

**TOWN OF PLYMOUTH
PROCUREMENT DIVISION
11 LINCOLN STREET
PLYMOUTH, MASSACHUSETTS 02360**



BID 21611, JOSEPH SIMES HOUSE RENOVATIONS, PHASE 2

Issued:	June 29, 2016
Pre-Bid:	July 7, 2016, at 11:00 a.m.
Sub-Bids Due:	July 18, 2016, at 11:00 a.m.
General Bids Due:	August 8, 2016, at 11:00 a.m.

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END OF SECTION

SECTION 00020

INVITATION TO BID

Sealed general bids and filed sub-bids are sought by the Town of Plymouth for **renovations to the Joseph Simes house, including the selective demolition of the existing one story ell, associated site work, site utilities, construction of a new three-story stair and elevator addition, construction of handicapped ramp, installation of new finishes, mechanical systems, electrical systems, plumbing systems, and misc. items.**

Specifications and bid forms are available electronically by registering at <http://www.plymouth-ma.gov/current-bids> or in the Procurement Office, 11 Lincoln St, Plymouth, MA, 02360 for a refundable deposit of \$200.00 per set and non-refundable mailing fee of \$100.00 or pre-paid shipping voucher. The office hours are M-F 7:30 am-4:00 pm. Call first for availability at 508-747-1620 x210. General Bidders and Filed Sub-Bidders must be certified by the Division of Capital Asset Management and Maintenance in their respective category of work.

Any persons interested in submitting a bid are encouraged to attend a pre-bid site visit on Thursday, July 7th at 11:00 a.m. at 29 Manomet Point Road, Plymouth, Massachusetts, 20360.

Sealed filed sub-bids for the sub-trades indicated in the Instructions for Bidders shall be filed at the Procurement Office before **11:00 a.m. on Monday, July 18, 2016**, at which time they will be publicly opened and read aloud. All sub-bids must be sealed and made upon forms furnished by the Procurement Division and contained in the bid documents. Sub-bids submitted on any other form will not be accepted. Envelopes must be clearly marked "Sub-bid for _____ Sub-Trade for Simes House Renovations," along with the name and address of the sub-bidder. If mailed, the sealed envelope containing the sub-bid must, in turn, be enclosed in a second sealed envelope.

Sealed general bids shall be filed at the Procurement Office before **11:00 a.m., Monday, August 8, 2016**, at which time they will be publicly opened and read. All bids must be sealed and made upon forms furnished by the Procurement Division and contained in the bid documents. Bids submitted on any other form will not be accepted as valid bids. Envelopes should be clearly marked "Bid for Simes House Renovations," along with the name and address of the bidder." If mailed, the sealed envelope containing the bid must, in turn, be enclosed in a second sealed envelope.

General bids and sub-bids for this project are subject to the provisions of Massachusetts General Laws (MGL) Chapter 149, Sections 44A-44M, as amended.

Each general bid and sub-bid must be accompanied by a bid deposit in the amount of 5% of the total amount of the bid, including any alternates. Such deposit shall be in the form of a certified, treasurer's or cashier's check made payable to the Town of Plymouth or a bid bond in a form satisfactory to the Town of Plymouth with a surety company qualified to do business in the Commonwealth of Massachusetts and satisfactory to the Town, with such bond conditioned upon faithful performance by the principal of the agreements contained in the bid. Return of bid deposits will be in accordance with the provisions of the applicable General Laws. All bid bonds shall be retained by the Town of Plymouth unless accompanied by a stamped, self-addressed envelope for the return of the bond.

A performance bond in an amount equal to 100 percent of the total amount of the bid with a surety company qualified to do business in the Commonwealth of Massachusetts will be required of the successful general bidder for the faithful performance of the contract, as well as a labor and materials bond in an amount equal to 100 percent of the total bid amount. These bonds shall be submitted by the successful general bidder following award of a contract.

The filed sub-bidders named in the general bid of the successful general bidder shall provide a 100 percent payment bond and 100 percent performance bond to such general bidder **if and only if** (i) such sub-bidders are requested so to do in the general bid by the general bidder, who shall pay the premiums therefor, or (ii) prequalification is required pursuant to Section 44D3/4 of Chapter 149 of the General Laws.

Attention is directed to the minimum wage rates to be paid as determined by the Commissioner of Labor and Industries under the provisions of Massachusetts General Laws, Chapter 149, Section 26 and 27D inclusive. These rates shall be updated annually. No adjustments in compensation shall be permitted as a result of any changes in applicable rates.

All bids for this project are subject to applicable public bidding laws of Massachusetts, including G.L. c.30, Section 39M, as amended, and G.L. c.149, Sections 44A through 44M, as amended.

Selection of the contractor will be based upon, among other appropriate considerations, bidder qualifications, including evidence of past performance in similar projects, and bid price. **The contract will be awarded, if at all, to the bidder deemed by the awarding authority to be the lowest responsible and eligible bidder.**

The awarding authority is the Town of Plymouth, acting by its Town Manager, who reserves all rights as to treatment of bids, including the right to waive any informalities in, or reject any and all, bids if deemed to be in the best interests of the Town.

The bidders agrees that their bids/sub-bids shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids.

SECTION 00100

INSTRUCTIONS TO BIDDERS

1. Receipt and Opening of Bids/Sub-bids

The Town of Plymouth, herein called the "Owner" or "Town," acting by and through its Town Manager, will receive sealed bids for the Plymouth remediation project, filed in duplicate in the Procurement Division, Town Office Building, 11 Lincoln Street, Plymouth, Massachusetts, 02360.

Sealed filed sub-bids for the sub-trades indicated in the Instructions for Bidders shall be filed at the Procurement Office before **11:00 a.m.** on **Monday, July 18, 2016**, at which time they will be publicly opened and read aloud. All sub-bids must be sealed and made upon forms furnished by the Procurement Division and contained in the bid documents. Sub-bids submitted on any other form will not be accepted. Envelopes must be clearly marked "Sub-bid for _____ Sub-Trade for Simes House Renovations," along with the name and address of the sub-bidder. If mailed, the sealed envelope containing the sub-bid must, in turn, be enclosed in a second sealed envelope.

A list of the sub-bids received for each sub-trade, together with the names, addresses and sub-bid prices of the sub-bidders, shall be delivered, via addendum, to all general bidders no later than two days (Saturdays, Sundays and legal holidays excluded) before the date fixed for the receipt of general bids.

Filed sub-bids for the following sub-trades are being solicited:

1. Lathe & Plaster
2. Painting
3. Plumbing
4. Mechanical
5. Electrical
6. Elevator
7. Fire Protection

Sealed general bids shall be filed at the Procurement Office before **11:00 a.m., Monday, August 8, 2016**, at which time they will be publicly opened and read. All bids must be sealed and made upon forms furnished by the Procurement Division and contained in the bid documents. Bids submitted on any other form will not be accepted as valid bids. Envelopes should be clearly marked "Bid for Simes House Renovations," along with the name and address of the bidder." If mailed, the sealed envelope containing the bid must, in turn, be enclosed in a second sealed envelope.

Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified will not be considered. Each bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 days, Saturdays, Sundays, and legal holidays excluded, after the opening of

bids.

2. Location and Work to be Done

The work consists of selective demolition of the existing one story ell , associated site work, site utilities, construction of a new three-story stair and elevator addition, construction of handicapped ramp, installation of new finishes, mechanical systems, electrical systems, plumbing systems, and misc. items. The work is more specifically described in the attached contract specifications.

The successful general Contractor shall furnish all labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies, and all other things necessary to do all work required for the completion of each item of the Work and as herein specified.

The Work to be done and paid for under any item shall not be limited to the exact extent mentioned or described but shall include all incidental work necessary or customarily done for the completion of that item.

3. Preparation of Bid/Sub-bid

Each bid must be submitted in duplicate on the prescribed forms. All blank spaces for bid prices must filled in, in ink or typewritten, in both words and figures.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and endorsed with the name of the project as specified in Receipt and Opening of Bids, above.

If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in Receipt and Opening of Bids, above.

4. Bid/Sub-bid Opening Procedure

The following list of requirements shall apply to each filed bid. Bids not meeting all the requirements for timeliness and bid security will be rejected; bids not meeting statutory requirements of substance will be rejected.

Bids shall be filed at the place and before the time specified in Receipt and Opening of Bids, above.

Properly executed bid deposits shall be included in the bid envelope.

Bid signatures will be checked.

All addenda will be faxed and/or emailed and/or mailed to all prospective bidders and the last of which will be mailed not later than five days prior to the date established for submission of bids. All bidders shall include with their bids the written acknowledgement form provided in Section 00300, FORM OF GENERAL BID. Nevertheless, each bidder shall be responsible to ensure and confirm that it has received all addenda.

At the opening of bids, the total dollar amount of each bid will be read, and the three apparent lowest bids will be selected for further consideration. These three apparent low bids will be read aloud for the benefit of the other bidders, if desired, and the bid opening procedure will be closed. All those present at the bid opening may examine all bids after the bid opening and after the reading of the three apparent low bids, provided, however, that "DCAMM Update Statements" shall not be available for review in accordance with applicable law.

The following documents are to be submitted with all bids and sub-bids. Failure to make any of the following submissions may render the bid unacceptable:

- a. bid form (sub-bid form for sub-bidders)
- b. bid deposit
- c. Signed Delegation of Authority (page 25)
- d. DCAMM Certificate of Eligibility
- e. DCAMM Update Statement
- f. List of equipment and manpower

5. Withdrawal of Bids

Except as hereinafter expressed provided, once a bid is submitted and received by the town, the bidder agrees that he may not and will not withdraw it within thirty (30) days (Saturdays, Sundays, and legal holidays excluded) after the actual date of the opening of proposals.

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

- a. at any time prior to the designated time for the opening of bids;
- b. after the designated time for the opening of bids, a bid may be withdrawn only (i) after a contract has been signed by the successful general bidder and Owner, and such bidder has furnished all required bonds, or (ii) if the bidder's bid was not selected by the Town (or, for filed sub-bidders, if the sub-bidder was not the selected general bidder) after expiration of 30 days (Saturdays, Sundays and legal holidays excluded), whichever is earlier. Otherwise, a bidder withdrawing its bid after such designated time shall forfeit its bid deposit, except as provided by G.L. c. 149, § 44B(3), which allows withdrawal in the case of death, disability, bona fide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the bidder.

Unless a bid is withdrawn as provided above, the bidder agrees that it shall be deemed open for acceptance until a contract has been executed by the Town and successful bidder and such bidder has furnished all required bonds, or until the Town notifies the bidder in writing that his bid is rejected, or that the Town does not intend to accept it, or returns his bid surety. Notice of acceptance of a bid shall not constitute rejection of any other bid.

6. Ability and Experience of Bidder

No award will be made to any bidder who cannot satisfy the Owner that he has sufficient

ability and experience in the applicable class(es) of work and sufficient capital and plant to enable him to prosecute and complete the work successfully within the time named. The Owner's decision or judgment on these matters will be final, conclusive, and binding.

General bidders will be deemed "responsible and eligible" if they meet the following criteria, among any other criteria required by law:

a. The Bidder shall submit a list of at least five (5) references on similar projects, for property listed on the National Register of Historic Places, the Massachusetts State Register of Historic Places, or other similar historic property. Project description, dates, costs, and contact information for each reference are required;

b. The Bidder must have sufficient equipment (both in number and capability) and manpower to complete the project no later than **240 calendar days** from the date of Contract Execution, and must submit a listing of equipment and manpower available for the Project to substantiate this claim.

The Owner may make such investigations as he deems necessary, and the bidder shall furnish to the Owner, under oath if so required, all such information and data for this purpose as the Owner may request.

7. Conditions of Work

Each bidder must familiarize himself fully with the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible the Contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor whom the Town may, in its discretion, employ at the site.

8. Addenda and Interpretations

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally, and if any oral interpretations are provided, no bidder may rely upon them. All information given to bidders other than by means of the plans, specifications, or by addenda, as described below, is given informally and shall not be used as the basis of a claim against the Owner. Questions related to the bid process can be addressed to Pamela D. Hagler, Procurement Officer, at 508-747-1620 ext. 210.

Every request for such interpretation must be in writing, addressed to the **Owner** and faxed to the Procurement Officer at 508-830-4133 or emailed, phagler@townhall.plymouth.ma.us. To be given consideration, each written request must be received at least five (5) days prior to the date fixed for the opening of bids. Any and all interpretations and any supplemental instructions given by the Town will be in the form of written addenda to the bid documents, plans and specifications. When issued, addenda will be distributed to all prospective bidders (at the respective address furnished by them for such purposes). Failure of any bidder to receive any such addenda shall not relieve such bidder from any obligation under his bid as submitted. It shall be the sole responsibility of a bidder to confirm that it has received any and all addenda. All addenda so issued shall become part of the Contract

Documents.

9. Security for Faithful Performance

Simultaneously with his delivery of the executed Contract, the general Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor and materials under this contract, as specified in the Invitation to Bid. The surety on such bond or bonds shall be a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Owner. The bonds shall remain in force for one year after final acceptance of the work by the Owner, unless the Owner, in writing, releases the Contractor from the obligation sooner.

The filed sub-bidders named in the general bid of the successful general bidder shall also provide a 100 percent payment bond and 100 percent performance bond to such general bidder if and only if (i) such sub-bidders are requested so to do in the general bid by the general bidder, who shall pay the premiums therefor, or (ii) prequalification is required pursuant to Section 44D3/4 of Chapter 149 of the General Laws.

10. 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.

11. Laws and Regulations

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full. Attention is directed to Section 00850 and to other applicable sections of the specifications.

12. Liquidated Damages for Failure to Enter into Contract

The successful general bidder, upon his failure or refusal to execute and deliver the Contract and bonds required within 10 days after he/she has received notice of the acceptance of his/her bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, of the bid security deposited with his/her bid, but the amount forfeited shall not exceed the difference between his/her bid price and the bid price of the next lowest responsible and eligible bidder. In case of death, disability, bona fide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the bidder (as stated in G.L. c. 149, § 44B(3)), his/her bid deposit will be returned.

Any filed sub-bidder who fails or refuses to execute and deliver a subcontract and bonds, if any, with/to the general bidder shall similarly forfeit its bid deposit to the Owner.

13. Obligation of Bidder/Sub-bidder

At the time of the opening of bids each bidder will be presumed to have inspected the site and to have closely examined, and to be thoroughly familiar with, the Contract Documents

(including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve any bidder from any obligation with respect to his bid.

14. Information Not Guaranteed

All information, if any, given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is furnished only for the information and convenience of bidders and is not guaranteed. If a bidder has reason to question the accuracy of any such information, it must notify Owner in writing before submitting its bid, failing which the bidder shall, if awarded a contract, be responsible for all consequences arising from such inaccuracy.

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.

If is further agreed and understood that no bidder or Contractor shall 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 or the Designer, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents or G.L. c. 30, § 39N.

15. Bid Security

Each bid and filed sub-bid must be accompanied by a certified check, a bid bond, a treasurer's or cashier's check, payable to the Owner, in the amount five percent (5%) of the total amount of the bid, including any and all alternates. Such deposits will be returned to all within five days after the opening of general bids (Saturdays, Sundays, and legal holidays excluded), except for the deposits of the three lowest responsible and eligible general bidders and the filed sub-bidders named in their general bids, and of the three lowest responsible and eligible sub-bidders in each sub-trade. The remaining deposits will be returned after the Owner and the accepted general bidder have executed the Contract and such bidder has furnished all required bonds, or if no award of contract has been made within 30 days, Saturdays, Sundays and holidays excluded, after the date of the opening of bids, upon demand of the bidder at any time thereafter.

16. Right to Reject Bids/Sub-bids

The Owner reserves the right to waive any informalities or reject any and all bids, should the Owner deem it to be in the public interest to do so, and to take any and all other actions with respect to general bids and filed sub-bids as are permitted by law. Bids unaccompanied by a bid security shall be rejected.

The Owner may also reject bids which in its sole judgment do not conform to G.L. c. 149, §§ 44A-44H, or which are incomplete, conditional, obscure, or not responsive, or which are on a form not completely filled in, or contain additions not called for, or for other reasons

allowed by law.

17. Time for Commencement and Completion

The successful bidder must agree to commence work within ten (10) days of the date of its receipt of the Notice to Proceed and to fully complete the project by the date listed in the Notice to Proceed, or if there is no date in the Notice to Proceed, within the time stated in the contract documents.

18. Comparison of Bids

Bids will be compared on the basis of the total bid price as set forth in the bid forms.

In the event that there is a discrepancy in Section 00300, FORM OF GENERAL BID between the lump sum or unit prices written in words and figures, the prices that are the lowest, whether in written in words or figures, will govern.

19. Award of Contract

The Contract will be awarded, if at all, to "the lowest responsible and eligible bidder" pursuant to and as defined in General Laws Chapter 149, Section 44A, as amended. Such a bidder shall possess the skill, ability and integrity necessary for the faithful performance of the work, shall be able to furnish labor that can work in harmony with all other elements of labor employed, or to be employed, in the work, and shall be able to certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and shall otherwise comply with all applicable provisions of law.

20. Statutes Regulating Competitive Bidding

Any bid which does not comply with the provisions of Massachusetts General Laws, Chapter 149, Sections 44A through 44M, as amended, need not be accepted and the Owner may reject every such bid.

21. Certificate of Eligibility and Update Statement

In accordance with Massachusetts General Laws Chapter 149, Paragraph 44D, every bid and every sub-bid must be accompanied by a copy of a Certificate of Eligibility issued by the Division of Capital Asset Management and Maintenance (DCAMM) showing that the bidder has the classification and capacity rating to perform the work required, and a DCAMM Update Statement.

22. Wage Rates

Prevailing Wage Rates as determined by the Commissioner of Department of Labor and Industries under the provision of the Massachusetts General Laws, Chapter 149, Section 26 to 27G, as amended, apply to this project. It is the responsibility of the contractor, before bid

opening, to request if necessary, any additional information on Prevailing Wage Rates for those tradespeople who may be employed for the proposed work under this contract.

State schedules of Prevailing wage rates are included in the bid/contract documents.

Wage rates will be updated annually. Bidders shall not be entitled to any additional compensation on account of any adjustments or changes in wage rates.

23. Contractor Records

The Contractor shall comply with the applicable provisions of Massachusetts General Laws, Chapter 149, Section 39R, concerning Contractor records.

24. Insurance

The Contractor shall carry and continuously maintain until completion of the Contract, insurance as specified in the Supplemental General Conditions and in such form as shall protect him performing work covered by this Contract, or the Town and its employees, agents and officials, from all claims an 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, in addition to and not in limitation of any other rights and remedies available to the Town, to hold the Town and its employees, agents and officials harmless from loss or damage due to claims for personal injury (including death) and/or property damage arising from, or in connection with operations under this Contract.

25. Safety and Health Regulations

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 (PS-91-596) and under Section 107 of the Contract Work Hours and Safety Standards Acts (PL-91-54).

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 within the regulations of the Act.

This project is subject to the Safety and Health Regulations of the U.S. Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (Industrial Bulletin No. 12)." Contractors shall know the requirements of these regulations.

26. Right to Know Law (G.L. c. 111F)

To the fullest extent required by law, the successful bidder/sub-bidders shall comply with G.L. c. 111F, the Massachusetts Right to Know Law.

FAILURE TO COMPLY WITH THESE REQUIREMENTS, TO THE EXTENT APPLICABLE, COULD RESULT IN THE REJECTION OF YOUR BID OR THE

CANCELLATION OF YOUR CONTRACT.

27. Affirmative Action/Equal Employment Opportunity Laws and Regulations

The Town of Plymouth is an affirmative action/equal opportunity owner/purchaser. The bidder's attention is directed to all applicable State Laws, Town Bylaws, and rules and regulations regarding affirmative action/equal employment opportunity requirements. Failure of a bidder to comply with any such law, bylaw, rule or regulation shall constitute grounds for the Town to reject a bid or to otherwise reject or terminate the award of the contract pursuant to these contract documents.

NAME OF BIDDER _____

SECTION 00300

FORM FOR GENERAL BID

To the Awarding Authority:

A. The Undersigned proposes to furnish all labor and materials required for **Renovations to the Joseph Simes House** in accordance with the accompanying plans and specifications prepared by **Red Hawk Studio Architects, Inc.** for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. Bidder acknowledges receipt of the following addenda, which are included in this bid:

No. _____ Dated: _____

No. _____ Dated: _____

No. _____ Dated: _____

C. The Bidder agrees to perform the work described in the specifications and shown on the plans for the following contract price:

\$ _____

(Amount shall be in both words and figures. In case of discrepancy, the lowest amount will govern.)

Item	Description	Unit	Estimated Quantity	Bid Unit Price in Figures	Bid Price in Figures
No.	Bid Unit Price in Words	Unit	Estimated Quantity	Bid Unit Price in Figures	Bid Price in Figures
1	Replacement of Existing Piers _____ dollars and _____ cents	PER PIER	0-6		

ALTERNATE: For the following alternate, add as shown below.

1. Additional Stop to LULA Elevator \$ _____

D. The subdivision of the proposed contract price is as follows:

Item 1. The work of the general contractor, being all work other than that covered by Item 2.

\$ _____

Item 2. The sub-bid is as follows:

Sub-Trade	Name of Sub-Bidder	Amount	Bonds Required (yes/no)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Total of Item 2 _____

The undersigned agrees that the above named sub-bidder will be used for the work indicated at the amount stated, unless a substitution is made. The undersigned further agrees to pay the premiums for the performance and payment bonds furnished by sub-bidders as requested herein and that all of the cost of all such premiums is included in the amount set forth in Item 1 of this bid.

The undersigned agrees that if he is selected as general contractor, he will promptly confer with the awarding authority on the question of sub-bidders; and that the awarding authority may substitute for any sub-bid listed above a sub-bid filed with the awarding authority by another sub-bidder for the sub-trade against whose standing and ability the undersigned makes no objection; and that the undersigned will use all such finally selected sub-bidders at the amounts named in their respective sub-bids and be in every way as responsible for them and their work as if they had been originally named in this general bid, the total contract price being adjusted to conform thereto.

E. The undersigned agrees that, if he is selected as general contractor, he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price; provided, however, that if there is more than one surety, the surety companies shall be jointly and severally liable.

The undersigned hereby certifies that the Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and

health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to G.L. c.149, §44A.

The undersigned further certifies under the 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 subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

The undersigned further certifies under the penalties of perjury that the Contracting Party has complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support in accordance with MGL Chapter 62C, Section 49A.

