slurry mixture that has not been applied within four (4) hours of mixing. Promptly remove from the site.

3. Protection: After application, do not operate any equipment over the hydroseeded areas.

4. Reseeding: Reseed all areas and parts of areas that fail to show a uniform stand until all areas comply with the specified Warranty.

D. Watering for Hydroseeded Lawns and Grass Mixes

1. Watering shall be done again within 72 hours of installations or earlier if conditions require.

a. Watering shall be done with a fine spray until the seed bed is moistened to a depth of (1/2) inches. Do not use a jet nozzle or permit disturbance of the seed bed or flood adjacent areas.

2. Rejected Materials: Remove rejected materials immediately from the site at Sub-Contractor's expense. Pay cost of testing of materials not meeting Specifications.

3.04 PROTECTIVE COVERINGS

A. Install jute mesh as specified in Section 312500 – Erosion and Sedimentation Control on slopes 3:1 or greater.

3.05 MAINTENANCE AND PROTECTION

A. Maintenance shall begin immediately after the material is installed.

3.06 FIELD QUALITY CONTROL

A. Tests: Samples of materials may be taken and tested for conformity to Specifications at any time.

3.07 CLEANING

A. Erosion: Immediately restore eroded areas. Keep all adjacent paved surfaces cleaned of dirt, mud or stains and organic debris.

B. Over - Sprayed Hydroseed Mix: Immediately clean over - sprayed hydroseed mix from any surface other than lawn.

END OF SECTION