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

BIDDER _____

AUTHORIZED SIGNATURE

COUNTY _____

Printed Name and Title

PHONE _____

Date Offered

FAX _____

TAX I.D. NUMBER _____

STATE OF INCORPORATION _____

NAME OF BIDDER

SECTION 00400

FORM FOR SUB-BID

To all General Bidders Except those Excluded:

A. The undersigned proposes to furnish all labor and materials required for completing, in accordance with the hereinafter described plans, specifications and addenda, all the work specified in Section No. _____ of the specifications and in any plans specified in such section, prepared by Red Hawk Studio Architects, Inc. for Renovations to the Joseph Simes House project in Plymouth, Massachusetts, for the contract sum of

_____ dollars (\$ _____).

For Alt. 1. Additional Stop for LULA Elevator \$ _____ (Add)

B. This sub-bid includes addenda numbered _____

C. This sub-bid

___ may be used by any general bidder except:

___ may only be used by the following general bidders:

[To exclude general bidders, insert "X" in one box only and fill in blank following that box. Do not answer C if no general bidders are excluded.]

D. The undersigned agrees that, if he is selected as a sub-bidder, he will, within 5 days, Saturdays, Sundays and legal holidays excluded, after presentation of a subcontract by the general bidder selected as the general contractor, execute with such general bidder a subcontract in accordance with the terms of this sub-bid, and contingent upon the execution of the general contract, and, if requested so to do in the general bid by the general bidder, who shall pay the premiums therefor, or if prequalification is required pursuant to section 44D3/4, furnish a performance and payment bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority, in the full sum of the subcontract price.

E. The names of all persons, firms and corporations furnishing to the undersigned labor or labor and materials for the class or classes or part thereof of work for which the provisions of the section of the specifications for this sub-trade require a listing in this paragraph, including the undersigned if customarily furnished by persons on his own payroll and in the absence of a contrary provision in the specifications, the name of each such class of work or part thereto and

the bid price for such class of work or part thereof are:

Name Class of Work Bid price

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

[Do not give bid price for any class or part thereof furnished by undersigned.]

F. The undersigned agrees that the above list of bids to the undersigned represents bona fide bids based on the hereinbefore described plans, specifications and addenda and that, if the undersigned is awarded the contract, they will be used for the work indicated at the amounts stated, if satisfactory to the awarding authority.

G. The undersigned further agrees to be bound to the general contractor by the terms of the hereinbefore described plans, specifications, including all general conditions stated therein, and addenda, and to assume toward him all the obligations and responsibilities that he, by those documents, assumes toward the owner.

H. The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all the requirements of the plans and specifications:--

1. Have been in business under present business name _____ years.
2. Ever failed to complete any work awarded? _____
3. List one or more recent buildings with names of the general contractor and architect on which you served as a sub-contractor for work of similar character as required for the above-named building.

Building Architect General Contractor Amount of Contract

- (a) _____
- (b) _____
- (c) _____

4. Bank reference _____

I. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F.

The undersigned further certifies under penalties of perjury that this sub-bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this

subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

BIDDER _____

AUTHORIZED SIGNATURE

Printed Name and Title

COUNTY _____

PHONE _____

Date Offered

FAX _____

TAX I.D. NUMBER _____

STATE OF INCORPORATION _____

SECTION 00500

AGREEMENT

THIS AGREEMENT, made this the _____ day of _____, 2016, by and between the TOWN OF PLYMOUTH, with an office at 11 Lincoln Street, Plymouth, Plymouth County, Massachusetts, 02306, hereinafter called the "OWNER," acting herein through its Town Manager, and _____, a _____ corporation, with an office at _____ hereinafter called "CONTRACTOR."

WITNESSETH, that the Owner and the Contractor, for the consideration hereafter named, agree as follows:

Article 1. SCOPE OF WORK: The Contractor shall perform all the Work required by and reasonably inferable from the Contract Documents for the Renovations to the Joseph Simes House project.

Article 2. TIME OF COMPLETION: The Contractor shall commence work under this Contract on the date specified in the written "Notice to Proceed" from the Town and shall bring the work to Complete Completion on completion date. In the event Contractor fails to substantially complete all work within the time stated herein, Contractor shall pay to the Town \$1,000 for each day after such time during which the work is not substantially complete, the parties hereby agreeing that such amount is not a penalty but a reasonable estimate of the damages to the Town as a result of such delay. Notwithstanding anything to the contrary in the Contract Documents, the Town may, in its sole discretion, seek to recover actual damages in lieu of liquidated damages.

Article 3. THE CONTRACT SUM: The Town shall pay the Contractor in current funds for the performance of the Work, subject to additions and deductions by Change Order, the Contract sum of \$ (amount).

Article 4. THE CONTRACT DOCUMENTS: This Agreement, together with all the other documents enumerated in Article 1 of the General Conditions, all of which are incorporated herein by reference, shall constitute the Contract Documents to which Contractor is bound. Each Contract Document is complementary, and what is required by one shall be deemed required by all. In the event of any conflict among the provisions of the Contract Documents, the provisions requiring the greater quantity and better quality of goods and services shall control, as reasonably determined by the Owner.

Article 5. INDEMNIFICATION: The following obligation of Contractor shall be in addition to and not in limitation of any other right and remedy available to Owner.

To the fullest extent permitted by law, CONTRACTOR shall defend, indemnify, and hold harmless OWNER and its consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of designers,

architects, project managers, attorneys and other professionals and court and arbitration costs) arising out of or resulting from performance of the Work and is caused in whole or in part, directly or indirectly, by any act or omission of CONTRACTOR, any subcontractor, any person or organization directly or indirectly employed by any of them, or any person for whom either is responsible regardless of whether or not any such damage is caused in part by a party indemnified hereunder or arises by or is imposed by law or regulation.

In any and all claims against OWNER or any of its consultants, agents or employees by any employee of CONTRACTOR, and subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under the above paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such subcontractor or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefits acts.

Terms used in this Agreement which are defined in the Conditions of the Contract, shall have the meanings designated in those Conditions.

The CONTRACTOR agrees not to discriminate against or exclude any person from participation herein on grounds of race, religion, color, sex, age or national origin; and that it shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, religion, color, sex, age, handicapped status, or national origin.

The CONTRACTOR agrees not to participate in or cooperate with an international boycott, as defined in Section 999 (b)(3) and (4) of the Internal Revenue Code of 1954, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws.

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CONTRACTUAL LIABILITY

To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify, and hold harmless OWNER and its consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of designers, architects, attorneys and other professionals and court and arbitration costs) arising out of or resulting from performance of the Work, provided that any such claim, damage, loss or expense(s) 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 (b) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work 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 or arises by or is imposed by Law and Regulations regardless of the negligence of any such party.

In any and all claims against OWNER or any of its consultants, agents or employees by any employee of CONTRACTOR, and subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under the above paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such subcontractor or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefits acts.

Policies for General Liability, Automobile Liability, Workers' Compensation Insurance, and Umbrella Liability shall remain in effect during the one year correction period.

Such insurance as is herein certified applies to all operations of the insured in connection with, and necessary and incidental to, the work herein described at the locations stated.

It is hereby understood and agreed that the above policies will not be restrictively amended, materially changed nor canceled without 30 days advance notice by registered mail to OWNER.

Authorized Representative Signature
(Include Evidence of Authorization)

Address

DELEGATION OF AUTHORITY

At a meeting of the Board of Directors of the _____
(Name of Corporation)

duly called and held on _____ at which a quorum was present, and acting
(Date)

throughout, the following vote was duly adopted: VOTED: That
_____ the _____
(Name of Individual) (Title)

of the Corporation, hereby is authorized to affix the Corporate Seal, sign and deliver in the name and on behalf of the Corporation, bids, proposals, contracts, bills of sale, conditional sale agreements, chattel mortgages, leases, bonds, applications, affidavits, certificates, and any other similar documents required in connection with the sale of the Corporation's products to any purchaser, including assignments and satisfactions of any such documents.

Any and all applications, affidavits, statements, certificates, and similar documents required by law in connection with the licensing of the Corporation or its representatives for the sale, distribution, and servicing of its commercial products.

The authority is hereby delegated and shall be exercised by the aforesaid person in connection with the duties as

_____ of _____
(Title) (Name of Corporation)

and not otherwise.

ATTEST: _____ DATE: _____

NOTE: This form must be completed if the contractor is a corporation.

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 Town of _____,
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 _____, 2016, for the construction described as
follows:

JOSEPH SIMES HOUSE RENOVATION PROJECT

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
any provision thereof, 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. Surety hereby

agrees that the Owner need not terminate the Construction Contract to declare a Contractor Default or to invoke its rights under this Bond or as a condition of the Surety's fulfillment of its obligations hereunder.

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 promptly 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 reasonably decide, for all costs and expenses incurred by the Owner in performing and completing the work of the Construction Contract. Surety will keep Owner reasonably informed in writing of the progress, status and results of any investigation of any claim of the Owner under the Performance Bond.

If the Surety does not proceed strictly as provided in this Bond and with reasonable diligence, the Surety shall be deemed to be in default of this Bond, and the Owner shall be entitled to enforce any and all remedies 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; (4) indemnification obligations of the Principal, if any, as provided in the Construction Contract; and (5) liquidated damages as provided in the Construction Contract, or if no such damages are specified, actual damages and consequential damages resulting from the Contractor Default or any 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 _____, 2016.

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)

Witness as to Surety (SEAL)

(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
(City)

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 Town of Plymouth, 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 _____, 2016, a copy of which is hereto attached and made a part hereof for the construction described as follows:

JOSEPH SIMES HOUSE RENOVATION PROJECT

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 ____ () counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2016.

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)

Witness as to Surety (SEAL)

(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 00700

GENERAL CONDITIONS

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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 also include Bidding Documents such as the Advertisement or Invitation to Bid, the Instructions to Bidders, sample forms, the Contractor's Bid, performance and payment bonds, prevailing wage rate sheets, and any other document 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 and their Designer, are at least equal in quality, durability, appearance, strength and design, (2) will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased, and (3) conform substantially, even with deviations, to the detailed requirements for the item in the plans and specifications.

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, and shall write in large, conspicuous type: "THIS SUBMITTAL INCLUDES A REQUESTS FOR SUBSTITUTION." Any approval of a submittal not so marked shall not be deemed an approval of any proposed substitution contained in the submittal. 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 examined the Contract Documents, visited and inspected 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, and had submitted any questions he may have had regarding the Work or the Contract Documents to the Owner before submitting his bid, and that all such questions had been answered by Owner to Contractor's satisfaction, or Contractor otherwise satisfied himself as to the subject matter of his questions.

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 or is customarily performed as part of the Work so covered. 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 Designer will, for the benefit of the Owner not Contractor, visit the site at intervals appropriate to the stage of construction to inspect and familiarize himself with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents.

2.1.2 The Owner and Designer 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 Designer may perform its functions under the Contract Documents.

2.1.3 Based on the its observations and inspections of the Work and an evaluation of the Contractor's Applications for Payment, the Designer will make recommendations to the Owner of the amounts owing to the Contractor and will, subject to any claims of Owner, sign Certificates for Payment in such amounts, as provided in Paragraph 9.4.

2.1.4 The Designer will, upon reasonable request of Contractor, render information necessary for the proper execution or progress of the Work within thirty (30) days of the request of the contractor, unless additional time is reasonably required, in which event, within such longer period.

2.1.5 The Designer shall, in consultation with Owner, 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 Designer 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 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 Designer's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

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

2.1.8 The Designer 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, in consultation with Owner, 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 representative, which for this Project shall be the Designer and Owner's Project Manager.

3.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

3.2.1 The Owner shall, upon written request of Contractor, furnish available surveys, if any, describing the physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. Contractor understands and agrees that such information is for the convenience of Contractor and is not guaranteed by Owner; that Owner makes no representations and warranties regarding the same; and that it is Contractor's responsibility to satisfy itself as to the accuracy of any such surveys.

3.2.2 The Owner will furnish the Contractor with 3 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.

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

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, 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. 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 (direct or indirect) of the Contractor and, as reasonably demonstrated by Contractor, delays achievement of Substantial Completion of the Work, and provided Contractor has made claim in strict accordance with paragraph 8.2.3, 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, provided, however, that this shall be Contractor's sole remedy on account of any stoppage required through no fault of Contractor, and under no circumstances shall the Contractor be eligible for any additional compensation or reimbursement for any costs incurred as a result of such stoppage, except to the extent provided in G.L. c. 30, § 39O, for work stoppages ordered for the convenience of Owner that exceed 15 days.

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 written orders of the Owner, 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 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, including, but not limited to, fees of attorneys, project manager, and the Designer. 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 latent errors, inconsistencies or omissions in the Contract Documents unless (i) the error, inconsistency or omission was obvious, or he discovered or should have discovered the error, inconsistency or omission, and (ii) failed to notify Owner in writing of such errors, inconsistencies or omissions before submission of his bid. Where approved Shop Drawings, Product Data or Samples are required for any portion of the Work, the Contractor shall not perform the relevant portion of the Work

without such approved Shop Drawings, Product Data or Samples.

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 experienced, full-time supervisory personnel at the Premises during the performance of the Work. He shall, notwithstanding anything to the contrary in the Contract Documents, 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 (including filed sub-bidders, if any) 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 expressly 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 and that all Work will be of good quality, free from faults and defects and in strict 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. The warranty period shall be for a period of two years from substantial completion. The warranty provided herein is in addition to and not in limitation of any other right, remedy or warranty available to Owner, and shall not limit, abridge or otherwise affect any applicable statutory limitations periods.

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. Notwithstanding the foregoing, the Owner is exempt from sales taxes, and Contractor shall not charge or include in its applications for payment any such taxes.

4.7 PERMITS, FEES AND NOTICES

4.7.1 The Contractor shall secure and pay for all permits and fees, licenses and inspections necessary for the proper execution and completion of the Work, 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 required by, and shall 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.

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. Contractor shall not be liable for any damage to the Work arising from such variance unless and to the extent that (i) the variance was obvious, or was discovered or otherwise should have been discovered by the Contractor before submission of its bid and (ii) the Contractor failed to notify the Owner of the same in writing before the submission of its bid.

4.7.4 Notwithstanding the foregoing: If the Contractor performs any Work which he knows or should know is contrary to federal, state or local laws, ordinances, rules and regulations without having first given written notice to the Owner of the same and been advised by owner in writing, in response to such notice, to proceed with the Work, 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, full-time 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.

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 clearly showing all Work that is on the critical path such that any delay to such work shall delay Substantial or Final Completion of the Work. The progress schedule shall be related to the entire Project, and shall provide for expeditious and practicable execution of the Work. The schedule shall be in such form as the Owner and Designer shall require, and shall be updated every 30 days. Neither Owner's approval nor lack of approval of any schedule or schedule update shall relieve Contractor of its obligations under the Contract Documents, including, but not limited to, the scheduling obligations set forth above. Failure of Contractor to strictly comply with this Paragraph 4.9.1 shall result in the waiver of any and all claims of Contractor for extensions to the Contract Time and any and all defenses of Contractor to any assessment by Owner of liquidated damages on account of delays in the progress 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, 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 Designer's approval of Shop Drawings, Product Data or Samples unless (i) at the time of and within and as part of the submission, the Contractor has specifically and conspicuously informed the Designer in writing that the submission contains a deviation, and describes such deviation, and (ii) the Designer has given separate written approval to the specific deviation by making express reference to such deviation and stating that such deviation has been approved. Notwithstanding the foregoing: The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Designer's approval thereof.

4.11.7 The Contractor shall direct specific attention, in writing and on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Designer on previous submittals. No approval of the Designer to any resubmitted Shop Drawing, Product Data or Sample shall constitute an approval of any revision not requested by the Owner or Designer unless Contractor has complied with the preceding sentence, and the Designer has in writing expressly and separately referenced and approved such

revision.

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 Designer. 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, including any cutting and patching of all filed sub-bidders, if any.

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.

4.14 CLEANING UP

4.14.1 The Contractor shall at all times and on no less than a daily basis 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 comply with its obligations to keep the premises clean or 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 Contractor shall forward all communications to the Owner through the Designer.

4.16 ROYALTIES AND PATENTS

4.16.1 The Contractor shall pay all royalties and license fees. He shall, in addition to any other rights and remedies available to Owner, defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.

4.17 INDEMNIFICATION

4.17.1 To the fullest extent permitted by law, the Contractor shall, in addition to and not a limitation of any other rights and remedies available to Owner, indemnify and hold harmless the Owner, its agents 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 and is caused in whole or in part, directly or indirectly, by any 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 responsible, 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, its 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.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITION

5.1.1 A Subcontractor is a person or entity who has a 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 includes filed sub-bidders, if any, under G.L. c. 149, § 44F.

5.1.2 A Sub-subcontractor is a person or entity who has a 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 Upon the award of the Contract, the Contractor shall furnish to the Owner in writing the names of all subcontractors.

5.2.2 The Contractor shall not contract with any such proposed subcontractor to whom the Owner has made reasonable objection under the provisions of Subparagraph 5.2.1.

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 at no additional cost to Owner.

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

5.2.5 The foregoing shall not apply to filed sub-bidders, whose selection shall be determined in

accordance with G.L. c. 149.

5.2.6 Notwithstanding anything to the contrary in this Paragraph 5.2, any approval or lack of objection of the Owner regarding any proposed subcontractor (for a sub-trade that is not listed as a sub-trade in G.L. c. 149, s. 44F) pursuant to this Paragraph 5.2 shall not, under any circumstances, constitute the "approval" of a subcontractor for the purpose of G.L. c. 30, § 39F, and no such subcontractor shall have any rights under that statute on account of any approval or lack of objection of Owner.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By an appropriate written agreement, 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 such 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. The Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of 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, including, but not limited to, filed sub-bidders, if any. Notwithstanding the foregoing, no subcontractor shall have any rights under the Contract between the Owner and Contractor.

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.

6.1.2 When separate contracts are awarded by Owner 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 Each Contractor will provide for the coordination of the work of his own forces with the work of each separate contractor, and shall fully cooperate with each separate contractor.

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 in writing 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 in writing 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 Contractor 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, failing which the Owner shall withhold from amounts otherwise payable to Contractor the value of such damage, as

determined by the owner, until such damage is corrected by Contractor or, at the election of the Owner, by the Owner at Contractor's expense.

6.2.5 Should the Contractor wrongfully cause damage to the work or property of any separate contractor, the Contractor shall promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor asserts a claim against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall withhold the full value of such claim from amounts otherwise payable to Contractor; and if such damaged contractor shall sue or initiate any other proceeding against the Owner, the Contractor shall defend such proceedings at the Contractor's expense using counsel selected by Owner, and if any judgment or award against the Owner arises therefrom the Contractor shall immediately pay or satisfy it. Contractor shall also immediately reimburse the Owner for all attorneys' fees and court or arbitrations costs which the Owner has incurred in connection with any such suit or proceeding.

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, but is not required to, clean up and charge the entire cost thereof to the Contractor, and Owner may withhold such cost from amounts otherwise payable to Contractor.

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. Contractor agrees that any lawsuit arising out of this Contract shall be brought in the state court in Plymouth County, to whose jurisdiction Contractor hereby submits. Contractor agrees that service of a Complaint or other process may be effected upon it by certified mail.

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 in whole or in part without the advance 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, which consent Owner may withhold or condition in its sole discretion.

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 Procurement Division, Town Office Building, 11 Lincoln Street, Plymouth, MA, 02360.

7.4 CLAIMS FOR DAMAGES TO PERSON OR PROPERTY

7.4.1 Should Contractor suffer injury or damage to person or property because of any act or omission of the Owner or of any of his employees, agents or others for whose acts he is legally liable, claim shall be made in writing to Owner and Designer within a reasonable time after the first observance of such injury or damage. The reasonable time shall not exceed fourteen days. Failure of Contractor to comply strictly with this Paragraph 7.4 shall result in the permanent waiver of its claim for damages.

Notwithstanding the foregoing, and notwithstanding anything to the contrary in the Contract Documents, the Owner does not waive, and expressly reserves, all rights, remedies and defenses under G.L. c. 258,

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 must be two separate instruments in accordance with the forms provided in the Contract Documents, issued by sureties qualified to do business in Massachusetts and satisfactory to the owner, and shall remain in effect through the two-year warranty period provided in Paragraph 4.5.1.

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 or the Designer 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 timely notice of its readiness so the Owner may observe such inspection, testing or approval. The Contractor shall bear all costs of such inspections, tests or approvals. All testing

methods, organizations, and personnel shall be approved by the Owner before the start of testing Work, without regard to what party will ultimately pay for such Work, provided that no approval or lack thereof by the Owner shall relieve Contractor of its responsibilities for all testing of the Work.

7.7.2 If the Owner 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 fully and strictly 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 the reasonable costs of such inspection or testing.

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

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 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 Designer, in consultation with Owner, when (i) construction is deemed substantially complete

by the Owner, (ii) all that remains of the Work are minor punch list items the total value of which shall not exceed 1 percent of the original Contract Sum and the lack of or completion of which will not interfere with the Owner's use of the work, (iii) the Owner can lawfully occupy and utilize the Work for the use for which it is intended, and (iv) all governmental inspections of the Work have been successfully performed and all permits and other governmental approvals, including without limitation a certificate of occupancy, have been issued and have been furnished to the Owner by Contractor. The Date of Final Completion of the Work is the date on which (i) all Work, including punch list items, have been fully completed in accordance with the requirements of the Contract Documents and to the reasonable satisfaction of the Owner, and (ii) the Designer, in consultation with Owner, issues a 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 thirty (30) days 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 by any employee of the Owner, or by the Designer, or any separate contractor employed by the Owner, 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, in whole or in part, directly or indirectly, from the act, omission, or neglect of the Contractor or any of its Subcontractors (including filed sub-bidders, if any), and provided further that Contractor has made claim for a time extension in strict accordance with the following paragraph 8.3.2, the Contract Time shall be extended by Change Order for such reasonable time as the Owner may determine, and this shall be Contractor's sole remedy on account of any such delay notwithstanding anything to the contrary in the Contract Documents.

8.3.2 Any claim for extension of time shall be made in writing to the Owner not more than ten (10) days after (i) the commencement of the delay or (ii) the commencement of the event resulting in a delay, whichever is earlier; otherwise the claim shall be forever waived. In the case of a continuing delay only (i.e., a delay that is without interruption) one claim is necessary. The Contractor shall, in the same writing, provide an estimate of the probable effect of such delay on the progress of the Work. All decisions of Owner and/or Designer on claims of the Contractor shall be final and binding on Contractor in accordance with G.L. c. 30, § 39J.

8.3.3 Under no circumstances will Contractor be eligible for any damages on account of any delay, no matter by whom caused, and no matter how a claim for such damages may be characterized, whether, without limitation, as a claim for interruption of the work, loss of production, or for additional cost of performance allegedly incurred as a result of a delay.

8.4 LIQUIDATED DAMAGES

8.4.1 If the Contractor shall neglect, fail or refuse to substantially 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 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 Contract shall be in default after the time stipulated in the Contract for substantially 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 Contractor agrees that to the extent Owner contributes to any delay, Contractor shall nonetheless be responsible for payment of liquidated damages to the extent of the delays for which Contractor is responsible. Contractor also agrees that, notwithstanding anything to the contrary in the Contract Documents, Owner may, at the its sole election and in its sole discretion, elect to recover from Contractor Owner's actual damages in lieu of liquidated damages on account of any delay caused by Contractor, which actual damages Owner may withhold from amounts otherwise payable to Contractor.

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 reviewing 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 With advance written consent of Owner, payments may be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site and, if also 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 and properly 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 Designer will, within ten days after the receipt of the Contractor's Application for Payment and in consultation with the Owner, issue to the Owner a Certificate for Payment for such amount as the Designer recommends as due, if anything. Notwithstanding anything to the contrary in this Article 9 all certificates of payment issued by the Designer shall be subject to any claims of Owner against Contractor, whether or not such claims are referenced in such certificates, and whether or not such claims are related to work for which payment has been certified by the Designer, or made by the Owner.

9.4.2 The issuance of a Certificate for Payment will constitute a representation to the Owner by the Designer, based on its inspections of the Work 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; and that the Contractor is entitled to payment in the amount certified. However, by issuing a Certificate for Payment, the Designer 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 Designer has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, subject to a withholding for any claims

of the Owner. The Owner also reserves the right to a 5 percent general retainage from each progress payment, which shall be released to the Contractor in accordance with G.L. c. 149, § 39K.

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. Failure of Contractor to make payments to its subcontractors as stated herein shall constitute a material breach of its Contract with the Owner.

9.5.3 The Owner may, at its sole 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 Notwithstanding anything to the contrary in the Contract Documents: No Certificate for a Payment, nor any payment to Contractor, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work that is not in strict accordance with the Contract Documents.

9.6 PAYMENTS WITHHELD

9.6.1 The Designer shall decline to certify payment and withhold its Certificate in whole or in part, to the extent necessary reasonably to protect the Owner from loss, provided that any failure of the Designer to decline to certify payment shall not prevent the Owner from withholding from any payments due Contractor the value of Owner's claims against Contractor, as determined by Owner. If the Designer 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 Designer will, in consultation with the Owner, issue a Certificate for Payment for the amount for which it determines is properly due, subject to a withholding by the Owner of the value of any claims of the Owner. The Designer 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 the Owner 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
- .7 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, unless other reasons exist for continued withholding, such as other claims of the Owner.

9.6.3 Notwithstanding the foregoing, the issuance of any Certificate of Payment shall not prohibit the Owner from deducting from any progress payment the value of any claims of the Owner, whether or not such claims are referenced in the certificate or that such claims may have been a basis for the Designer to decline to issue a certificate of payment in whole or in part.

9.7 FAILURE OF PAYMENT

9.7.1 If the Designer does not issue a Certificate for Payment or Owner withholds payment in whole or in part for any of the reasons stated in Article 9, Contractor shall continue to perform all Work pending and notwithstanding any disputes concerning such non-issuance or withholding.

9.8 SUBSTANTIAL COMPLETION

9.8.1 When the Contractor considers the Work to be substantially complete as defined in Subparagraph 8.1.3, the Contractor shall prepare for submission to the Owner a monetized punch-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. Notwithstanding the foregoing, only when the Designer, on the basis of an inspection and in consultation with the Owner, determines that the Work is substantially complete, will the Designer then prepare a Certificate of Substantial Completion which shall establish the Date of Substantial Completion, may state the responsibilities of 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, which shall not exceed 30 days absent written agreement between the Owner and Contractor; and a punch-list of all remaining items of Work to be completed, which may include items of work not included in the Contractor's punch-list, provided, however, that any failure of the Designer to include all incomplete or defective items of work on the punch-list shall not relieve Contractor of its responsibility to complete and correct the same. Warranties required by the Contract Documents shall commence on the Date of Substantial Completion of the Work unless otherwise provided in the Certificate of Substantial Completion, which shall be submitted to the Owner and the Contractor for their signature.

9.8.2 Upon Substantial Completion of the Work, as determined by the Designer in consultation with Owner, and upon application by the Contractor for and Certification by the Designer of final payment, the Owner shall make final payment, reflecting adjustment in retainage, if any, for such Work and a

deduction for any claims of Owner, as provided in the Contract Documents and G.L. c. 30, § 39K.

9.9 FINAL COMPLETION AND FINAL PAYMENT

9.9.1 After a Certificate of Substantial Completion has been issued by the Designer, 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 Designer will make such inspection and, if and when the Designer, in consultation with the owner, finds that the Work is acceptable and in conformance with the Contract Documents and that the Contract has been fully performed, it will 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 fully completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor, less the value of the claims of the Owner, is due and payable. The Designer's final Certificate for Payment will constitute a further representation to the Owner 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 Notwithstanding the foregoing, final payment shall not become due until the Contractor submits to the Owner (1) an affidavit signed under pain and penalties of perjury, 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 to final payment but only if such consent is expressly required in the performance bond or payment bond 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 Owner may, in its sole discretion, either withhold from Contractor an amount equal to the amounts for which a release or waiver is requested of the subcontractor, or

require Contractor to furnish a bond satisfactory to the Owner to indemnify Owner against any such lien. The Contractor agrees that in the event it is ordered by any court to pay a subcontractor's attorneys' fees under G.L. c. 149, § 29, irrespective of whether all or any portion of any amounts owed by Contractor to subcontractor are deemed owed, but unpaid, by Owner to Contractor, the Contractor shall be solely responsible for payment of such fees, not the Owner.

9.9.3 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 precautions for the safety of, and shall provide all 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 required by, and shall 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 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 highest and utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 The Contractor shall immediately 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, directly or indirectly, 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 responsible and for which the Contractor is responsible under Clauses 10.2.1.2 and 10.2.1.3. The foregoing obligations of the Contractor are in addition to his obligation under Paragraph 4.13 and any other provision of the Contract Documents.

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 the safety of person or property, including the Work.

10.3 EMERGENCIES

10.3.1 In any emergency affecting the safety of persons or property, including the Work, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss.

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.

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 canceled 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 PROPERTY INSURANCE

11.2.1 The Contractor shall purchase and/or maintain property insurance upon the entire Work at the site to the full insurable value thereof. This insurance shall include the interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Work and shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss or damage including, without duplication of coverage, theft, vandalism and malicious mischief, and shall also include coverage for damage and/or loss resulting from defects or deficiencies in the design and construction of the Work. 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 under Subparagraph 9.3.2.

11.3.2 The Contractor waives all rights against Owner, its agents and employees each of the other, and separate contractors under contract with Owner, if any, and their subcontractors, sub-subcontractors, agents and employees (collectively, the "Owner Parties"), for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to Article 11 or any other property insurance. The Contractor shall require of its separate contractors, Subcontractors and Sub-subcontractors by written agreements similar waivers each in favor of the Owner Parties.

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

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 and ordering a change in the Work and/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.

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 if necessary. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents and applicable General Laws. Contractor shall promptly commence and diligently perform all Work ordered by Change Order pending and notwithstanding any disputes of the Contractor regarding the Change Order or the Work.

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, at the sole election of Owner, which election shall be final and binding on Contractor:

- .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 The Contractor shall promptly and diligently proceed with the Work involved in any Change Order pending and notwithstanding any dispute over such Work or the cost or credit to the Owner on account

of such Work. If the Owner has elected to determine payment to the Contractor under Clause 12.1.3.4 above, such cost 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, which determination shall be final and binding on Contractor. In such case, and also under Clause 12.1.3.3 above, the Contractor shall keep and present a thorough, detailed, and itemized accounting together with all supporting data and invoices for inclusion in a Change Order, failing which Contractor shall forever waive any rights to any additional compensation on account of the Work, as determined by Owner, which determination shall be final and binding on Contractor. Unless otherwise provided in the Contract Documents, cost shall be limited to the following: actual cost of materials, excluding sales tax but including cost of delivery; labor, including social security, old age and unemployment insurance, and fringe benefits required by prevailing wage laws of Massachusetts; and workers' or workmen's compensation insurance. The amount of credit to be allowed by the Contractor to the Owner for any deletion or change which results in a net decrease in the Contract Sum will be the amount of the actual net cost, which shall not be less than the amount, if any, set forth on Contractor's schedule of values for the Work, as determined by Owner, which determination shall be final and binding on Contractor. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any, with respect to that change.

12.1.5 Unit prices are stated in the Bid Form and the Contract 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.

12.1.6 Contractor's signature on a Change Order shall indicate its agreement to all changes and adjustments reflected in such Change Order.

12.2 UNFORESEEN SUBSURFACE/LATENT PHYSICAL CONDITIONS

12.2.1 Any claims of Contractor on account of unforeseen subsurface or latent physical conditions shall be subject to G.L. c. 30, § 39N. Notice of such claims shall be submitted to Owner and Designer in writing before the conditions are disturbed by Contractor, failing which Contractor shall have forever waived such claims. If such claims are not eligible for additional compensation under G.L. c. 30, § 39N, such claims shall not be eligible for additional compensation under these Contract Documents.

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 and Designer written notice thereof within ten (10) 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. Failure of Contractor to comply strictly with this Paragraph 12.3.1 shall result in the permanent waiver of Contractor's claims. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

12.3.2 All decisions of Owner and/or Designer on claims of the Contractor shall be final and binding on Contractor in accordance with G.L. c. 30, § 39J.

12.4 MINOR CHANGES IN THE WORK

12.4.1 The Designer will have authority to order, in consultation with the Owner, minor changes in the Work, which are defined as changes not involving an adjustment in the Contract Sum or an extension of the Contract Time. Such changes shall be affected by written order, and shall be binding on 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 Designer, or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Owner or Designer, 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 or Designer has not specifically requested to observe prior to being covered or which the Contract Documents do not require prior observation by Designer or Owner, the Owner or Designer 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 reasonable cost of uncovering and replacement shall be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall immediately 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 (including Owner's project manager, Designer and attorney).

13.2.2 The Contractor hereby warrants to the Owner that if within two years after the Date of Substantial Completion of the Work or designated portion thereof or within two years 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. This obligation shall survive termination of the Contract. 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, and do not abridge or change any applicable statutory limitations periods.

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 as provided in Paragraph 13.2.1 or within the time, if any, 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, and deduct all such expenses (including fees of Owner's project manager, Designer, and attorney) from amounts otherwise payable to Contractor. If such expenses exceed amounts then payable to Contractor and the Contractor does not pay the cost of such removal and storage within ten days after receipt of the aforesaid written notice from the Owner, the Owner may without further notice to Contractor 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 (including Owner's project manager, Designer and attorney). If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor. 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, all of which costs may be deducted by the Owner from amounts otherwise payable to Contractor.

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 two years 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. Any acceptance by Owner of defective or nonconforming work must, to be valid, expressly refer to the defective or nonconforming work and state unequivocally that the Owner is accepting such work as is and without correction.

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) consecutive 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 for or on behalf of the Contractor, then the Contractor may, upon 14 additional days written notice to the Owner, terminate

the Contract and recover from the Owner payment for all Work satisfactorily executed, as determined by Owner.

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, 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 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 (including fees of Owner's project manager, Designer and attorney), 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.

END OF SECTION

SECTION 00800

SUPPLEMENTAL GENERAL CONDITIONS

1. INTRODUCTION

The following is in addition to any insurance requirements contained in 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, together with a Certificate of Compliance therewith, are set forth in Attachment A herein.
3. The Insurance provisions of Article 11 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 Town of Plymouth and its employees, agents and officials, from all claims an 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 Town 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:

- 1) **General Liability** of at least \$1,000,000 Bodily Injury and Property Damage Liability, Combined Single Limit with a \$3,000,000 Annual Aggregate Limit. **The Town shall be named as an "Additional Insured"**. Products and Completed Operations should be maintained for up to 3 years after the completion of the project.
- 2) **Automobile Liability** of at least \$1,000,000 Bodily Injury and Property Damage per accident. **The Town shall be named as an "Additional Insured"**.
- 3) **Workers' Compensation Insurance** as required by law. Include Employers Liability Part B.

4) **Builders' Risk Property Coverage** for the full insurable value (completed value) of the portion of the building under construction. Builders Risk Coverage will include the current Replacement Cost Value of the existing structure. It should include "All Risk" insurance for physical loss or damage including theft.

5) **Property Coverage** for materials and supplies being transported by the contractor.

6) **Umbrella Liability** of at least \$2,000,000/ occurrence, \$2,000,000/aggregate. **The Town shall be named as an Additional Insured.**

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 Town of Plymouth 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.

Upon request of Owner, Contractor shall promptly provide Owner with copies of all insurance policies and endorsements thereto maintained by Contractor in compliance with the insurance requirements contained in the Contract Documents.

SECTION 00850

**Excerpts from Chapter 149 and Chapter 30 of the
Massachusetts General Laws**

Certain provisions of the Massachusetts General Laws are applicable to Construction contracts. Attention is directed to the following Sections of Chapter 149 as amended, provided, however, that Contractor is solely responsible to know all provisions of Chapter 149, and may not rely upon the summary provided below, and in the event of any conflict or inconsistency among the summary provisions set forth below and the actual provisions of Chapter 149, the latter shall control; and provided further that the provisions set forth below are not intended to be an exhaustive list of the provisions of Chapter 149:

Section 25. "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 town, 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 therein, that the employee shall lodge, board or trade at a particular place or with a particular person. This section shall be made a part of the contract for such employment."

Section 26. "In the employment of mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works by the commonwealth, or by a county, town or district, or by persons contracting or subcontracting for such works, preference shall first be given to citizens of the commonwealth who have been residents of the commonwealth for at least six months at the commencement of their employment who are male veterans as defined in clause Forty-third of section seven of chapter four, and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the commonwealth generally who have been residents of the commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, and every contract for such work shall contain a provisions to this effect..."

Section 34. "Every contract, except for the purchase of material or supplies, involving the employment of laborers workmen, mechanics, foremen or inspectors, to which the commonwealth or any county or any town, subject to section thirty, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working within the commonwealth, in the employ of the contractor, subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one-day or more than forty-eight hours in any one week, or more than six-days in any one week, except in cases of emergency, or in case any town subject to section thirty-one is a party to such a contract, more than eight hours in any one-day except as aforesaid..."

Section 34A. "Every contract for the construction, alteration, maintenance, repair or demolition of or addition to, any public building or other public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall, before commencing performance of such contract, provide by insurance for the payment of compensation and the furnishing of other benefits under chapter one hundred and fifty-two to all persons to be employed under the contract, and that the contractor shall continue such insurance in full force and effect

during the term of the contract. No officer or agent contracting in behalf of the commonwealth or any political subdivision thereof shall award such a contract until he has been furnished with sufficient proof of compliance with the aforesaid stipulations. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the contract and shall operate as an immediate termination thereof. No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the officer or agent who awarded the contract at least fifteen-days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing cancellation by registered mail, postage prepaid, with a return receipt of the addressee requested, shall be a sufficient notice..."

Section 34B. "Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall pay to any reserve police officer employed by him in any city or town the prevailing rate of wage paid to regular police officers employed by him in such city or town."

Section 44D. (1)(a) Every bid or offer submitted for a contract subject to section forty-four A shall be accompanied by a copy of a certificate of eligibility issued by the commissioner showing that the bidder or offeror has the classification and capacity rating to perform the work required. The bid or offer shall also be accompanied by an update statement in such form as the commissioner shall prescribe. A blank copy of such form shall be furnished by the awarding authority to every person or business entity requesting a copy. The update form shall provide space for information regarding all projects completed by the bidder or offeror since the date of certification of eligibility, all projects which the bidder or offeror currently has under contract including the percentage of work on such projects not completed, the names and qualifications of the personnel who will have supervisory responsibility for the performance of the contract, any significant changes in the bidder's or offeror's, financial position or business organization since the date of certification of eligibility, and such other relevant information as the commissioner shall prescribe. Any bid or offer submitted without the appropriate certificate and update statement shall be invalid.

(b) The applicant shall certify under penalties of perjury at the conclusion of the application to bid that there have been no substantial changes in his/her financial position or business organization other than those changes noted within the application since the applicant's most recent prequalification statement and that the bid to be made will be in all respects bona fide, fair and made without collusion or fraud with any other person. "Person" here means any natural person, joint venture, partnership, corporation or other business or legal entity which sells materials, equipment or supplies used in or for, or engages in the performance of, the same or similar construction, reconstruction, installation, demolition, maintenance or repair work or any part thereof.

Attention is directed to the following sections of Chapter 30 of the General Laws of Massachusetts as amended to date, provided, however, that Contractor is solely responsible to know all provisions of Chapter 30, and may not rely upon the summary provided below, and in the event of any conflict or inconsistency among the summary provisions set forth below and the actual provisions of Chapter 30, the latter shall control; and provided further that the provisions set forth below are not intended to be an exhaustive list of the provisions of Chapter 30:

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 I 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 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 subtrade and each subtrade 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, be 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 82herefore, 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 be 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 one hundred forty-nine which requires the awarding authority, or any official, its architect or engineer to make 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 event, 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 one 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 herefore 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.

(a) 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 hereof, 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 I below prior to the execution of the contract, and

(5) If the agreement is a contract as defined herein, the contractor has filed 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.

I 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 accountant'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.”

Section 40. 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 given 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 herefore specifically relating to the unexpired guarantees shall be taken.

ATTACHMENT 1

Technical Specifications

LIST OF DRAWINGS

T1.0	Title Sheet	S2.0	Structural Details
L1	Existing Site Condition Plan	S2.1	Structural Details
L2	Site Preparation Plan	S2.2	Structural Details
L3	Layout & Materials Plan	S2.3	Structural Details
L4	Grading Plan	FP0.1	Fire Protection Legend, Notes, & Details
L5	Planting Plan	FP1.1	Basement & First Floor Fire Protection Plans
C1	Site Utilities Plan	FP1.2	Second & Third Floor Fire Protection Plans
C2	Septic System Plan	P0.1	Plumbing Legend, Schedules, & Notes
D1.1	Basement and Floor 1 Demolition Plan	P1.1	Basement & First Floor Plumbing Plans
D1.2	Floor 2 and Floor 3 Demolition Plans	P1.2	Second & Third Floor Plumbing Plans
D1.3	Roof Demolition Plan	P1.3	Roof Plumbing Plan
A1.1	Basement and Floor 1 Plans	P2.1	Plumbing Details
A1.2	Floor 2 and Floor 3 Plans	M0.1	Mechanical Legend & Notes
A1.3	Roof Plan	M0.2	Mechanical Schedules
A2.1	Longitudinal Section	M1.1	Basement & First Floor Mechanical Plans
A2.2	Transverse Section	M1.2	Second & Third Floor Mechanical Plans
A3.1	East End Elevation	M1.3	Roof Mechanical Plans
A3.2	South Side Elevation	M2.1	Mechanical Details
A3.3	North Side Elevation	M2.2	Mechanical Details
A4.1	Schedules	SE-1	Site Electrical Plan
A4.2	Details	E1.1	Basement & First Floor Lighting Plans
S0.1	Structural General Notes	E1.2	Second & Third Floor Lighting Plans
S0.2	Structural General Notes	E1.3	Basement & First Floor Electrical Power Plans
S0.3	Structural General Notes	E1.4	Second & Third Floor Electrical Power Plans
S1.1	Foundation Plan & First Floor Framing Plan	E3.1	Electrical Riser Diagrams, Schedules, & Legend
S1.2	Second & Third Floor Framing Plan	FA1.1	Basement & First Floor Fire Alarm Plans
S1.3	Roof Framing Plan		
FA1.2	Second & Third Floor Fire Alarm Plans		
FA3.1	Fire Alarm Riser Diagram & Legend		

SECTION 01010

SUMMARY OF WORK

1. GENERAL SCOPE OF WORK

- A. This property is listed on the National Register of Historic Places and is protected by a detailed Preservation Restriction held by the Massachusetts Historical Commission. All work on this property, including maintenance, repair and restoration, is subject to review by the Massachusetts Historical Commission and must strictly comply with the Secretary of the Interior's Standards for the Treatment of Historic Building (36 CFR 68).
- B. The project consists of renovation of the interior spaces into meeting spaces, exhibit spaces, offices and residential apartments and addition of an enclosed egress stair and Limited Use/Limited Application elevator.
- C. The work includes, but is not limited to, selective demolition of the existing one story ell, excavation and backfill for new footings and foundations, construction of the concrete foundations and wood framed superstructure for the new three story plus basement stair and elevator addition, construction of a concrete and stone veneer handicapped ramp, selective demolition and renovation of existing finishes, installation of new finishes including veneer plaster, ceramic tile, wood flooring, and paint, new stairs, elevator installation, installation of cabinets and appliances for residential kitchens, handicapped accessible public restrooms, mechanical systems, electrical systems and plumbing systems, and associated miscellaneous items.
- D. In addition, the Work under the Contract includes:
 - (1.) The restoration of any items damaged or destroyed by encroaching upon areas outside the Project Site.
 - (2.) Providing all temporary facilities and restoring affected areas to their original condition, where appropriate.
 - (3.) The Contractor shall be responsible for obtaining required building permits and paying required fees.

2. TIME OF COMPLETION

- A. The work is to be performed on a construction schedule developed in accordance with the *General Conditions of the Contract for Construction* and shall be complete within two hundred and forty (240) consecutive calendar days from the Notice to Proceed.

END OF SECTION

SECTION 01020

UNIT PRICES

1. GENERAL PROVISIONS

The Unit Prices for items set forth in the Schedule of Unit Prices shall be used to determine adjustments to the Contract Sum when changes in the Work involving said items are made in accordance with Article 8 of the General Conditions and other sections of the Contract Documents.

2. REQUIREMENTS

- A. Unit Prices shall be computed to include net cost plus overhead, profit, and bond and all other charges required to complete the work item for both additions and deductions.
- B. Unit Prices net cost includes the cost of all labor, materials, equipment, disposal, and all other costs required to complete the work item.
- C. Unit Prices shall apply until the date of Contract Completion established at the time of the Notice to Proceed. If the date of Contract Completion has been modified by Change Order, Unit Prices may be adjusted at the discretion of the Owner.
- D. 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.

3. APPLICABILITY OF UNIT PRICES

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

4. SCHEDULE OF UNIT PRICES

- A. **Replacement of Existing Piers** - Cost per pier for each existing replacement of masonry pier as noted on drawing S1.1

END OF SECTION

SECTION 01030

ALTERNATES

1. SCOPE

- E. This Section lists the Alternates which appear in the Contract Documents. Consult the individual sections for the detailed requirements of each Alternate.
- F. Bid prices for each Alternate shall include overhead, profit, and all other expenses incidental to the Work under each Alternate.
- G. The Contractor and Subcontractors shall be responsible for examining the scope of each Alternate generally defined herein and for recognizing modifications to the Work caused by the Alternates and including the cost thereof in the bid price.

2. SCHEDULE OF ALTERNATES

ALTERNATE NO. 1 Add an additional stop to the LULA elevator. It shall be a 3 stop elevator going from Floor 1 to Floor 3, rather than ending at Floor 2

END OF SECTION

SECTION 01050
CONDUCT OF THE WORK

1.01 GENERAL PROVISIONS

The Conditions of the Contract and other Sections of Division I, General Requirements apply to this section.

1.02 MEETINGS

A. PRE-CONSTRUCTION MEETING

1. The Architect will schedule a pre-construction meeting within 7 days of issuance of Notice to Proceed, to be attended by all project managers, Contractor's field superintendent, and representatives of major sub-contractors. At this time, Contractor shall make specified pre-construction submittals including following:
 - i. Typed list of Contractor's sub-contractors, consultants and personnel (including superintendent and principal assistants), with addresses and telephone numbers.
 - ii. Certificates of insurance.
 - iii. Construction schedule.
 - iv. Schedule of values.
 - v. Permits.
 - vi. Specified bonds.
 - vii. Executed contract agreements.

2. Pre-construction meeting agenda will include following:
 - i. Processing applications for payment.
 - ii. Processing and distribution of submittals.
 - iii. Maintenance of record documents.
 - iv. Procedure for field changes, change estimates, change orders, etc.
 - v. Site and building security.
 - vi. Location and maintenance of temporary storage areas, field offices, vehicular parking and access, waste disposal, etc.

vii. Safety and first-aid procedures.

B. PROGRESS MEETINGS, REPORTING

1. General: In addition to specific coordination and pre- installation meetings for each element of work, and other regular project meetings held for other purposes, hold a general progress meeting each month with time coordinated with preparation of the payment request. Require each entity then involved in planning, coordination or performance of work to be properly represented at each meeting: Review each entity's present and future needs including interface requirements, time, sequences, deliveries, access, site utilization, temporary facilities and services, hours of work, hazards and risks, housekeeping, change orders, and documentation of information for payment requests. Discuss whether each element of current work is ahead of schedule, on time, or behind schedule in relation with updated progress schedule. Determine how behind-schedule work will be expedited, and secure commitments from entities involved in doing so. Discuss whether schedule revisions are required to ensure that current work and subsequent work will be completed within Contract Time. Review everything of significance which could affect progress of the work

1.03 PROJECT MANAGEMENT

- A. The Contractor's attention is directed to the General Conditions.
- B. The work must be completed in a continuous uninterrupted operation. The Contractor must use sufficient personnel and adequate equipment to complete all the necessary work requirements within a minimum period of time.
- C. Unless specifically authorized by the Owner, in writing, the work must be conducted between the hours of 7:00 a.m. and 3:30 p.m. on Monday through Friday. No work is to be done on holidays, Saturdays, or Sundays other than for emergencies.
- D. The Contractor is responsible for the security of partially completed work until the project is accepted by the Owner.
- E. There shall be no storage of materials, tools, and/or equipment within any of the occupied building. Any storage within unoccupied dwelling units must be authorized by the Owner, in writing.
- F. Only materials and/or equipment intended and necessary for immediate use shall be brought into the building. At the end of each work day and at the completion of each phase of work, equipment and leftover or unused materials shall be removed from the building.
- G. Workers shall refrain from smoking any while on the property, including interior, exterior and basement areas. The Contractor shall remove from the project workers who consistently violate this provision.

1.04 SCHEDULE OF VALUES

- A. Refer to General Conditions for general provisions governing schedule of values and applications for payment. For these submittals, use AIA Document G702/703, Application and Certificate for Payment. Use Specifications Sections as listed in Table of Contents as basis for format for listing costs. Itemize change orders separately as they are approved.

1.05 CONSTRUCTION SCHEDULE

- A. Refer to General Conditions for general provisions governing construction progress schedule. Schedule shall show activities, itemized according to specification Section, and be organized in bar-

chart or graph form so as to show both projected and actual progress of work. Submit updated schedule monthly, together with application for payment.

- B. Bar-Chart Schedule: Submit a bar-chart type progress schedule not more than 7 days after the date established for commencement of the work. On the schedule, indicate a time bar for each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Show completion of the work sufficiently in advance of the date established for substantial completion of the work.

1.06 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary to securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

1.07 COORDINATION

- A. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection and operation.

- B. The Contractor shall submit for approval to the Owner a detailed operational plan showing the sequence of operations prior to commencement of any work at the site. Any changes to this operational plan must be approved by the Owner.
 - C. The Contractor must retain on the Work during its progress a competent full time representative, satisfactory to the Owner. This representative shall not be changed, except with the consent of the Owner. The representative shall be in full charge of the work and all instructions given to this person by the Architect shall be binding.
 - D. The Contractor must supply to the Owner the home telephone number of a responsible person who may be contacted during non-work-hours for emergencies on the Project.
 - E. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
 - F. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - G. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
 - H. Prepare similar memoranda for the Owner and separate contractors where coordination of their Work is required.
 - I. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of schedules
 - 2. Installation and removal of temporary facilities
 - 3. Delivery and processing of submittals
 - 4. Progress meetings
 - 5. Project Close-out activities
 - J. Personnel: The Contractor shall employ a full time project site superintendent for this project. The superintendent shall be equipped with a portable telephone and pager.
 - K. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.
- 1.08 COORDINATION DRAWINGS:
- A. Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
 - 1. Show the interrelationship of components shown on separate Shop Drawings.
 - 2. Indicate required installation sequences.
 - 3. Comply with requirements contained in Section "Submittals."

1.09 OWNER'S COOPERATION

- A. The Owner shall assist the Contractor to perform the Work in accordance with the approved operational plan by removing obstructions that may be in the Contractor's way, upon proper notice from the Contractor.

1.10 CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS

- A. See General Conditions of the Contract

1.11 RETAINED ITEMS

- A. The following items which are to be removed and are in good condition shall be retained by the Owner (at the discretion of the Owner) and shall be stored at a location directed by the Owner:
(Mantelpiece at floor 2 Rear (east) Bedroom)

END OF SECTION

SECTION 01300

SUBMITTALS - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1.01 GENERAL

- A. The "General Conditions" and other Sections of "Division 1 -- General Requirements" form part of this Section.
- B. Non-Compliance: The Contractor shall assume all cost, direct and indirect, for the removal and replacement of any materials or items incorporated into the work without the required approval submittal for said material, found to be in non-compliance with the Specifications.
- C. Architect's review is for general conformance with the design-concept and Contract Documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures therefrom. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of assembly, and for performing the work in a safe manner.

1.02 RELATED DOCUMENTS

- A. This Section supplements the Contract and the General Conditions of the Contract.
- B. Consult the individual sections of the specifications for the specific submittals required under those sections and for further details and descriptions of the requirements.

1.03 GENERAL PROCEDURES FOR SUBMITTALS

- A. Timeliness - The Contractor shall transmit each submittal to the Architect sufficiently in advance of performing related Work or other applicable activities so that the installation is not delayed by processing times, including disapproval and resubmittal (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 in advance of the Work. Processing time shall typically take two (2) weeks from receipt of the submittal by the Architect to transmittal back to the Contractor.
- B. Sequence - The Contractor shall transmit each submittal in a sequence which will not result in the Architect's approval having to be later modified or rescinded by reason of subsequent submittals which should have been processed earlier or concurrently for coordination.
- C. Contractor's Review and Approval -
 - 1. The Contractor shall review and approve submittals (including sub-contractors' submittals) before transmitting to the Architect.
 - 2. Only submittals received from and bearing the stamp of approval of the Contractor will be considered for review 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, or Drawing No. to which the submittal refers, purpose (first submittal, resubmittal), description, remarks, distribution record, and signature of transmitter.
- D. Architect's Action - The Architect will review the Contractor's submittals and return them with one of the following actions recorded thereon by appropriate markings:
 - 1. **Final Unrestricted Release**: Where marked "No Exceptions Taken" the Work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents.
 - 2. **Final-But-Restricted Release**: When marked "Note Markings" the Work 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 on these compliances.

3. **Returned for Resubmittal:** When marked "Revise and Resubmit" or "Disapproved" the Work covered by the submittal (such as 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.

- E. **Processing** - All costs for printing, preparing, packaging, submitting, resubmitting, and mailing, or delivering submittals required by this contract shall be included in the Contract Sum.

1.04 SUBSTITUTIONS

- A. **Definition** - Whenever a specification section names one or more brands for a given item, and the Contractor wishes to submit, for consideration, another brand, the submission shall be considered an "or-equal" or a "material substitution". For the purposes of this Contract, the terms "or-equal" and "material substitution" shall be considered synonymous.
- B. In no case may an item be furnished on the Work other than the item named or described, unless the Architect, in writing, shall consider the item equal to the item so named or described.
- C. The equality of items offered as "equal" to items named or described shall be proved to the satisfaction of the Architect at the expense of the Contractor submitting the substitution.
- D. The Architect and/or the Owner may require that full size samples of both the specified and proposed products be submitted for review and evaluation. The Contractor shall bear full cost for providing, delivering, and disposal of all such samples.
- E. The Contractor shall assume full responsibility for the performance of any item submitted as an "Or-Equal" and assume the costs of any changes in any Work which may be caused by such substitution. B. Submit proposals to provide products other than those specifically named in ample time before product is to be incorporated in Work, in order to allow for full investigation of proposal. Thoroughly document proposal with manufacturers' literature, shop drawings and samples, as appropriate and as requested by Architect.
- F. Contractor shall warrant as part of his request that proposed alternative product is comparable in size, operation, material, finish and quality to product specifically named. He shall further warrant that he will provide same warranty. as for product specified.
- G. Contractor shall be responsible for coordination of accepted substitution into Work and waives all claims for additional costs related to substitution which subsequently become apparent.
- H. Architect retains absolute right of approval of any proposed substitution, and may reject same on any grounds including appearance.
- I. **Or Equal Approval Process** - On the transmittal, or on a separate sheet attached to the submission, the Contractor shall direct attention to any deviations, including minor limitations and variations, from the Contract Documents.
 1. The Contractor shall submit to the Architect for consideration of any or-equal substitution a written point-by-point comparison containing the name and full particulars of the proposed product and the product named or described in the Contract Documents.
 2. Such submittal shall in no event be made later than 120 calendar days prior to the incorporation of the item into the Work. In any case in which the time period specified in the Contract Documents from the Notice to Proceed to Substantial Completion is less than 120 days, this requirement can be waived by the Architect.
 3. Upon receipt of a written request for approval of an or-equal substitution, the Architect shall investigate whether the proposed item shall be considered equal to the item named or described in the Contract Documents. Upon conclusion of the investigation, the Architect shall promptly advise the Contractor in writing that the item is, or is not, considered acceptable as on Or-Equal substitution.

1.05 SUBMISSION OF SHOP DRAWINGS

- A. Shop Drawings shall be complete, giving all information necessary or requested in the individual section of the specifications. Shop Drawings shall be for whole systems and assemblies. They shall also show adjoining Work and details of connection thereto.
- B. Partial submissions will not be accepted.
- C. The Architect reserves the right to review and approve shop drawings only after approval of related product data and samples.
- D. Shop drawings shall be properly identified and contain the name of the project, name of the firm submitting the shop drawings, shop drawing number, date of shop drawings and revisions, Contractor's stamp of approval, and sufficient spaces near the title block for the Architect's stamp.
- E. The Contractor shall submit sufficient copies of each shop drawing for the Architect to retain two (2) copies of the submittal on file. Transparency and prints shall be mailed or delivered in roll form. Each submittal shall be accompanied by a transmittal notice.
- F. When the shop drawing is returned by the Architect with the stamp "Resubmit" or "Rejected", the Contractor shall correct the original drawing or prepare a new drawing and resubmit a transparency and two prints thereof to the Architect for approval. This procedure shall be repeated until the Architect's approval is obtained.
- G. When the transparency is returned by the Architect with the stamp "No Exceptions Taken" or "Note Markings", the Contractor shall provide and distribute the prints for all Contractor and Subcontractors use.
- H. The Contractor shall maintain one full set of approved shop drawings at the site.

1.06 SUBMISSION OF PRODUCT DATA

- A. The Contractor shall submit 7 copies of Product Data to the Architect. All such data shall be specific and identification of material or equipment submitted shall be clearly marked in ink. Data of general nature will not be accepted.
- B. Product Data shall be accompanied by a transmittal notice. The Contractor's stamp of approval shall appear on the printed information itself, in a location which will not impair legibility.
- C. Product Data returned by the Architect as "Disapproved" shall be resubmitted in 7 copies until the Architects approval is obtained.
- D. When the Product Data are acceptable, the Architect will stamp them "Approved" or "Approved as Corrected", retain 3 copies, and return 4 copies to the Contractor. The Contractor shall provide and distribute additional copies as may be required to complete the Work.
- E. The Contractor shall maintain one full set of approved, original, Product Data at the site.

1.07 SUBMISSION OF SAMPLES

- A. Unless otherwise specified in the individual section, the Contractor shall submit two specimens of each sample.
- B. Samples shall be of adequate size to permit proper evaluation of materials. Where variations in color or in other characteristics are to be expected, samples shall show the maximum range of variation. Materials exceeding the variation of approved samples will not be approved on the Work.
- C. Samples of items of interior finishes shall be submitted all at once to permit a coordinated selection of colors and finishes.
- D. Samples which can be conveniently mailed shall be sent directly to the Architect, accompanied by a transmittal notice. All transmittals shall be stamped with the Contractor's approval stamp of the material submitted.

- E. All other samples shall be delivered at the field office 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.
- F. If a sample is rejected by the Architect, a new sample shall be resubmitted in the manner specified hereinabove. This procedure shall be repeated until the sample is approved by the Architect.
- G. 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 is made in the specifications, at no additional cost to the Owner.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

1. GENERAL REQUIREMENTS

- A. 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 reproviding any facility removed prior to Substantial Completion
- B. Removal of all temporary facilities and restoration of affected areas to their original condition, where appropriate, shall be a condition precedent to Substantial Completion unless directed otherwise by the Architect or specifically noted in the specifications.
- C. The Contractor must comply with all safety laws and regulations of the Commonwealth of Massachusetts, the United States Government, and local government agencies applicable to Work under this contract. The Contractor's attention is directed to the Commonwealth of Massachusetts, Department of Labor and Industries Regulation 454 CMR.

2. FIELD OFFICES

- A. The Contractor shall provide a suitable office at the site for use by Contractor personnel.
- B. The Contractor shall provide a suitable office at the site for use by the Owner's Project Manager. The office shall be provided with power, phone, and internet service
- C. The offices shall be set in a location approved by the Architect, and shall be maintained by the Contractor in a clean and orderly condition.

3. TEMPORARY TELEPHONES

- A. The Contractor shall provide telephone service for the use of the Contractor's authorized personnel, Subcontractors, and Owner's Project Manager. The Site Superintendent shall have a portable phone.
- B. The Contractor shall pay for the installation and removal of the foregoing temporary telephones and for all calls and charges in connection therewith.

4. TEMPORARY TOILETS

- A. The Contractor shall provide and service an adequate number of toilet booths with chemical type toilets.
- B. The toilets shall be erected in a 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.

5. TEMPORARY CONSTRUCTION FENCE

- A. The Contractor shall be responsible for providing and maintaining temporary fencing or barricades around the construction as may be necessary to assure the safety of all persons authorized or unauthorized. Such protective measures shall be located and constructed as required by local, state, and federal ordinances, laws, codes, or regulations.

6. TEMPORARY STRUCTURES AND MATERIAL HANDLING

- A. Site staging and storage space will be made available to Contractor in an area or areas

designated by Owner.

- B. The Contractor shall provide such storage sheds, temporary buildings, or trailers as required for the performance of the Contract. Subcontractors shall provide their own temporary buildings and trailers.
- C. Materials shall be handled, stored, installed, cleaned, and protected in accordance with the best practice in the industry and, except where otherwise specified in the Contract Documents, in accordance with manufacturer's specifications and directions.
- D. The Contractor must obtain the permission of the Owner for the use of any storage facilities available on site, but the Owner assumes no responsibility for articles stored.

7. TEMPORARY STAGING, STAIRS, CHUTES

- A. Except as otherwise specified, the Contractor shall furnish, install, maintain in safe condition, and remove all scaffolds, staging, and planking over 8 ft. in height, as required for the use of all trades for proper execution of the Work.
- B. The Contractor shall furnish, install, maintain in safe condition, and remove all temporary ramps, stairs, ladders, and similar items as required for the use of all trades for the proper execution of the Work.
- C. Debris shall not be allowed to fall freely from upper levels of the building.

8. HOISTING FACILITIES

- A. Except as otherwise specified, the Contractor shall provide, operate, and remove material hoists, cranes, and other hoisting as required for the performance of the Work by all trades. All such hoisting service shall be without cost to the Subcontractors.

10. TEMPORARY WATER

- A. The Contractor may make use of the available water supply at the site for construction purposes, provided the permission of the Owner is obtained beforehand and only as long as the water is not used wastefully.
- B. The Contractor shall provide all necessary piping and hoses to utilize the available sources of water.
- C. The Contractor shall provide an adequate supply of cool drinking water with individual drinking cups for personnel on the job.

11. TEMPORARY ELECTRICITY

- A. The Contractor shall provide temporary electrical service to supply power metered and paid for by the Contractor.
 - (2.) The temporary electric service shall include, but not be limited to labor, materials, and equipment necessary to supply temporary power of adequate capacity for the project.
 - (3.) The Contractor shall only connect to power outlets designated by the Owner.
- B. Temporary electrical Work shall be performed under the direct supervision of at least one master electrician, who will be present on the project at all times when such work is being performed.
- C. The Contractor shall furnish, install, and maintain lamps in operating condition. The Contractor, and each Subcontractor, shall furnish their own extension cords and additional lamps as may be required for their work. Temporary work of a special nature, not otherwise specified hereunder, shall be provided, maintained, and paid for the trade requiring same.

- D. All lamps installed in permanent lighting fixtures and used as temporary lights during the construction period shall be removed and replaced shortly before Substantial Completion by the set of lamps required to be provided under the Electrical section of the specifications.
- E. All temporary work shall be provided in conformity with the National Electric Code, State laws, and requirements of the power company. Particular attention is called to Commonwealth of Massachusetts, Department of Labor and Industries Regulation, 454 CMR.

12. WEATHER PROTECTION

- A. The Contractor shall provide temporary enclosures to permit work to be carried on during the months of November through March in compliance with MGL c.149 §44G (d). These specifications are not to be construed as requiring enclosures or heat for operations that are not economically feasible in the opinion of the Owner. Without limitation this includes such items as excavation, pile driving, steel erection, erection of certain exterior wall panels, roofing, and similar operations.
- B. "Weather Protection" means the temporary protection of that Work adversely affected by moisture, wind, and cold by covering, and enclosing. This protection shall provide adequate working areas during the months of November through March as determined by the Owner and consistent with the construction schedule to permit the continuous progress of all Work necessary to maintain an orderly and efficient sequence of construction operations. The Contractor shall furnish and install "Weather Protection" material and be responsible for all costs. This provision does not supersede any specific requirements for methods of construction, curing of materials, or the applicable conditions set forth in the Contract Documents with added regard to performance obligations of the Contractor.
- C. Within 30 calendar days after award of the Contract, the Contractor shall submit in writing, to the Architect for approval, three (3) copies of the proposed methods for "Weather Protection".
- D. The Contractor shall assume the entire responsibility for weather protection during construction (until Substantial Completion), and shall be liable for any damage to any Work caused by failure to supply proper weather protection and proper ventilation.
- E. Work damaged by frost shall be removed and replaced by and at the Contractor's expense and as directed by the Architect.
- F. It is to be specifically understood that the Contractor shall do no work under any conditions deemed unsuitable by the Contractor to the execution of the Work. This provision shall not constitute any waiver, release, or lessening of the Contractor's obligation to bring the Work to Substantial Completion within the period of time set forth in the Contract Documents.

END OF SECTION

SECTION 01510

PROTECTION

1. PROTECTION OF PERSONS & PROPERTIES

- A. The building will be occupied during construction. The Contractor shall take all necessary precautions to ensure the public safety and convenience of the occupants during construction.
- B. Any damage to buildings, roads, (public and private), bituminous concrete areas, fences, lawn areas, trees, shrubbery, poles, underground utilities, etc. shall be made good by and at the Contractor's own expense, all to the satisfaction of the Owner.
- C. The Contractor shall patch, repair and/or replace all adjacent materials and surfaces damaged after the installation of new work at no expense to the Owner. All repair and replacement work shall match the existing in kind and appearance.

2. TEMPORARY PROTECTION

A. The Contractor shall:

- (1.) Protect buildings, and materials at all times from rain water, ground water, backing-up, or leakage of sewers, drains, or other piping, or from water damage of any origin. Provide all pumps, piping, coverings, and other materials and equipment as required by job conditions to accomplish this requirement.
 - (2.) In addition to the weather protection during the months of November to March specified elsewhere, provide temporary watertight enclosures for openings in exterior walls and in roof decks when and as required to protect the Work from damage by inclement weather. Temporary enclosures shall be provided with adequate means of ventilation to prevent accumulation of moisture in the buildings.
 - (4.) Protect sills, jambs, and heads of openings through which materials are handled.
 - (5.) Protect decks and slabs to receive work by other trades from any soiling which will prevent proper adhesion of subsequent Work. Decks and slabs shall be left clean and free of blemishes at the time other trades begin the application of their work.
 - (6.) Protect concrete slabs to remain exposed and finished floors against mechanical damage, plaster droppings, oil, grease, paint, or other material which will stain the floor finish. Install and maintain adequate strips of building paper or other protection on finished floors in rooms where future Work will be done by other trades.
 - (7.) Protect all surfaces to receive work by other trades from any soiling which will prevent proper execution of subsequent work.
 - (8.) Protect other areas, furniture, and private property of the resident and the Owner. Any areas damaged by the Contractor shall be restored to the original condition or compensated at the Contractor's expense.
- B. Roof surfaces and waterproofed surfaces shall not be subjected to traffic nor shall they be used for storage of materials. Where some activity must take place in order to carry out the Work, adequate protection must be provided.
- C. After the installation of the Work by any Subcontractor is completed, the Contractor shall be responsible for its protection and for repairing, replacing, or cleaning any such Work which has been damaged by other trades or by any other cause, so that all Work is in first class condition at the time of Substantial Completion.

3. ACCESS

- A. The Contractor shall, at all times, leave an unobstructed way along walks and roadways, and shall maintain barriers and lights for the protection of all persons and property in all locations where materials are stored or work is in progress.

4. SECURITY

- A. The Contractor shall be responsible for providing all security precautions necessary to protect the Contractor's and Owner's interests in the Work.

5. NOISE AND DUST CONTROL

- A. The Contractor shall take special measures to protect the residents, neighbors, and general public from noise, dust, and other disturbances by:

- (1.) Keeping common pedestrian and vehicular circulation areas clean and unobstructed;
- (2.) Insulating work area from occupied portions as far as possible; and
- (3.) Sealing dust and fumes from contaminating occupied spaces.

6. FIRE PROTECTION

- A. The Contractor shall take necessary precautions to insure against fire during construction. The Contractor shall be responsible to insure that the area within contract limits is kept orderly and clean and that combustible rubbish and construction debris is promptly removed from the site.
- B. Installation of equipment suitable for fire protection shall be done as soon as possible after commencement of the Work. The Contractor's attention is directed to the requirements of the Commonwealth of Massachusetts, Department of Labor and Workforce Development Regulation 454 CMR.

7. 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 the adjacent property.

8. WEATHER PROTECTION

- A. The Contractor shall provide Weather Protection as required by Specification Section 01500 Temporary Facilities and any other specific requirements of the Contract Documents.

END OF SECTION

SECTION 01520

CLEANING UP

1. RELATED DOCUMENTS

- A. This section supplements the General Conditions.
- B. Consult the individual sections of the specifications for cleaning of Work installed under those sections.

2. CLEANING DURING CONSTRUCTION

- A. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
 - 1. Do not burn or bury rubbish and waste materials on the site.
 - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 3. Do not dispose of wastes into streams or waterways.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- C. Do not allow materials and rubbish to drop free or be thrown from upper floors, but remove by use of a material hoist or rubbish chutes.
- D. Maintain the Site free from accumulations of waste, debris, and rubbish.
- E. Provide on-site containers for collection of waste materials and rubbish.
- F. At the end of each day, remove and legally dispose waste materials and rubbish from site.
- G. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
- H. Disposal of materials shall be in compliance with all applicable laws, ordinances, codes, and by-laws.

3. FINAL CLEANING

- A. Prior to submitting a request to the Architect to certify Substantial Completion of the Work, the Contractor shall inspect all interior and exterior spaces and verify that all waste materials, rubbish, tools, equipment, machinery, and surplus materials have been removed, and that all sight-exposed surfaces are clean. Leave the Project clean and ready for occupancy.
- B. Unless otherwise specified under other sections of the Specifications, the Contractor shall perform final cleaning operations as herein specified prior to final inspection.
- C. Cleaning shall include all surfaces, interior and exterior, which the Contractor has had access to, whether new or existing.
- D. Employ experienced workmen or professional cleaners for final cleaning.
- E. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.
- F. Use cleaning materials which will not create a hazard to health or property and which will not damage surfaces.

- G. All broken or defective glass caused by the Contractor's Work shall be replaced at the expense of the Contractor.
- H. Remove grease, mastic, adhesive, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior surfaces. This includes cleaning of the Work of all finishing trades where needed, whether or not cleaning by such trades is included in their respective specifications.
- I. Clean and polish all new and existing glass and plastic glazing (if any) throughout the building(s), on the outside. Clean plastic glazing in accordance with the manufacturer's directions. This cleaning shall be completed by qualified window cleaners at the expense of the Contractor just prior to acceptance of the Work.
- J. Repair, patch, and touch up marred surfaces to the specified finish, to match adjacent surfaces.
- K. Polish glossy surfaces to a clear shine.
- L. Leave all architectural metals, hardware, and fixtures in undamaged, polished conditions.
- M. Leave pipe and duct spaces, plenums, furred spaces and the like clean of debris and decayable materials.
- N. In cleaning items with manufacturer's finish or items previously finished by a Subcontractor, care shall be taken not to damage such manufacturer's or Subcontractor's finish. In cleaning glass and finish surfaces, care shall be taken not to use detergents or other cleaning agents which may stain adjoining finish surfaces. Any damage to finishes caused by cleaning operations shall be repaired at the Contractor's expense.
- O. Broom clean exposed concrete surfaces and paved surfaces. Rake clean other surfaces of grounds.
- P. Owner's responsibility for cleaning commences at Substantial Completion.

END OF SECTION

SECTION 01600

PRODUCTS AND INSTALLATION

1.01 GENERAL

- A. Attention is directed to General Conditions, Paragraphs 3.4 and 3.5, governing products and workmanship.
- B. If not specified otherwise, colors and finishes of specified products will be selected from manufacturer's standard ranges.
- C. Standards (ANSI, ASTM, Federal Specifications, etc.) referenced in specifications are latest edition as of date Contract Documents are issued for bidding. Where compliance with a standard is required, provide affidavit from sub-contractor or manufacturer certifying compliance, if requested by Architect.
- D. Design snow/wind load requirements: per Massachusetts Building Code, if not otherwise specified elsewhere in Contract Documents.

1.02 SUBSTITUTIONS

- A. Products of a particular manufacturer are generally specified either on an "or equal" basis, or with a list of acceptable alternative manufacturers.
- B. Submit proposals to provide products other than those specifically named in ample time before product is to be incorporated in Work, in order to allow for full investigation of proposal. Thoroughly document proposal with manufacturers' literature, shop drawings and samples, as appropriate and as requested by Architect.
- C. Contractor shall warrant as part of his request that proposed alternative product is comparable in size, operation, material, finish and quality to product specifically named. He shall further warrant that he will provide same warranty, as for product specified.
- D. Contractor shall be responsible for coordination of accepted substitution into Work and waives all claims for additional costs related to substitution which subsequently become apparent.
- E. Architect retains absolute right of approval of any proposed substitution, and may reject same on any grounds including appearance.

1.03 DELIVERY, STORAGE AND INSTALLATION

- A. Enclose products properly in containers, boxes, packages, etc, to prevent damage during transportation and handling. Deliver in original unopened containers with labels indicating brand names, model numbers, quality designations, fire-resistance ratings, etc.
- B. Store materials delivered to site off ground, under cover, in dry, well-ventilated locations secure from vandalism and theft, in full conformance with manufacturers' recommendations.
- C. Carefully protect stored materials from mechanical damage, dampness, and extremes of temperature. Provide separators between finished materials which are stored in stacked or leaning position.

D. Install, finish and clean products in strict accordance with applicable specification Section and with manufacturers' instructions, by skilled workmen under adequate supervision.

E. Make copies of manufacturers' installation instructions for all products available at job site. Foremen of installation crews shall have minimum of three years' experience installing that product.

C. Protect installed products until Substantial Completion by appropriate means, including plastic or canvas sheeting, kraft paper, masking tape and wood barricades. Remove name plates and other identifying markings from exposed surfaces of manufactured items installed in finished spaces, if requested by Architect.

1.04 CUTTING AND PATCHING

A. Refer to General Conditions and Section 02070 Selective Demolition, for cutting and patching at existing construction. Refer also to other specification Sections for cutting and patching requirements for specific materials.

END OF SECTION

SECTION 01700
PROJECT CLOSEOUT

1. RELATED DOCUMENTS

- A. This section supplements the General Conditions.
- B. Consult the individual sections of the specifications for specific items required under those sections.

2. SUBSTANTIAL COMPLETION

- A. Prior to requesting Substantial Completion as provided in the General Conditions the Contractor shall make a thorough inspection of the Work. During this inspection the Contractor shall prepare a comprehensive list of all items remaining to be completed or corrected. This list shall include all remaining Contractor and Subcontractor items to be provided under the Contract Documents.
- B. Upon completion of the items noted on the Contractor's list the Contractor shall notify the Architect that the Work is Substantially Complete. The Architect shall then conduct a similar thorough inspection. If the Architect agrees that the Work is Substantially Complete, the Architect will promptly make a thorough inspection and prepare a punch list, setting forth in accurate detail any items on the Contractor's list and additional items that are not acceptable or incomplete. The Contractor shall coordinate all Subcontractors to achieve prompt completion of the punch list.
- C. The Contractor shall not be relieved of the responsibility to provide Contract items left off of the Architect's punch list.
- D. If the Architect determines that the Work is not Substantially Complete, the Architect shall inform the Contractor of those items that must be completed before the Architect will prepare a punch list. Upon completion of those items, the Contractor shall again request the Architect to prepare a punch list.
- E. When the punch list has been prepared, the Architect will arrange a meeting with the Contractor and Subcontractors to identify and explain all punch list items and answer questions on work which must be done before final acceptance.
- F. The Architect may revise the punch list, from time to time, to ensure that all items of Work are properly completed.
- G. The Architect shall prepare the Certificate of Substantial Completion in accordance with the General Conditions.

3. RECORD DRAWINGS

- A. Record Drawings are not required for this project.

4. OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Consult the individual sections of the specifications for the specific requirements for those sections and for further details and descriptions of the requirements
- B. Prior to final payment and completion the Contractor shall provide all Operating Manuals and Maintenance Instructions as required by the Contract Documents.

5. FINAL COMPLETION

A. RELATED REQUIREMENTS

The Contractor's attention is directed to the General Conditions.

B. FULL RELEASE OF RETAINAGE

1. Upon completion of all work, and after receipt of all appropriate marked up As Built Drawings, Operating Manuals, Warranties, Guarantees, and Spare Parts required by the Contract Documents, the Architect shall prepare the Certificate of Final Completion.
2. The Contractor's signature on this Certificate shall be notarized.
4. The Contractor shall provide a final Application for Payment to complement the close-out process.

C. PARTIAL RELEASE OF RETAINAGE

1. If within 65 days after Substantial Completion, any of the items on the Architect's punch list are not complete or if the Contractor has not provided the appropriate marked up As Built Drawings, Operating Manuals, Warranties, Guarantees, or Spare Parts the Architect shall assign a monetary value for each incomplete item as well as any other items as provided by M.G.L. c.30 §39K, and the Architect shall prepare a Certificate for Partial Release of Retainage
2. If the Architect is required to prepare a Certificate for Partial Release of Retainage the Contractor shall complete all remaining Work in accordance with the provisions of the General Conditions.
3. The Contractor's signature on this Certificate shall be notarized.
4. The Contractor may make a request for additional releases of retainage when portions of the Work listed on the Architect's punch list have been satisfactorily completed. Each request shall be accompanied by a new application for payment and a new signed and notarized Certificate for Partial Release of Retainage.
5. The Architect's inspections, required to complete the additional payment applications described in subparagraph C4 above, are subject to provisions of the General Conditions.
6. Upon completion of all remaining items, the Final Release of Retainage shall be processed in accordance with paragraph B above.

END OF SECTION

SECTION 02070
SELECTIVE DEMOLITION

PART 1.00 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Contract and General Conditions and all Sections within Division 1, General Requirements, which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

B. Provide labor, materials, and equipment necessary to complete work of this Section, including but not limited to following:

1. Demolition and removal of portions of wood stud partitions and bearing walls.
2. Demolition and removal of floor structures, as shown on drawings.
3. Demolition and removal of brick masonry as shown on the drawings.
4. Removal of all doors, frames, fixtures and miscellaneous attachments specifically shown on plans or required for the correct installation of new work.
5. Demolition and removal of existing mechanical plumbing and electrical systems and equipment as specifically called for in mechanical and electrical Sections.
6. Cutting, patching, and repairs, except as specifically called for in other Sections.
7. Firestopping at miscellaneous wall and floor penetrations and openings.
8. Preparation and cleaning of existing surfaces, for work specified in other Sections.
9. Remove all miscellaneous equipment and furniture
10. See drawings for complete scope of work

C. Related work specified elsewhere:

1. Asbestos removal: (NOT INCLUDED)
2. Alterations to Existing Conditions: Section 01040
3. Temporary Facilities: Section 01500
4. Protection: Section 01510

1.03 SUBMITTALS

A. Refer to Section 01300, Submittals, for submittal provisions and procedures.

- C. Samples of each product specified.
 - D. Before beginning demolition work, submit demolition schedule to Architect for approval, including methods, sequencing, and provisions for disconnecting utility services.
 - E. Before beginning cleaning of existing surfaces, submit proposed cleaning methods to Architect for approval.
- 1.04 QUALITY ASSURANCE: Refer to Section 01600, Material and Equipment, for general provisions covering material delivery, storage, and installation.
- 1.05 RECORD DRAWINGS: Refer to Section 01700, Contract Close-out, for record drawing requirements.

PART 2 - PRODUCTS / EXECUTION

2.01 DEMOLITION AND REMOVAL OF EXISTING MATERIAL

- A. Contractor shall remove all existing trash, debris, and other loose material as part of his demolition operations.
- B. Demolition procedures:
 - 1. Provide shoring, bracing, and other support required to maintain integrity of existing structure and finishes during demolition operations. Provide platforms, lights, barriers, weather protection, warning signs, and other items required for proper protection of workers, public, and adjacent construction.
 - 2. Carry out demolition operations with utmost care to prevent excessive vibration, settlement, or other structural damage, or damage to existing finish materials scheduled to remain.
 - 3. Do not use cutting torches unless area is clear of flammable materials, particularly in concealed spaces. Maintain portable fire extinguishers during flame-cutting work. Comply with all Fire Department requirements.
 - 4. Protect unaltered portions of existing construction, including finishes, furnishings, and equipment, with dropcloths, dustproof partitions, etc. as required.
 - 5. Provide secure weather protection at temporary exterior wall openings, until such openings are closed.
- C. Carefully demount material designated to remain Owner's property, and store in location designated by Owner.
- D. Except as otherwise itemized in specifications or on drawings, all demolished material and equipment shall become Contractor's property and responsibility, and shall be removed from site by Contractor. Demolished material may not be re-used unless so noted elsewhere in Contract Documents.
- E. Demount and remove mechanical and electrical equipment, lines, fixtures, etc. in altered areas, which are not scheduled to be re-used, including when it is concealed from view and does not interfere with new construction (i.e. behind new walls, above suspended ceilings).

F. Demolition work shall be considered to be General Contractor's responsibility, except where noted for mechanical and electrical equipment.

2.02 CUTTING, PATCHING, AND REPAIRS

A. Cutting and patching provisions of Contract apply to both newly-installed and existing construction. Refer also to other specification Sections for cutting and patching requirements for specific materials.

B. Neatly patch and seal exposed-to-view openings, using sealants, tooled mortar joints, escutcheons, or flanged collars, as appropriate.

C. Whether or not called for specifically on drawings, patch, touch-up, and clean all existing walls, ceilings, and floors scheduled to remain, which are damaged by demolition, cutting, or removal of existing construction such as door frames, partitions, and equipment, or which are damaged during installation of new material.

D. Remove, cut, and patch work so as to minimize damage to existing elements. Use materials for patching which are of same types, sizes, qualities, and appearance as existing materials, or as specified for new work, as appropriate. Provide neat transition to newly-installed material. Where existing surfaces are cut so that a smooth transition is not possible, cut existing surface along natural division line, as determined by Architect.

E. Carefully remove, store, refinish, repair, and reinstall items shown on drawings to be reused or relocated. Neatly cut and trim such elements as required for reinstallation. Clean all relocated items after reinstallation, same as for new work.

F. Where existing construction must be cut, use powered core-drills or saws if possible; jack-hammering may be used only with Architect's permission.

G. Dimensions shown at existing construction represent best information available to Architect at time of design. Take field dimensions before factory-fabricating equipment which is required to fit closely into existing construction. No additional compensation will be paid for repairing or replacing items which do not fit into existing construction.

H. Wherever patching and repair work reveals damaged, deteriorated, or otherwise unsuitable material which could cause structural instability, or which cannot be resurfaced by normal methods, call Architect's attention to condition. Do not proceed with installation of new finish materials until damaged conditions are corrected.

I. Repair and replace existing exterior pavement and curbing damaged by construction, using materials matching existing. Saw-cut edge of existing pavement in a straight line, at a 45-degree angle to vertical, so that all existing loose or cracked areas of pavement are removed. Provide a smooth transition between new and old pavement.

Neatly cut (or saw-cut where shown on drawings) existing masonry walls for new door frames and other openings shown on drawings. Cut openings sufficiently large to allow for installation of anchors before patching. Installation of replacement masonry units is specified in Division 4 unit masonry Section.

D. Fire-stopping:

1. Seal openings in walls and floors to make a tight fit with penetrating items, using appropriate non-combustible filler material, to provide a minimum 2-hour rating.

2. Acceptable filler materials include:
 - Concrete
 - Cementitious proprietary product such as Zonolite Firestop ZF-I
 - Blanket-type mineral-fiber or ceramic-fiber insulation (glass-fiber insulation is not acceptable)
- Fire-resistant silicone sealant, such as Dow Corning Fire Stop Sealant or Hilti CS 240 Firestop Sealant
- Fire-resistant silicone foam such as Dow Corning RTV Foam Penetration Seal System or Hilti CB 120 Adhesive Filling and Sealing Foam
- Flexible intumescent strip wrapped around pipe penetrations, such as Dow Corning Fire Stop Intumescent Wrap or Hilti CS 2420 Intumescent Wrap

2.03 PREPARATION AND CLEANING OF EXISTING SURFACES

- A. Prepare and clean existing surfaces as required for installation of new materials, equipment, and finishes specified in other specification Sections.
- B. General:
 1. Remove materials such as existing floor materials paint, rust, adhesive, dirt, oil, wax, and sealers; which would prevent proper adhesion of new finish materials, from all surfaces scheduled for refinishing.
 2. Use scrapers, brushes, wire pads, detergents, chemical cleaning solutions, light sand-blasting, or other materials and equipment appropriate for surfaces being cleaned. Do not sand-blast exposed-to-view masonry.
 3. Clean test areas for Architect's approval before proceeding with complete cleaning operations.
 4. After cleaning is completed, completely brush or rinse off surfaces, in readiness for installation of finish materials.
- C. At previously painted or varnished surfaces, sand sound paint or varnish to a feather edge, and lightly sand entire surface.
- D. Remove loose, peeling material from surfaces which will be concealed from view but covered by new material installed on furring, strapping, or suspension system (e.g., acoustic ceiling, drywall).
- E. Concrete floors:
 1. Where existing concrete floor is being refinished remove any foreign materials such as dirt, oil, grease, paint, or curing compounds which would prevent proper bonding of new finish to substrate using soap or weak muriatic acid mixture, mechanical scarifying, or a light sand-blasting as required to obtain a "tooth" for adhesion. Treat dense, slick, or efflorescent surfaces similarly.
 2. Submit proposed floor preparation methods to Architect for approval before proceeding. Clean test areas for Architect's approval before proceeding with complete cleaning operations.
 3. After cleaning, thoroughly hose off all debris and preparation solutions with a high-pressure clean water rinse, and allow surface to dry completely.
 4. Refer also to separate Division 3 specification Section for concrete floor topping and slabs.

F. Remove mildew by scrubbing with solution of one cup non-ammoniated detergent, one quart household bleach, and one gallon of water. For stubborn mildew, add an extra quart of bleach to solution. Rinse surface with clean water and allow to dry completely.

G. Where existing clear-finished wood items are to be completely refinished, remove existing finish down to bare wood, using heat, liquid solvent, mechanical scrapers, or sanding as appropriate. Fill all nicks and dents with paste wood filler.

H. In addition to preparation work specified above, clean all existing windows and other glass (both faces) and all existing interior finished surfaces and equipment, which have not been altered but which remain exposed-to-view.

2.04 LEAD-BASED PAINT REMOVAL

A. **WARNING:** All existing paint shall be assumed to be lead-based.

B. Remove lead-based paint only where required by State Building Code requirements and public health regulations.

C. Take all necessary precautions to reduce health and safety dangers during removal of lead-based paint. Perform work per OSHA Publication 3126, "working with Lead in the Construction Industry", and state deleading regulations.

D. Following paragraphs are intended as a rough guide and shall not be construed to relieve Contractor of strict adherence to above-mentioned standards and regulations, as well as any other regulations in effect at time of construction.

E. Do not use a blow torch to remove lead-based paint. Workmen shall wear toxic dust respirators, and wash both skin and clothing after removing paint.

F. For solvent- and caustic-based strippers, workmen shall wear toxic vapor respirators, cotton-lined gloves, and full covering on arms and legs. Provide a source of water to flush strippers from skin.

G. Workmen shall wear safety goggles when using manual, mechanical, or fluid paint scrapers, sanders, or strippers.

H. Sweep or rake up dust and paint chips from dropcloths; scrape sludge into containers.

END OF SECTION

SECTION 02080

ASBESTOS ABATEMENT

PART 1 - GENERAL

1. SUMMARY OF WORK

The work of this Section includes the removal of asbestos-containing materials at the Joseph Simes House, 29 Manomet Point Road, Manomet, Massachusetts.

Pre-abatement activities include attendance at a pre-construction meeting, site inspection and filing of notifications, permits, and submittals.

All work shall be performed in a manner that protects the health and safety of the Owner's personnel, the Contractor's employees and all employees of other contractors and vendors at the site, Owner's Representatives, the general public and the environment.

All removal of ACM shall be performed within negative pressure work area containments with attached decontamination unit.

The Summary of Work Table in paragraph F below provides the scope of work for the removal of the asbestos containing materials, and includes the removal and disposal of non-ACM pressed wood covering the ACM flooring and all trash/debris in the work area.

The following table provides a summary of asbestos removal. A sketch of the work area location is included at the end of this section. The quantity of material provided in the summary of work table is an estimate only and shall be verified by the Contractor.

Summary of Work Asbestos Removal Joseph Sime House 29 Manomet Point Road, Manomet, Massachusetts			
Floor	Asbestos-Containing Material	Locations of Materials	Estimated Quantity
First	Red Flooring under pressed wood	On Porch	250 SF

SF = Square Feet

Filing of all notifications and obtaining of permits necessary to complete the work. All cost associated with required notifications and permit fees and all related costs shall be paid for by the Contractor.

Temporary electrical power and water for asbestos abatement will be provided by the General Contractor. All temporary electrical services shall meet applicable code and OSHA requirements for wet environments.

Provide adequate temporary lighting in all work areas including egress routes.

Provide and properly connect Ground Fault Circuit Interrupters (GFCI) for all temporary electrical service.

Provide all temporary connections, electrical cords, hoses, and water heaters, as required for abatement and air clearance sampling needs.

Related Sections include, but are not limited to, the following:

Section 01010 – Summary of the Work

2. DEFINITIONS

Abatement: Procedures to control the release of asbestos fibers from asbestos containing materials; includes removal, encapsulation, and enclosure of ACM.

ACM: Asbestos-containing material.

Adequately Wet: Sufficiently mixed or penetrated with liquid to prevent the release of particulate. If visible emissions are observed coming from the ACM, then that material has not been adequately wetted.

Air Monitoring: The process of measuring the fiber content of a known volume of air collected over a specified period of time. The NIOSH 7400 Method, Issue 2 is used to determine the fiber levels in air.

Air Intake: Any opening through which air is admitted to an air-handling system in a building.

Amended Water: Water to which a surfactant has been added.

Asbestos: Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered.

Asbestos Consultant: The Owner's industrial hygiene consulting firm and Project Monitor, TRC Environmental, 300 Wildwood Avenue, Woburn, Massachusetts.

Asbestos-containing material (ACM): Any material containing one percent or more asbestos of any type or mixture.

Asbestos-contaminated: Any material containing ACM coatings, dust, debris, or residue.

Authorized Visitors: Any visitor authorized by the Owner or any representative of a regulatory agency or other agency having jurisdiction over the project.

Clean Room: An uncontaminated room that is a part of the worker decontamination unit and in which worker's street cloths and protective equipment can be stored.

Competent Person: In addition to the definition in 29 CFR 1926.32(f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor.

Contractor: Refers to a Massachusetts DLS licensed Asbestos Contractor responsible for performing all of the work of this Specification section.

Critical Barriers: For the purposes of work area preparations, critical barriers shall include all doors, windows, vents, grilles, light fixtures, openings, immovable objects, and other sensitive components located within a regulated work area.

Decontamination Area/Unit: An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Employee Exposure: The exposure to airborne asbestos that would occur if the employee were not wearing respiratory protection equipment.

General Contractor: Refers to the Contractor responsible for the overall coordination of the Project, building renovation and the work of this Specification, as designated by the Owner.

Glove Bag: A manufactured plastic bag-type of enclosure with built-in gloves, which is placed with an air-tight seal around a facility component which permits ACM in or on the components to be removed without releasing asbestos fibers into the atmosphere.

HEPA Filter: High-Efficiency Particulate Air (HEPA). An air filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles sized 0.3 micrometer in diameter.

HEPA Vacuum: Vacuum equipment with HEPA filter system for filtering the exhaust air from the unit.

Negative Initial Exposure Assessment: A demonstration by the employer that complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL's.

Owner: Town of Plymouth, Massachusetts.

Owner's Representative: The Architect, Engineer, Construction Management Firm, Asbestos Consultant, and or Project Monitor.

Regulated Area: An established area where airborne concentration of asbestos fibers exceeds or can reasonably be expected to exceed the permissible exposure limit.

Removal: All herein-specified procedures necessary to remove asbestos-containing materials from the designated areas and to dispose of these materials at an acceptable site.

Waste Generator: Any owner or operator whose act or process produces asbestos-containing waste material.

Waste Shipment Record: The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

3. CODES, REGULATIONS, AND STANDARDS

General Applicability

All work under this contract shall be done in strict accordance with all applicable federal, state, and local regulations, standards and codes governing asbestos abatement, and any other trade work done in

conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this Specification.

The most recent edition of any relevant regulation, standard, document, code, or policy statement shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.

Copies of all standards, regulations, codes and other applicable documents, including this specification shall be available at the worksite.

The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State and Local regulations related to all aspects of the abatement project. The Contractor is responsible for providing and maintaining training, accreditation, medical exams, medical records, and personal protective equipment as required by applicable Federal, State and Local regulations. The Contractor shall hold the Owner and Owner's Representative harmless for any failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on the part of the Contractor, Contractor's employees, or subcontractors of the Contractor.

The Contractor shall comply with all applicable federal, state, and local laws, regulations, standards, and codes, including, but not limited to, those listed below. The following are applicable references and regulations, incorporated herein by reference:

Environmental Protection Agency (EPA):

- a. Title 40 CFR Part 763 Subpart E, Asbestos-Containing Materials in Schools (AHERA)
- b. Title 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP)
- c. Title 40 Part 761, Polychlorinated Biphenyls (PCBS) Manufacturing, Processing, Distribution in Commerce and Use Prohibitions

Occupational Safety and Health Administration (OSHA):

- d. Asbestos Construction Standard 29 CFR Part 1926.1101
- e. Asbestos General Industry Standard 29 CFR 1910.1001
- f. Lead in Construction 29 CFR 1926.62
- g. Respiratory Protection, 29 CFR 1910.134
- h. 29 CFR 1926 - Construction Industry Standards

U.S. Department of Transportation

- i. 49 CFR 171 and 172

National Institute for Occupational Safety and Health (NIOSH):

- j. "Respiratory Protection A Guide for the Employee."

American National Standards Institute (ANSI):

- k. Z86.1-1973 - Commodity Specification for Air
- l. Z9.2 - HEPA Filter Specifications.
- m. Z88.2-1980-Respiratory Protective Equipment

Massachusetts Department of Labor Standards:

- n. The Removal, Containment or Encapsulation of Asbestos (453 CMR 6.00), including all clarifications, policy statements, etc.

Massachusetts Department of Environmental Protection:

- o. 310 CMR 7.00, 7.09, 7.15 and all related amendments and policy statements.
- p. Amendments to Regulations 310 CMR 7.00, 7.09, 7.15 to Control Airborne Asbestos Emissions for the Control of Air Pollution.
- q. Hazardous Waste 310 CMR 30.

All applicable OSHA requirements and other federal, state, and local codes, laws, ordinances, regulations, and guidelines for asbestos removal and related work.

4. QUALIFICATIONS

The Contractor shall be licensed by the Massachusetts Department of Labor Standards (DLS) as an Asbestos Contractor.

All personnel of the Contractor or any approved subcontractors involved with asbestos abatement work shall meet the following minimum qualifications:

Current certification by the MA DLS as an asbestos supervisor or asbestos worker.

Medical examination within the past year in accordance with OSHA 1926.1101 with a physician's written opinion that the worker has no condition that would preclude him/her from working with asbestos or wearing a respirator.

The Contractor shall employ a Competent Person to oversee all aspects of ACM removal. The Competent Person qualifications shall be as follows: four (4) years of abatement experience of which two (2) years were as the Competent Person; meets the OSHA definition of a Competent Person; has been the Competent Person on two (2) projects of similar size and complexity as this project; has completed

EPA AHERA/OSHA/State training requirements/accreditation(s) and refreshers; and has all required OSHA documentation related to medical and respiratory protection.

There shall be a sufficient number of trained and qualified workers, foremen and superintendents to accomplish the work within the required schedule.

5. NOTIFICATIONS AND PERMITS

Obtain all necessary permits and provide notices as required to the following agencies:

Commonwealth of Massachusetts

(10 working days prior to start)

Asbestos Program

PO Box 120087

Boston, Massachusetts 02112-0087

Plymouth Fire Department

Plymouth Board of Health

The Contractor shall be responsible for payment of all required fees and to obtain all necessary permits prior to the start of work. Verification of notification and permits shall be submitted to the Owner.

Copies of all notifications and any revisions thereto shall be posted at the job site for the duration of abatement activities.

6. SITE SECURITY

Regulated area access is to be restricted to authorized trained/accredited and protected personnel. The Contractor's Competent Person shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel.

7. EMERGENCY PRECAUTIONS

Prepare a written site-specific Emergency Action Plan meeting all requirements of 29 CFR 1926.35. The Emergency Action Plan shall be submitted to the Owner's Representatives for review prior to commencing work at the job site.

Prepare a written site-specific Health and Safety Plan (HASP) meeting all the requirements of 26 CFR 1926.65. The HASP shall be submitted to the Owner's Representatives for review prior to commencing work at the job site.

8. RESPIRATORY SYSTEMS

The Contractor shall develop and implement a Respiratory Protection Program (RPP) that complies with the January 8, 1998 OSHA requirements, 29 CFR 1926.1101 and 29 CFR 1910.132 and 134. All respirators used must be NIOSH approved for asbestos abatement activities.

Minimum respiratory protection required shall conform to current OSHA and Massachusetts DLS regulations including 29 CFR 1926.1101 and 453 CMR 6.00.

9. WORKER PROTECTION

Prior to beginning any abatement activity, all abatement personnel shall be trained in accordance with OSHA 29 CFR 1926.1101 (k)(9). Training must include, at a minimum, the elements listed at 29 CFR 1926.1101 (k)(9)(viii). Training shall have been conducted by an EPA approved trainer meeting the requirements of EPA 40 CFR 763 Appendix C (AHERA MAP). Initial training certificates and current refresher and accreditation proof must be submitted for each person working at the site.

Medical examinations meeting the requirements of 29 CFR 1926.1101 (m) shall be provided for all personnel working in the regulated area, regardless of exposure levels. The physician's written opinion as required by 29 CFR 1926.1101 (m)(4) shall be provided for each person and shall include in the opinion that the person has been evaluated for working in a heat stress environment while wearing personal protective equipment and is able to perform the work.

Provide boots, booties, hard hats, goggles, clothing, respirators and any other personal protective equipment as determined by conducting the hazard assessment required by OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project.

Provide all required fall protection training and protective systems for all instances where work is performed at a height of 6-feet or more above a lower level.

The Competent Person shall ensure that each time workers enter the regulated area, they observe and follow all required procedures and wear appropriate personal protective equipment.

The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all requirements for regulated areas at 29 CFR 1926.1101 (e) are met. All personnel in the regulated area shall not be allowed to eat, drink, smoke, chew tobacco or gum, apply cosmetics, or in any way interfere with the fit of their respirator.

10. DECONTAMINATION FACILITIES

Provide the abatement area with a personnel and equipment decontamination facility decontamination facility (DF) located in an area agreed upon with the Owner's Representative and General Contractor. Construct walls and ceilings of DF to be airtight with a minimum of two layers of 6-mil fire retardant polyethylene sheeting. Install a minimum of two layers of 6-mil fire retardant polyethylene on floor of DF.

If work will be performed during winter months, Contractor shall maintain heated DF and changing facilities at a minimum temperature of 70°F.

All persons entering the work area shall follow the entry and exit procedures required by applicable regulations and these specifications. Process all equipment and material exiting the work area through the DF and decontaminate as required by these specifications.

The DF shall consist of three rooms that serve as three air locks as follows: Clean Room at entrance followed by Shower Room followed by an Equipment Room leading to the Work Area.

An Airlock is a system permitting unidirectional flow of air through the decontamination unit. It consists of two curtained doorways at least eight feet apart. Each curtained doorway shall be constructed by placing three overlapping sheets of plastic over a framed doorway, securing each along the top of the doorway.

The first and third sheet shall be secured on one side of the doorway and the middle sheet shall be secured on the other side of the doorway. Where size of work area permits, eight-foot distance between doorways is acceptable. Where size of work area is prohibitive, distance between doorways may be adjusted but must allow enough space for one doorway to be closed before the next doorway is opened.

Provide area for storage of street clothes of workers in the clean room. Provide in the same room, uncontaminated disposable protective clothing and gear to change into prior to entering the contaminated area. The clean room will be used to dress into street clothing after workers have showered and dried in the shower room as they exit from the contaminated area.

Provide shower room facilities with hot and cold water arranged to provide complete showering of workers and visitors as they exit from the contaminated area. Make provisions to prevent any contaminated run-off from the shower room. The shower room facilities and size shall be adequate to allow decontamination and thorough washing of all the workers and visitors within a ten minute period.

The hot and cold water shower shall be functional at all times while workers are within the work area enclosure. Water temperature shall be fully adjustable by the worker while standing in the shower basin.

Provide an Equipment Room with storage for contaminated clothing and equipment. In this room workers and visitors dispose of their disposable protective clothing except the respirator as they prepare to enter the shower room.

The DF area shall be equipped with the facilities necessary to wash and wipe the outside of drums or bags prior to removal from the site for transportation to a landfill. Make provisions to prevent any contaminated run-off from the bag wash room.

Provide leak proof wastewater collection system for PDF unit equipped with a water filtration system equipped with five-micron filter.

11. AIR FILTRATION DEVICES

Provide a suitable number of air filtration devices (AFDs) in the full containment work area to maintain a negative pressure in the work area relative to the adjacent non-work areas. The exhaust units shall be equipped with HEPA filtration and comply with ANSI Z9.2 standards. Fans for each unit should be sized to draw a desired airflow through the filters in the unit at a specified pressure drop. The unit shall have an air-handling capacity of 900 CFM to 2,000 CFM (under "Clean" filter conditions).

An adequate number of AFDs shall be installed for the work area enclosure to obtain the minimum number of air changes and to maintain adequate negative air pressure relative to adjacent building areas. Each unit shall be connected to a separate electric circuit, so that in case of an interruption of power in one circuit the remaining units will remain in operation. Make-up air entering the work area shall pass through the system.

The system shall be capable of delivering a minimum of one air change every fifteen (15) minutes. Fifteen-minute air changes are mandatory during removal of asbestos containing materials.

All AFDs shall be equipped with an operational alarm system capable of indicating when the unit is not working properly as required by 310 CMR 7.15 (7)(e)3.

Provide negative air filtration system in the work area to maintain a minimum negative pressure differential of at least -0.02 column inches of water within the contained work area. If negative air pressure of 0.02 inches is lost, work shall be halted until negative air pressure is restored.

Provide one automatic recording air pressure manometer per work area enclosure to monitor the pressure differential in a location acceptable to the Owner's Representative. The manometer shall continuously generate a permanent record dated daily, which shall be submitted to the Owner's Representative on a daily basis.

The air filtration system shall be operated on a continuous 24-hour basis from the commencement of the asbestos project process through final air clearance and containment dismantling. AFDs shall be operated in accordance with Appendix J of EPA Guidance Document EPA 560/5-85-024.

Exhaust air shall be HEPA-filtered before being discharged outside of the work area. Exhaust air tubes or ducts associated with the system shall be free of leaks. Air filtration devices shall be exhausted to the outside of the building. Provide and install secure window and door inserts as necessary for exhausting. If access to the outside is not available, exhaust air may be discharged to an area within the building provided that the area is unoccupied, contains no exposed or damaged asbestos, and is sampled and analyzed at least once per day per machine using the analysis methods prescribed by the NIOSH Method 7400.

Each AFDs HEPA filter shall be clean and also must be replaced if found to contain holes, tears, or other visible indications of damage. Pre-filters shall be replaced as needed during the project and if requested by the Owner's Representative. Used pre-filters shall be replaced with fresh filters prior to the AFDs removal from the work area.

12. CONTAINMENT BARRIERS

Physical barriers shall be constructed to restrict access to the regulated work area. Install solid rigid barriers (plywood or foil backed foam board supported by framing) at all large openings (such as open doorways, elevator doors and passageways) separating abatement work areas from adjacent building areas. Ensure that temporary barriers do not block egress to corridors, stairwells, etc.

Solid rigid barriers shall be placed over all openings to the regulated area. All cracks, seams and openings in the solid barriers shall be caulked or otherwise sealed. Seal off perimeter of work area to completely isolate abatement areas and to contain all airborne contamination created by abatement work.

Cover all surfaces in the work area with two layers of polyethylene sheeting 6-mil thickness taped securely in place with duct tape. Surfaces that will be removed during abatement do not require covering.

Enclose work areas with two layers of 6-mil thickness polyethylene sheeting on floors and two layers of 4-mil thickness polyethylene sheeting on walls.

Install two layers of 4-mil thickness polyethylene sheeting on all ceilings. Nonporous ceiling surfaces may be cleaned using wet wiping and HEPA vacuuming methods in lieu of covering.

The Contractor shall provide local exhaust ventilation in the work area to maintain a negative pressure in the work area relative to the adjacent non-work areas. The exhaust units shall be equipped with HEPA filtration and comply with ANSI Z9.2 standards.

Individually seal all heating and ventilation grilles, vents, diffusers, and other openings by installation of polyethylene sheeting barriers at least 6-mil in thickness.

13. DISPOSAL ACTIVITIES

The Contractor shall comply with current DOT, EPA, OSHA and MassDEP waste handling, transportation, and disposal regulations for the work site and for each waste disposal landfill.

Contractor and Contractor's waste transporter shall comply with all applicable regulations for states that waste is transported through and for states where waste is disposed.

Disposal of ACM shall be in a landfill authorized to accept ACM, operated in accordance with regulatory requirements of 40 CFR 61 (NESHAP) and applicable state and local regulations.

All ACM and asbestos-contaminated waste materials (ACWM) not containing components with sharp edges shall be containerized in two plastic bags (one inside the other – i.e., double-bagged) with each bag closed separately with a "goose neck" seal, or be placed in leak-proof metal, plastic or plastic lined drums with locking lids. ACM/ACWM with sharp-edge components (such as floor tile) shall be contained in leak-proof metal, plastic or plastic lined drums with locking lids or plastic lined boxes. Large components removed intact shall be wrapped in a minimum of two layers of six mil polyethylene sheeting with all joints and seams sealed with duct tape.

All containers used for the waste shall be labeled in accordance with federal, state, and local requirements prior to removal from the contained work area. The labels will contain the following information printed in letters of sufficient size and contrast so as to be readily visible and legible:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

In addition to the warning label requirement, each individual container will be labeled with the name of the waste generator, the location at which the waste was generated, and the date of generation.

Transport containerized ACM wastes through the building in covered bins.

The waste transporter shall have appropriate, current Department of Transportation (DOT) licenses and registrations and/or possess any other required licenses, registrations, or permits.

Provide EPA required Waste Shipment Record (WSR) for all ACM waste generated. WSRs signed by the landfill operator shall be provided to Owner within thirty days of the waste leaving the job site.

Waste Shipment Records shall be initiated for each load prior to any waste being removed from the job site. Provide a copy of each waste shipment record to the Owner's representative at the time the waste is transported from the job site.

All waste shall be transported in totally enclosed vehicles or containers that are designed, constructed, and operated to prevent spills, leaks, or emissions.

14. SUBMITTALS

Pre-Construction Submittals:

The following submittals shall be submitted to Owner and the Owner's Representative at least ten (10) business days prior to the start of asbestos removal work area preparation. Submittals shall be submitted to and approved in writing by the Owner's Representative prior to the Contractor receiving approval to begin work.

Certificates of training and documentation of medical examination including a physician's determination that the employee is able to wear a respirator and documentation of current successful respirator fit test (29 CFR 1926.1101 Appendix C) of all personnel assigned to the project, including Competent Person.

Certification of compliance with OSHA requirements including but not limited to medical surveillance, record keeping and personal monitoring.

Respiratory Protection Program. Include site specific exposure assessment for respirator selection for each phase of work where use of respiratory protection may be required, including, but not necessarily limited to:

1. **Preparation of work areas;**
2. **Gross removal of ACM (specify types);**
3. **Waste containerization, transport, and truck loading activities; and**
4. **Final cleaning of the work areas.**

A site-specific asbestos abatement plan. The abatement plan shall include, but not necessarily be limited to:

1. **A site drawing indicating the proposed phasing of work;**
2. **A site drawing for each work area indicating the proposed locations of rigid critical barriers, air filtration devices, AFD exhaust locations and information specified in paragraph 1.20(I), personnel decontamination units waste load out units, and routes that will be used to remove ACM waste from the building;**
3. **Methods and procedures for each type of ACM identified for removal;**
4. **Manufacturer's product information and MSDS sheets for all equipment and materials that will be used on the project, including, but not necessarily limited to polyethylene sheeting, duct tape, air filtration devices, decontamination equipment, water filtration, vacuums, amended water solutions, localized HEPA exhaust equipped tools, etc.**
5. **Waste disposal location(s).**

Current certification by the MA DLS as an asbestos removal contractor for the firm, and as a MA DLS certified asbestos supervisor or asbestos worker for each such employee working at the project site.

Liability Insurance Certificates, with this project listed and the Owner included as an additional insured.

Emergency Action Plan and Site-specific Health and Safety Plan.

Asbestos Notification Form ANF-001 and notification letters to the local fire department and board of health.

Material safety data sheets (MSDS) for all materials and products to be used by the Contractor on this project.

During Construction Submittals:

- Personal air sampling results for asbestos (posted daily at the site and made available for review).
- Waste shipment records for each load of ACM waste, and made available for review prior to the waste leaving the site.

Post-Construction Submittals:

- Waste shipment records signed by the waste generator, transporter and landfill operator demonstrating that the ACM removed from the project has been packaged, removed and disposed of properly.
- In addition, see Part 3, paragraph 17 for a full list of other documentation required to be provided as part of the Submittal.

PART 2 - MATERIALS AND EQUIPMENT

1. MATERIALS

Deliver all materials in original packages, containers or bundles bearing the name of the manufacturer.

Damaged, deteriorating, contaminated products or equipment shall not be used on this project, and shall be removed from the worksite and disposed of properly.

Polyethylene sheeting for floors and critical barriers shall be at least 6-mil thickness, shall be fire retardant and shall meet all applicable standards for temporary construction barriers.

Polyethylene sheeting for walls and ceilings shall be 4-mil thickness, shall be fire retardant and shall meet all applicable standards for temporary construction barriers.

All lumber shall be fire rated.

Duct tape or other waterproof tape, furring strips, spray glue, staples, nails, screws, or other materials shall be available to secure polyethylene sheeting.

Disposable bags and/or drums shall be of 6-mil polyethylene, on which labels are directly printed, as required by EPA and DOT regulations.

Asbestos warning signs that are posted at all approaches and/or entrances to work areas shall conform to OSHA 29 CFR 1926.1101.

All fire extinguishers required for the project shall be ABC class type, properly pressurized and in good working condition.

Adequately stocked first aid kits shall be on-site.

Surfactant (wetting agent) shall be prepared as specified by the manufacturer.

Penetrating Encapsulant shall be a color tinted high solids product approved for asbestos encapsulation by the manufacturer. Approved products include ABC Asbestos Fiberspray by Fiberlock Technologies; 32-60 Penetrating Encapsulant by Foster Products, or approved equal.

2. TOOLS AND EQUIPMENT

Scaffolding, Staging, Ladders and Lifts: All as required to accomplish the specified work, shall meet all applicable safety regulations.

Transportation Equipment: Transportation equipment, as required, shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without exposure to persons or property. The equipment shall be secured at all times and access restricted to authorized personnel.

Asbestos Vacuum Equipment: All vacuum equipment utilized in the work area shall utilize HEPA filtration systems, 99.97% efficient to 0.3 microns particulate size. Deliver all vacuums to the site with clean waste containers and new HEPA filters installed. Vacuum wands, brushes, hoses, and other accessories shall be delivered to the site new or if previously used shall be delivered to the site in airtight disposal bags.

Negative Air Filtration Devices: Asbestos filtration devices shall utilize high efficiency particulate air (HEPA) filtration systems, 99.97% efficient to 0.3 microns particulate size.

The Contractor shall provide approved respirators and protective clothing to all Contractor personnel, to representatives of the Owner, and to representatives of the State or other governmental entity who may inspect the jobsite.

Protective clothing requirements include:

One-time use, disposable, full-body coveralls made of Tyvek fabric or approved equal.

Hard Hats

Eye protection

Gloves – heavy-duty rubber gloves shall be used during flooring removal and cleanup activities.

Respiratory protective equipment in accordance with OSHA 29 CFR 1926.1101 and 29 CFR 1910.134. Respirators shall be NIOSH/MSHA approved for protection against asbestos exposure. Dual cartridge respirators for both asbestos and organic vapors shall be utilized during flooring removal activities using solvents.

The Contractor shall have sufficient equipment to mix and spray wetting agents.

The Contractor shall have a sufficient quantity of scaffolding, ladders, platforms, hand tools, and materials to conduct the abatement project in an efficient and workmanlike manner. All equipment shall be used according to OSHA Safety and Health Standards for the Construction Industry (29 CFR Part 1926).

All electrical cord and connections within all work areas shall be protected with ground-fault circuit interrupters (GFCI).

Water filtration devices for decontamination showers and equipment washing shall be equipped with 5-micron filters for decontamination and waste loadout units. All water filtration devices shall be leak-tested prior to use.

PART 3 - EXECUTION COORDINATION AND SCHEDULING

The Contractor shall coordinate all work with the Owner's representatives and the General Contractor.

1. WORK AREA ISOLATION

Post asbestos warning signs at each potential entrance to each work area. Security procedures shall be established to ensure that only authorized persons are allowed in the regulated areas.

Prior to any asbestos related work in an area, seal off the entire area to anybody other than trained personnel and authorized visitors.

Seal all openings, including but not limited to windows, doors, ventilation openings, drains, grills, and grates with six mil polyethylene sheeting and duct tape.

Maintain a written log of all persons entering and exiting the workplace.

2. PRECLEANING OF WORK AREAS

Remove and properly dispose of all moveable objects, trash and debris, including the pressed wood floor covering the ACM flooring.

3. WORK AREA PREPARATION

Seal all critical barriers to the work area(s) using two layers of 6-mil thickness fire-rated polyethylene sheeting secured with duct tape.

Construct temporary barriers using solid rigid materials supported by adequate framing to isolate the work area from all other building areas. Ensure that temporary barriers do not block egress to corridors, stairwells, etc.

Install three-stage decontamination facilities for workers. The minimum dimensions for each stage of the decontamination unit shall be 9 square feet. Shower units shall contain a minimum of one (1) shower head having both hot and cold water adjustable at the shower by the worker.

All temporary enclosures shall be constructed with fire retardant lumber. The decontamination units shall be constructed of 2"x 4" (nominal) framing and ½" plywood.

Emergency egress exits shall be constructed from the work area and shall be clearly marked.

Seal each window with two layers of 6-mil polyethylene sheeting.

Install HEPA-filtered AFDs sufficient to provide a minimum of one air exchange every 15 minutes and to maintain a minimum of -0.02 inches water column negative air pressure differential within the regulated work area during all phases of abatement. Negative pressure work area containments shall be provided for all interior asbestos removal work.

All air filtrations devices shall be exhausted to the outdoors. Provide and install secure inserts for exhausting through existing windows and/or doors.

Provide all necessary connections for temporary utilities in the workplace during abatement work. Temporary electrical power shall meet or exceed OSHA requirements.

Provide temporary lighting throughout work areas and all decontamination areas.

Install 2 layers of 4-mil thickness polyethylene sheeting on all wall surfaces, and secure with duct tape. Wall coverings shall extend from ceiling to floor and overlap the up-turned floor coverings without protruding onto the floor.

Install 2 layers of 4-mil thickness polyethylene sheeting on ceilings, except for ceilings that will be decontaminated during abatement, and secure with duct tape.

Install amended water system, automatic mister units, low pressure power washers, etc. as needed to provide sufficient wetting of materials and constant misting of the work area.

Remove all moveable objects from the regulated work area. Non-moveable or fixed objects shall be protected by covering with two layers of 6-mil thickness polyethylene sheeting and completely sealed with duct tape.

Request pre-abatement inspection by Asbestos Consultant and correct all deficiencies noted during the inspection.

4. WETTING REQUIREMENTS

Spray all materials to be removed with water containing a wetting agent. All ACM and contaminated materials to be removed shall be adequately wetted prior to removal. Once removed, ACM shall be kept adequately wet until and after it is placed in proper waste containers for disposal.

The wetting agent shall be 50 percent polyoxyethylene ether and 50 percent polyoxyethylene ester, or the equivalent mixed one ounce to five gallons of water.

Apply a low pressure fine spray of the amended water to minimize fiber release. Saturate sufficiently the material throughout the removal process so that there will be at no time of removal fiber release from dry asbestos. Do not use amended water in misting devices to avoid inhalation of aerosolized surfactant.

5. ASBESTOS REMOVAL

Personal protective equipment, including head, hand, foot, and eye protection, respirators, and disposable protective clothing shall be used at all times by workers performing removal.

Minimum personnel protective equipment for workers performing removal of friable surfacing and thermal insulation materials shall be disposable full body coveralls, rubber boots, eye protection, and full-face powered air purifying respirators equipped with P-100 filters, unless a greater level of protection is required.

The Contractor shall perform removal of all asbestos-containing materials using full containment negative pressure asbestos abatement work area enclosures.

The Contractor shall ensure all necessary electrical, mechanical, and plumbing disconnects, drain downs, and make-safe are performed prior to the start of abatement.

Designate at least one outside work area person to be stationed at the decontamination unit entrance at all times while persons are inside the work area enclosure. The outside person shall be in direct voice or radio contact with the inside work area supervisor or foreman.

Remove all ACM materials and debris using wet methods and containerize promptly.

Clean regulated area by HEPA vacuuming and wet wiping to remove all visible dust and debris.

6. CLEAN UP OF ASBESTOS WASTES AND HOUSEKEEPING REQUIREMENTS:

Immediately following removal, the wetted materials shall be packed into properly labeled 6-mil thickness double polyethylene disposal bags or polyethylene lined drums.

The Contractor shall not allow the removed material to accumulate prior to being containerized. In no instances shall the Contractor fail to containerize all materials including debris prior to the shift breaking for lunch, or at the end or change of a shift. Prior to beginning removal in a new area, all previously removed materials shall be containerized.

Completely clean/decontaminate the substrate and/or affected surfaces using scour pads, nylon brushes, wet wiping, and HEPA-vacuum cleaning methods and contain waste appropriately.

All waste containers shall be cleaned in the equipment decontamination unit prior to removal from the work area.

Cleaning methods utilizing compressed air, air stream from leaf blowers, or similar dry cleaning methods are strictly prohibited.

All used plastic, tapes, cleaning material and clothing shall be treated as asbestos waste material.

7. ALTERNATIVE PROCEDURES

The Contractor shall at all times use the procedures described in this Specification section, except as noted below in paragraphs 8(E) through 8(H) where applicable and permitted by Asbestos Consultant.

If the specified procedures cannot be utilized, the Contractor shall notify the Owner, in writing providing details of the problem encountered, and recommending alternative procedures, and requesting the Owner's permission to follow the alternative procedures.

Alternative procedures shall provide to all personnel, the Owner's property and to the environment, protection equivalent or greater than that provided by procedures that they replace.

Alternative procedures must be approved in writing by the Owner prior to implementation.

Abrasive blasting (and grinding) may be used to remove floor tile and mastic provided the work is conducted under full containment and uses the traditional wet removal methods in compliance with 310 CMR 7.15(7).

Floor mastic can be removed using liquid mastic chemical solvents (in full containment) provided that the Contractor obtains written permission from the Owner and General Contractor, as stained concrete cannot be recycled.

Covering of ceiling surfaces is not required if they are of such materials that they can instead be cleaned and decontaminated by wet wiping and HEPA vacuuming to the satisfaction of the Asbestos Consultant. Ceilings with porous surfaces cannot be adequately cleaned and must be covered. Suspended ceiling tiles and systems are not considered to be airtight and must also be covered.

Covering of floors and walls is not required where they are covered by ceramic tiles or other impervious materials that are free from holes, drains, cracks, fissures or other openings and which may be thoroughly decontaminated by washing at the conclusion of the work, provided that such action does not result in the passage of asbestos fibers from the work area.

8. AIR MONITORING DURING ABATEMENT

Contractor is responsible for meeting OSHA requirements for his employees, including but not limited to, monitoring requirements, safety compliance training and record keeping.

Personal monitoring results from the previous day shall be posted each day, and copies of the results forwarded to the Asbestos Consultant.

The Asbestos Consultant may collect air samples during the project for PCM analysis. If the result of any air sample collected outside of a work area is 0.010 f/cc or greater, the Contractor will be required to isolate and clean the affected area.

9. FINAL DECONTAMINATION

After the removal of the asbestos has been completed and before removal of critical barriers and engineering controls, all waste containers shall be removed from the work area and the entire area shall be thoroughly wet cleaned and vacuumed with HEPA filtered vacuums.

Obtain the Asbestos Consultant's approval for removal of non-critical barriers from floors and walls. Following removal of non-critical barriers from floors and walls perform additional cleaning of the entire work area using wet cleaning and/or HEPA vacuuming methods.

All reusable contaminated equipment such as respirators, hard hats, etc., shall be thoroughly decontaminated by wet cleaning. The Contractor shall not start containment dismantling operations until the Contractor has received written approval from the Asbestos Consultant.

After the decontamination levels specified have been confirmed through the final visual inspection and air clearance testing specified herein, the polyethylene enclosure shall be removed, the exposed surfaces thoroughly wet cleaned and/or HEPA vacuumed, and the plastic, tape, material from equipment room and shower room bagged and disposed of as asbestos waste.

10. VISUAL INSPECTION OF WORK AREAS

Notify the Asbestos Consultant a minimum of one business day in advance of the completion of all final cleaning activities and removal of all waste from the work area.

The Asbestos Consultant will visually inspect the workspace for the detection of any visible dust, debris or contamination.

Provide all necessary support for final visual inspection of the work area and final air clearance testing. Support shall include providing all necessary temporary lighting, electrical power, and decontamination facilities.

After successful visual inspection of the entire work area, the Contractor may apply a lockdown encapsulate to all surfaces within the work area, provided such coating is approved by the Owner and Owner's Representative.

11. FINAL AIR CLEARANCE TESTING

Final air clearance testing will be performed by Asbestos Consultant after a sufficient drying period has elapsed and work area surfaces are sufficiently dry.

Final air clearances following removal in work area will be conducted using phase contrast microscopy (PCM).

Final air clearance limits by PCM shall be when the concentration in each of the air samples collected is less than or equal to 0.010 fibers per cubic centimeter of air.

If the final air clearance testing results exceed the clearance criteria or are overloaded, then the Contractor shall perform additional cleaning of the work area and final air clearances shall be repeated. All costs associated with the collection and analysis of repeat clearance air samples due to elevated clearance fiber levels or excessive filter particulate loading shall be paid for by the Contractor.

The Contractor shall not start containment dismantling operations until the Contractor has received written approval from the Asbestos Consultant.

12. RESPONSIBILITY FOR DAMAGES

Any damages to the building and grounds that has been the result of actions by the Contractor personnel shall be repaired to their original condition without any additional cost to the Owner.

13. EXTENT OF REMOVAL

Contractor shall conduct all site investigations necessary to become familiar with the actual site conditions and efforts that will be required to perform the asbestos removal and related work required by this Section.

14. GENERAL APPLICABILITY OF CODES, REGULATIONS, LAWS AND STANDARDS

Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, laws and standards have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith.

15. CONTRACTOR RESPONSIBILITY

The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, packaging, transportation and disposal of asbestos contaminated materials, and protection of workers and visitors to the site, and persons occupying areas adjacent to the site. The Contractor shall hold the Owner's representatives harmless for failure to comply with any applicable work, packaging, transportation, disposal, safety, health or other regulation on the part of himself, his employees or his subcontractors.

15. CONTRACT CLOSEOUT

Contractor shall provide the Owner with a close-out package that shall include, as a minimum, the following documentation:

Completed Waste Shipment Records for all ACM waste;

DLS certifications for all workers and supervisors;

EPA training accreditation for all workers and supervisors;

Evidence of Annual Medical Surveillance for workers and supervisors;

Copies of daily field logs (sign-in/out) and negative pressure differential recordings for each work area;

Copies of any accident reports associated with the project;

Copies of any regulatory citations/notices issued to the Contractor associated with the project; and

Copies of personnel exposure monitoring for asbestos associated with the project.

END OF SECTION

SECTION 02100

GENERAL REQUIREMENTS FOR EXTERIOR IMPROVEMENTS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division General Requirements, apply to the work of this Section.
- B. Examine all other Sections of the Specifications for requirements that affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all under the Contract.

1.2 ACCURACY OF DATA

- A. Site data given herein and on the Drawings are as exact as could be secured, but their absolute accuracy cannot be guaranteed. Exact locations, distances, elevations, etc., shall be finally governed by field conditions and the Owner's representative instructions.

1.3 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. All work and materials shall conform to the latest applicable sections under the State of Massachusetts various jurisdictions (including the Massachusetts Historical Commission and the Massachusetts Department of Transportation's, Standard Specifications, hereinafter referred to as the "Standard Specifications", as well as the codes and standards referenced in the individual sections. In case of conflict, the codes and standards referenced in the individual sections shall govern.
 - 2. All work and materials also shall be in full accordance with the latest rules, regulations, and safety orders of state, county, city, municipality, and utility laws, rules and regulations. Nothing in these Drawings and Specification shall be construed to permit work not conforming to the above.
 - 3. When the Specifications call for material or construction of better quality or larger size than is required by the above-mentioned codes and standards, then the provisions of the Specifications shall take precedence over the requirements of said codes and standards. If there is any direct conflict between the above-referenced codes and standards and Drawings or Specifications, the codes and standards shall govern. Contractor shall furnish, without extra charge, any additional material and labor when required to comply with these codes and standards, even though the work is not mentioned in the Specifications or shown on the Drawings.

4. All new work shall conform to the most current Accessibility Guidelines as published in the legislation of the Americans with Disabilities Act.

1.4 EXAMINATION OF SITE

A. Prior to bidding, the Contractor shall thoroughly examine the site and the Contract Documents to ensure his/her knowledge of conditions and requirements affecting the work. No claim for extra compensation or extension of time will be allowed for Contractor's failure to comply with this requirement nor will any condition at the site, whether or not in agreement with conditions shown or called for on the Bid and Contract Documents, be allowed as a basis for such claims, except as otherwise specifically provided for.

1.5 DISCOVERY

- A. If during the demolition, excavation, disposal, or other work, articles of unusual value, or of historical or archaeological significance are encountered, the ownership of such articles is retained by the Owner's representative, and information regarding their discovery shall be immediately furnished to the Owner's representative. If the nature of the article is such that the work can not proceed without danger of damaging same, work in that area shall be immediately discontinued until the Owner's representative has decided the proper procedure to be followed. Any time lost thereby shall be a condition for which the time of the Contract may be extended. All costs incurred after discovery in the salvaging of such articles shall be borne by the Owner.
- B. In the event that historic features are uncovered during construction, the Contractor shall immediately cease operations and notify the Owner's Representative. The Contractor shall not resume operations without consent of the Owner's Representative.

1.6 COORDINATION WITH EXISTING UTILITIES

- A. The Contractor shall verify on site, the location and depth (elevation) of all utilities and services before excavation. He/she shall call the regional Dig-Safe number 1-800-322-4844, 72 hours prior to any excavation operations.
- B. The Contractor shall give all advance notice to public utility companies as required by law, and shall provide proper disposition, subject to the owner's representative approval of all existing pipe lines, conduits, sewers, drains, poles, wiring, and other utilities that in any way interfere with the work, whether or not they are specifically shown on the Drawings. The Contractor shall immediately notify the Owner and appropriate authorities when coming across an unknown utility line, and await decision as to how to dispose of same. When an existing utility line must be cut and plugged or capped, moved, or relocated, or has become damaged, he shall notify the Owner and the utility company involved, and assure the protection, support, or moving of utilities to adjust to the new work. The Contractor shall be responsible for all damage caused to existing, active utilities under the work of this Contract, whether or not such utilities are shown on the Drawings, including resultant damages or injuries to persons or properties.
- C. Agents of various public service agencies, municipal and state departments may be entering on the work site to remove existing facilities, to construct or place new facilities or to make alterations to existing facilities. The Contractor shall perform the work in cooperation with the various agencies in a manner that causes the least interference with the operations of the aforementioned agencies and shall have no claim for daily due to said work of these agencies.
- D. Written notice shall be given by the Contractor to all public service corporations or municipal and state officials owning or having charge of publicly or privately owned utilities of his/her intention to

commence operations affecting such utilities at least one week in advance of the commencement of such operations. The Contractor shall, at the same time, file a copy of such notice with the Owner's representative.

1.7 FIELD LAYOUT

A. Contractor shall establish benchmarks in at least two widely separated locations, and shall be responsible for correctly locating all lines and grades required for the construction of this Contract from the established reference points shown on the Drawings. The Contractor shall annotate project record documents to indicate all modifications of grades, utilities, etc.

B. Staking: **Contractor shall maintain a level and transit on the job, and shall employ personnel for use thereof trained and registered by the Commonwealth of Massachusetts as a licensed land surveyor or civil engineer to locate and stake out all proposed improvements.** The staked location and alignment of the improvements shall be checked and approved by the Owner's representative prior to any earthwork operations by the Contractor or his/her subcontractors. Acceptance or approval of the surveying by the Owner's representative will not constitute relief of Contractor's responsibility of accuracy.

C. Responsibility for Correctness: Contractor will be held responsible for the correctness of the layout and for establishing the location of buried utility lines. In the event there is any conflict between actual conditions and the Drawings, Contractor shall notify the Owner's representative immediately and shall not proceed with the work until directed by the Owner's representative.

D. Preservation of Markers: All stakes, boundary lines, corner markers, bench marks or survey markers, etc., which have been or may be established in any part of the site, shall be carefully preserved and respected by the Contractor and shall be restored at the Contractor's expense if lost or destroyed as a result of his/her operations.

1.8 PROTECTION OF PROPERTY AND THE PUBLIC

- A. Construct all fences, barricades, and protective facilities required for the protection of the public, in accordance with local and state regulations. Furnish and install all signs, lights, reflectors and all such protection facilities as may be required.
- B. Contractor shall hold the Owner harmless from all claims arising from the use of public streets, sidewalks and adjoining premises for construction purposes.
- C. Keep all access roads and walks clear of debris, materials, construction plans and equipment during construction. Repair streets, drives, curbs, sidewalks, fences, poles and the like where disturbed by construction, and leave them in as good condition after completion of the work as before operations started.
- D. The Contractor shall contact appropriate Town officials concerning hauling construction materials over Town roads and bridges.
- E. Provide ways and means to control flow of water from every source which may cause delay or damage during construction.
- F. The Contractor shall be responsible for the maintenance of construction barriers and traffic barriers in order to maintain traffic, over, through, or around the work included in his/her Contract with the maximum of safety and practicable convenience to such traffic during the life of the

Contract, and whether or not work has been suspended temporarily. He/she shall take all precautions for preventing injuries to persons or damage to property to or about the work.

- G. The work shall be carried out and barriers erected in such a manner as to provide safe passage at all times for public travel and with least obstruction to traffic. The Contractor shall provide and maintain, at his/her own expense, in a safe and passable condition, such temporary by-passes as created by the barriers as may be necessary to accommodate both pedestrian and vehicular traffic.
- H. The Contractor shall maintain all legally required means of egress.
- I. Where the new construction work coincides with the presently traveled way, the Contractor shall carry on his/her work so that travel will not be obstructed.
- J. Whenever gale or high winds are forecast, take proper measures to secure all loose material, equipment, or other items which could blow about and be damaged or cause damage to other work. No such loose items shall be left unsecured at the end of the working day.

1.9 POLICE

- A. Whenever, in the opinion of the Town, traffic is sufficiently congested or public safety is endangered, the Contractor shall furnish at his/her expense a uniformed police detail to direct traffic or to keep traffic off the area affected by construction operations. Such officers shall be in addition to flagmen required under other provisions of the Contract. The Contractor shall contact the Town of Plymouth Police Department at 508-830-4220 to review needs for police detail.
- B. The employment of traffic flagmen, or the presence of special officers or police shall in no way relieve the Contractor of any responsibility or liability which is his/hers under the terms of the Contract.

1.10 FIRE ACCESS

- A. The Contractor shall maintain fire lanes as required by the Town of Plymouth Fire Department throughout the course of construction.

1.11 SPECIAL SECURITY AND CONTRACTOR'S RESPONSIBILITY FOR THE WORK

- A. The Owner shall not provide security within the storage, staging, or construction areas nor will the Owner assume responsibility for acts of vandalism, within these areas.
- B. Until written acceptance of the physical work by the Owner's representative, the Contractor shall assume full charge thereof and he/she shall take every necessary precaution against damage to the work by action of the elements, or from any cause whatever, whether arising from the execution of the Contractor or not.
- C. The Contractor shall bear all losses resulting to him/her on account of vandalism.
- D. The Contractor shall rebuild, repair, restore and make good all damages to any portion of the work occasioned by any of the above causes before the completion and written acceptance of the physical work, and shall bear the expense thereof.
- E. Should the Contractor fail to take prompt action whenever conditions make it necessary, the Owner shall make emergency repairs or cause the same to be made, with the stipulation that the

costs for such repairs shall be charged against the Contractor and deducted from monies due to him/her.

- F. In case of suspension of work from any cause whatever, the Contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the project, provide for normal drainage and shall erect any necessary temporary structures, signs, or other facilities at his/her expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established plantings furnished under this Contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

1.12 TEMPORARY BRACING, SHORING, SHEETING, TIE DOWN

- A. Provide all sheeting, shoring, bracing, underpinning, reinforcement and other temporary supports as may be required to maintain the integrity of, and prevent damage to, any structure or finish to be subjected to or adjacent to construction work. Patch to restore to sufficient final strength, and acceptable appearance, subject to Owner's representative approval.

1.13 SITE DRAINAGE

- A. Contractor shall take over responsibilities for existing site drainage upon entering premises, and maintain such drainage during the life of his/her Contract in a manner approved by the Owner's representative and so as not to adversely affect adjacent areas.
- B. Keep excavations, pits, trenches and other construction areas free of water at all times, including backing up of drains and sewers. Provide hydraulic equipment to control surface and ground water. Pumping equipment shall be adequate to remove all hydrostatic pressure from structures until sufficient strength has been developed by the structure to protect work from displacement or other damage.
- C. Maintain ground water level where required sufficiently below excavation level at all times to maintain stable working platform. Ground water shall be controlled so as to avoid adverse effects or established ground water elevation of adjacent sites.

1.14 SITE TRENCHING AND EXCAVATION

- A. Open excavation adjacent to the traveled way or shoulders shall not remain through the hours of darkness, holiday or periods of shutdown, unless adequately protected and specifically authorized by the Town.
- B. If live service connections are to be interrupted by excavations of any kind, the Contractor shall not break the service until new services are provided. Abandoned services shall be plugged off or otherwise made secure.
- C. Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in protecting or repairing property as specified in this section, shall be considered included in the Contract price, and no additional compensation will be allowed therefore.
- D. Before starting any work for the Contract, the Contractor shall prepare and submit to the Owner's representative for approval, a plan which indicates the traffic routing proposed by the Contractor during the various stages and time periods of the work the temporary barricades, signs, cones, drums and other safety and traffic control devices to be employed during each stage and time

period of the work to maintain traffic and access to abutting properties.

- E. Particular care should be taken to establish and maintain methods and procedures which will not create unnecessary or unusual hazards to public safety. Traffic control and safety devices required only during working hour operations shall be removed at the end of each working day.
- F. Signs having messages that are irrelevant to normal traffic conditions shall be removed or properly covered at the end of each work period. Signs shall be kept clean at all times and legends shall be distinctive and unmarred.
- G. All trenches with the right-of-way in pavements to remain shall be hot-patched at the end of each work day as directed.
- H. All existing and other materials not required or needed for use on the project, and not required to be removed and stacked shall become the property of the Contractor and shall be removed from the site and legally disposed of. No separate payment will be made for this work, but all costs in connection therewith shall be included in the bid price of this Contract.

1.15 SEASONAL LIMITS

- A. No utilities shall be constructed or installed and no pavement or fill material shall be placed, spread, or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until field test by a soils engineer indicates that the moisture content and density of the fill are as specified in these Specifications, or are in condition suitable enough, in the opinion of the Owner's representative, for resuming the work.

1.16 COORDINATION

- A. Before commencing any work, or any phase of the work, the Contractor shall prepare a sequence of operations for all work under this division, and shall submit it for approval by the Owner's representative at a Pre-Construction Conference.
- B. Before commencing any work, the Contractor shall consult with the owner regarding any use of any facility, including, but not limited to, loading docks, parking areas, storage areas, etc., that may be required to prosecute the work.
- C. If, in the judgement of the Owner's representative, continued work under the approved sequence of operations may interfere with the operations of any other construction projects at any time during the progress of the work, the Owner's representative may direct the Contractor to accelerate, interrupt, or cease work at particular points. The Contractor shall make reasonable changes in the sequence of operations to accommodate these directions, at no additional cost to the Owner.
- D. The Contractor shall be responsible for the proper fitting of all work and the coordination of the operations of all trades, subcontractors, or material and equipment engaged upon the work. He/she shall be prepared to guarantee each of his/her subcontractors the dimensions which they may require for the fitting of their work to all surrounding work and shall perform or cause the subcontractors to perform all cutting, fitting, or adjusting and patching necessary to make the several parts of the work come together properly and to fit the work to receive or be received by that of other contractors.
- E. The Contractor shall give his/her personal supervision to the work or have a competent superintendent on the job at all times during the progress of the work, with the authority to act for

him/her. The contractor shall also provide an adequate staff for the proper coordination and expedition of his/her work.

- F. The Contractor shall lay out his/her work and shall be responsible for all lines, elevations and measurements of the grading, landscaping and other work executed by him/her under the Contract. He/she shall exercise proper precaution to verify the dimensions shown on the Drawings before laying out the work, and will be held responsible for any error resulting from his/her failure to exercise such precaution.
- G. The Contractor's responsibility for the coordinator of all work under the Contract shall be complete, and shall extend to all modifications in the work, whether or not such modifications entail a change in the Contract price. Where the Contract Documents allow an optional material or method, the Contractor shall provide all other coordination and additional work that such change necessitates, without any additional cost to the Owner.

1.17 MEASUREMENTS

- A. Before ordering any material or doing any work, the Contractor shall verify all measurements and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of difference between actual dimensions and the measurements indicated on the Drawings; any difference which may be found shall be submitted to the Owner's representative, in writing, for consideration before proceeding with the work.

1.19 CONDUCT OF WORK

- A. The Contractor shall coordinate with the Owner's representative, work in connection with adjacent occupied buildings or areas, driveways, walks or other facilities which would prevent access thereto or interrupt, restrict, or otherwise infringe upon the Owner's use thereof.
- B. Damage to existing work, if caused by Contractor's operations under this Contract, shall be repaired at Contractor's expense.
- C. The Contract limit shall be shown on Drawings, and shall include the entire area bounded by the "Limit of Work" lines when required for performance of work under this Contract.
- D. Any street or other paving, curbs, and/or sidewalks damaged as the result of work under this Contract, whether within or outside of the limits of the work, shall be repaired and/or replaced with new matching construction by the Contractor causing such damage, at his/her expense, in a manner satisfactory to the Owner's representative and authorities having jurisdiction thereover.
- E. Where existing curbs or walks are to remain, or after new curbs or walks are constructed and trucking is required over them, they shall be suitably protected in an approved manner.
- F. The Contractor shall provide continuous, lawful, safe, adequate and convenient access to the site. Access to the site shall generally be via existing roadways and paved surfaces which the Contractor shall maintain and restore to original condition. Contractor shall construct and maintain in good usable condition temporary roads or appurtenances as required, and when no longer required, remove temporary construction and restore such areas to their original condition.
- G. The Contractor and his/her sub-contractors shall not smoke inside the limit-of-work area, nor shall they sit on historic masonry or other features, including the Trask Memorial and associated masonry structures.

1.20 DISPOSAL OF MATERIAL

- A. Contractor shall properly dispose of all materials off-site in a manner consistent with all local, state and federal codes, regulations and policies.

1.21 CLEANING UP

- A. The following specific cleaning work shall be done:
1. Concrete and masonry shall be cleaned free of all foreign matter. If, in the opinion of the Owner's representative, further cleaning of specific areas is required, they shall be scrubbed with water or other cleaning agents. Acid cleaners shall not be used, except as may otherwise specifically be permitted in the trade sections.
 2. Surfaces with integral finishes shall be washed with clean water, mild soap and soft rags, thoroughly rinsed, and then wiped with clean, soft white rags. Abrasive cleansers shall not be used.
 3. Painted surfaces shall be cleaned free of all foreign matter, and if necessary, shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags thoroughly rinsed, and wiped with clean, soft white rags.
 4. Metal surfaces, hardware, equipment, and similar items shall be cleaned free of all foreign matter and, if necessary, shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags, thoroughly rinsed and wiped with clean, soft white rags. Abrasive cleaners shall not be used.
 5. All advertising matter and temporary instruction material shall be removed from exposed surfaces throughout.

END OF SECTION

SECTION 02101

SITE PREPARATION

PART I – GENERAL

1.1 GENERAL REQUIREMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division General Requirements, apply to the work of this Section.
- B. Examine all other Sections of the Specifications for requirements that affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all under the Contract.

1.2 SCOPE OF WORK

- A. Furnish all labor, materials, and equipment to properly complete the site demolition work shown or specified and as needed to properly complete the work of the Contract Documents, including:
 - 1. Removing and disposing of stumps, roots, rubbish, refuse, trash and debris within the indicated limits.
 - 2. Protection from injury to, or defacement of, any objects indicated or designated by the Owner's representative to be preserved, including the existing trees to remain.
 - 3. Removal, salvage, or other disposition of slabs and footings, existing pavement, curbs, sidewalks, steps, structures, fences, and site improvements which interfere with construction as indicated, or as required, by the Owner's representative.
 - 4. Coordination of disconnection and capping of utilities as needed.

1.3 RELATED WORK

- A. Section 02105 – Erosion Control.

1.4 QUALITY ASSURANCE

- A. Wherever possible, check conditions at the site before commencing work.
- B. Review construction procedures and sequence with Owner's representative to insure proper coordination with other work that would be affected by site clearing.
- C. Provide dust, noise and required control.

1.5 JOB CONDITIONS

- A. General: The Contractor shall visit and accept the site as he/she finds it, and shall inform him/herself of the character and the type of site items to be removed. The Contractor shall walk the site with the Owner's representative prior to commencing work to review the full scope of

demolition and items to remain. The Owner assumes no responsibility for the actual condition or structural adequacy of any existing construction to be demolished. Damage or loss to site improvements shall be at the risk of the Contractor from and after the date of Contract execution, and no such damage or loss shall relieve the Contractor of any obligation under the Contract.

- B. Disposal: Dispose of cleared, grubbed, and removed material off the site. Burning of materials on the job site will not be permitted. Stockpile salvaged material in a secured location, designated on the Drawings.
- C. Traffic: Conduct operations and removal of debris to ensure minimum interference with the normal use of public ways and other adjacent facilities. Do not close or obstruct traffic ways, streets, walks or other used facilities without the written permission of the Owner and authorities having jurisdiction.
- D. Protection: Existing facilities will be in use during site preparation and construction. Ensure the safe passage of persons in and around the area during demolition. Prevent injury to persons and damage to property. Immediately repair damaged property to its condition before being damaged.
 - 1. Shoring and Bracing: Provide adequate shoring and bracing to prevent uncontrolled collapse or damage to existing structures or utilities.
 - 2. Fire Protection: Maintain existing fire protection systems in operation throughout the work of this project or provide temporary equivalent protection.
- E. Prior to beginning any work of the Contract on site, take effective action to protect all existing landscape features to remain.
 - 1. Fences: Erect secure construction barriers, snow fencing, siltation fences and other barriers as needed to protect existing landscape features from damage. Erect secure traffic barriers between all disturbed areas and existing landscape features as indicated on the Drawings.
 - 2. Protection: Prevent the parking of vehicles, driving of vehicles, storage of materials, removal of soils, and stockpiling of soils within all active areas, except for work directly related to grading indicated.
 - 3. Utilities: Route utilities away from existing trees to remain even if shown otherwise. Minimize the cutting of tree roots, and when cutting is unavoidable, cut cleanly with a power saw and not an excavating machine.
- F. Dust and Noise Control: Take effective measures to prevent windblown dust and to control noise to avoid creating a nuisance. Avoid creating ice hazards in freezing weather.
- G. Utilities: Maintain all utilities except those requiring removal or relocation. Keep utilities in service and protect from damage. Do not interrupt utilities serving used areas without first obtaining permission from the utility company and the Owner. Provide temporary services as required.
- H. Protection of Existing Trees to Remain: Protect existing trees to remain against unnecessary cutting, breaking, or skinning of roots, skinning or bruising of bark, and smothering of trees by stockpiling construction materials within drip line. Also protect against excess foot or vehicular traffic. Parking of vehicles is not permitted within the drip line. Provide temporary guards to protect trees and vegetation to be left standing.

PART 2 – PRODUCTS

2.1 FACILITY PROTECTION

- A. Contractor shall walk the site with the Owner's representative to insure that the adjacent facilities been adequately protected during construction.

2.2 OTHER MATERIALS

- A. All materials to be selected by Contractor unless otherwise specified.

PART 3 – EXECUTION

3.1 DEMOLITION

- A. Demolish all existing above and below grade improvements except those indicated to remain. Wherever areas of new construction are shown to go over or encompass existing construction or improvements, it is intended for the existing construction and improvements to be completely removed in their entirety, unless specifically indicated to remain.

END OF SECTION

SECTION 02105
EROSION CONTROL

PART I – GENERAL

1.1 GENERAL REQUIREMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division General Requirements, apply to the work of this Section.
- B. Examine all other Sections of the Specifications for requirements that affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all under the Contract.

1.2 SCOPE OF WORK

- A. This Section specifies equipment and materials for an erosion and sediment control program for minimizing erosion and siltation during the construction phase of the project. The erosion and sediment control provisions detailed on the Drawings and specified herein are the minimum requirements for an erosion control program. The Contractor shall provide additional erosion and sediment control materials and methods as require to effect the erosion and siltation control principles specified herein.

1.3 RELATED WORK

- A. Section 02100, Site Preparation.
- B. Section 02200, Earthwork.

1.4 REFERENCES

- 1. Comply with applicable requirements of the MassDOT standards.

1.5 SUBMITTALS

- A. Proposed methods and materials to be employed, and schedule for effecting erosion and siltation control and preventing erosion damage shall be submitted for approval. Submittals shall include:
 - 1. Proposed methods for effecting erosion and siltation control including 1" = 20' plan indicating location of erosion control devices and siltation basins.
 - 2. List of proposed materials including manufacturer's product data.
 - 3. Schedule of erosion control program indicating specific dates from implementing programs in each major area of work.

1.6 EROSION CONTROL PRINCIPLES

- A. The following erosion control principles shall apply to the land grading and construction phases:

1. Stripping of vegetation, grading or other soil disturbance shall be done in a manner which will minimize soil erosion.
 2. Whenever feasible, natural vegetation shall be retained and protected.
 3. Extent of area which is exposed and free of vegetation and duration of its exposure shall be kept within practical limits.
 4. Temporary seeding, mulching, or other suitable stabilization measures shall be used to protect exposed critical areas during prolonged construction or other land disturbance.
 5. Drainage provisions shall accommodate increased runoff resulting from modifications of soil and surface conditions during and after development or disturbance. Such provisions shall be in addition to existing requirements.
 6. Sediment shall be retained on-site.
 7. Erosion control devices shall be installed as early as possible in the construction sequence prior to start of clearing and grubbing operations and excavation work.
- B. Cut and fill slopes and stockpiled materials shall be protected to prevent erosion. Slopes shall be protected with permanent erosion exposure period is expected to be greater than or equal to six months, and temporary erosion protection when erosion exposure period is expected to be less than six months.
1. Permanent erosion protection shall be accomplished by applying sod, or seeding with grass and covering with an erosion protection material, as appropriate for prevailing conditions.
 2. Temporary erosion protection shall be accomplished by covering with an erosion protection material appropriate for prevailing condition.
 3. Except where specified slope is indicated on the Drawings, fill slopes shall be limited to a grade of 3:1 (horizontal: vertical) and cut slopes shall be limited to a grade of 2:1.

PART 2 – PRODUCTS

2.1 SILT FENCE/EROSION CONTROL SOCK

- A. Contractor shall install erosion control devices as indicated on the Drawings in the form of a Silt Fence or Erosion Control Sock.
1. Silt fence shall be a wire-bound wood roll snow fence covered with filter fabric. Fence shall be 4 ft. high minimum, and shall have 3/8 in. by 1-1/2 in. wide pickets, approximately 2 in. apart. Bound together with at least 13-gauge minimum, galvanized steel wire.
 - a. Filter fabric shall be one of the following, or approved equal:

Product

TerraTex SF-90

Manufacturer

Hanes Geo Components
888-239-4539

or

Silt Fence
310 Professional Series

Cherokee Manufacturing, LLC
651-451-6568

- b. Silt fence shall be supported by steel posts, driven a minimum of 3 ft. into the ground. Posts shall be spaced 10 ft. o.c. maximum.

2. Erosion Control Sock shall be 12" min. diameter, manufactured by one of the following, or approved equal:

Product
Soxx

Manufacturer
Filtrexx Sustainable Technologies
440-926-2607

or

Silt Sock

Silt Sock Erosion Control Products, Inc.
608-438-7625

- B. Fencing/sock other than that specified above shall be subject to review and acceptance by the Owner's representative.

PART 3 – EXECUTION

3.1 SILT FENCE/EROSION CONTROL SOCK

- A. Silt fence/erosion control sock shall be constructed and installed as indicated on the Drawings and per manufacturers' recommendations (where applicable), prior to start of clearing and grubbing operations.

3.2 MAINTENANCE AND REMOVAL OR EROSION CONTROL DEVICES

A. Erosion Control Devices

1. Sediment behind the erosion control device shall be checked twice each month and after each heavy rain. Silt shall be removed if greater than 6 in. deep.
2. Condition of erosion control device shall be checked twice each month or more frequently as required. Damaged and/or deteriorated items shall be replaced. Erosion control devices shall be maintained in place and in effective condition.
3. Sediment deposits shall be disposed of off-site, in a location and manner which will not cause sediment nuisance elsewhere.

B. Removal of Erosion Control Devices

1. Erosion control devices shall be maintained until all disturbed earth has been paved or vegetated, at which time they shall be removed. After removal, areas disturbed by these devices shall be re-graded and seeded.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division General Requirements, apply to the work of this Section.
- B. Examine all other Sections of the Specifications for requirements that affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all under the Contract.

1.2 SCOPE OF WORK

- A. Perform all earthwork as shown on drawings and/or is incidental to the construction of the project, including all site grading.
- B. Contractor is responsible for calculating all cut and fill requirements to complete this project, as well as adding or hauling away material as needed.

1.3 RELATED WORK

- C. Section 02100, Site Preparation.
- D. Section 02105, Erosion Control.
- E. Section 02500, Pavement.
- F. Section 02900, Lawns and Planting.
- G. Section 03300, Cast-in-Place Concrete.

1.4 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
 - 2. MassDOT construction standards and specifications.
 - 5. Americans with Disabilities Act Accessibility Guidelines (ADAAG).
 - 3. Massachusetts State Building Code.
- B. The following abbreviations are included herein and shall mean:
 - 1. S.S.H.B. – Standard Specifications for Highways and Bridges.

2. A.S.T.M. – American Society for Testing and Materials.
3. A.A.S.H.T.O. – American Association of State Highway and Transportation Officials.

1.5 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. All topsoil, fill, and backfill material is subject to testing and inspection. Provide additional imported topsoil and fill as required to complete the work.
- B. On-site fill: Clean soil or soil-rock mixture free of foreign materials, organic material, and debris. Suitable excavated materials removed to accommodate new construction may be used for fill, subject to an acceptable soil engineer's approval.
- C. Imported fill: Clean natural clay subsoil, free of foreign matter, large rocks, organic material, and debris. Notify Owner's representative minimum 10 working days before using imported fill. Designate borrow area.
- D. Granular base: AASHTO M43, #6 (3/8" to 3/4") clean uniformly graded stone or gravel.
- E. Granular fill: AASHTO M43 #10, crushed stone or gravel. Grits not acceptable.
- F. Topsoil: Natural friable, fertile soil characteristic of productive soil in the vicinity, reasonably free of stones, clay lumps, roots, and other foreign matter.
 1. Proposed topsoil material shall be acceptable to the Owner's representative.
- G. Other materials required for proper completion of work: as selected by contractor and acceptable to Owner's representative.

PART 3 – EXECUTION

3.1 SITE GRADING

- A. Perform grading within contract limits, including adjacent transition areas, to new elevations, levels, profiles, and contours indicated. Provide subgrade surfaces parallel to finished surface grades. Provide uniform levels and slopes between new elevations and existing grades.
- B. Grade surfaces to assure areas drain away from structures and to prevent ponding and pockets of surface drainage. Provide subgrade surfaces free from irregular surface changes and as follows:

1. Rough grading: plus or minus 0.10ft. subgrade tolerance. Finish required will be that ordinarily obtained from either blade-grader or scraper.
2. Provide subgrade surface free of exposed boulders or stones exceeding 4" in greatest dimension in paved areas and 2" lawn and planting areas.
3. Fill all areas of settlement to proper grade before subsequent construction.
4. Lawn and planting areas: allow for 4" average depth of topsoil at lawn areas, and 12" depth at shrub and flower planting areas, except as otherwise indicated on the Drawings.
5. Paved areas: shape surface of subgrade areas to line, grade, and cross-section indicated. Provide compacted subgrade suitable to receive paving base materials. Subgrade tolerance plus 0, minus ½".
6. Granular base: grade subgrade surface smooth and even, free of voids to the required subgrade elevation. Provide compacted subgrade suitable to receive granular base materials. Tolerance ½" in 10'-0".

3.2 EXCAVATING

- A. Excavate for structures to elevations and dimensions shown. Extend excavation a sufficient distance from foundations to permit placing and removal of formwork, installation of materials, services, and inspection. Hand-trim foundation excavations to final grade just before concrete is placed. Remove loose, soft materials, and all organic matter. Footings shall bear on approved undisturbed bearing soil.
- B. Excavate for curbing, commemorative marker and cobblestone streambed foundations to elevations and grades indicated. Allow for base material.
- C. Earth excavation shall include the satisfactory removal and disposal of all materials encountered, regardless of the nature of the materials, the condition of the materials at the time they are excavated, or the manner in which they were excavated, except materials classified as rock excavation.
- D. Extra excavation: obtain written authorization from the Owner's representative before performing extra excavation work.

3.3 FILLING, BACKFILLING, AND COMPACTING

- A. Obtain inspection and approval of subgrade surfaces prior to filling operations. Scarify, dry and compact soft and wet areas; remove and replace unsuitable subgrade materials with and approved compacted fill material. Take corrective measures before placing fill materials. The Owner's representative shall assume no responsibility for subgrade suitability.
 1. Topsoil not permitted as fill or backfill material under paved areas.
- B. Soil stabilization: when exposed subgrade surfaces become spongy during construction operations and soil stabilization is required, stabilize subgrade materials as required. Soil stabilization will be paid for by the Contractor. Obtain soils engineer's written authorization before performing soil stabilization work. Soil stabilization will not be paid for as an extra change in work when it is a result of the Contractor's failure to perform proper drainage filling, backfilling, and compacting operations.

- C. Spread approved fill materials uniformly in layers not greater than 8" of loose thickness over entire fill area.
1. Topsoil not permitted as fill or backfill within structures limits or under paved areas.
 2. Lift thickness requirements may be modified by soils engineer to suit equipment and materials or other conditions when required to assure satisfactory compaction.
 3. Moisture-condition fill material by aerating or watering and thoroughly mixing material to obtain moisture content permitting proper compaction.
 4. Place and compact each layer of fill to indicated density before placing additional fill material. Repeat filling until proposed grade, profile, or contour is attained.
 5. Suspend fill operations when satisfactory results can not be obtained because of environmental or other unsatisfactory site conditions. Do not use muddy or frozen fill materials. Do not place fill material on muddy or frozen subgrade surface.
 6. Maintain surface conditions which permit adequate drainage of rainwater and prevent ponding of surface water in pockets. When fill placement is interrupted by rain, remove wet surface materials or permit to dry before placing additional fill material.
- D. Place backfill materials in uniform layers not greater than 8" loose thickness over entire backfill area. Provide clean backfill materials, except where granular materials are indicated.
- E. Fill areas of settlement to proper grade before subsequent construction operations are performed.
- F. Compaction:
1. Provide compaction control for all fill and backfill.
 2. Compact top 12" of subgrade and each layer of fill or backfill material at paved areas to 100% of maximum dry density at optimum moisture content in accordance with ASTM D698 Standard Proctor Method or AASHTO T99 Moisture Density Test. Extend compaction at least 1'-0" beyond slabs-on-grade and paving.
 3. Compact top 6" of subgrade and each layer of fill material at lawns and unpaved areas to 90% of maximum dry density at optimum moisture content in accordance with ASTM D698 Standard Proctor Method or AASHTO T99 Moisture Density Text.
 4. Water settling, puddling, and jetting of fill and backfill materials as a compaction are not acceptable.
 5. Maintain moisture content of materials during compaction operations within required moisture range to obtain indicated compaction density.

3.4 FINISH GRADING

- A. Fine grade topsoil eliminating rough and low areas to insure positive drainage. Maintain levels, profiles, and contours of subgrades as shown on plans.

- B. Remove stones, roots, weeds, and debris while spreading topsoil materials. Rake surface clean of stones 1" or larger in any dimension and all debris. Provide surfaces suitable for soil preparation provided under lawn and planting work.
- C. Maintenance:
1. Protect finish graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and damaged areas.
 2. Where completed areas are disturbed by construction operations or adverse weather, scarify, reshape, and compact or required density.

END OF SECTION

SECTION 02205

EXCAVATION AND BACKFILL

1.00 GENERAL

- 1.01 References: General provisions of contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 WORK INCLUDED

- A. Under this section consists of furnishing and installing all temporary shoring, bracing and support and related work as required to perform the structural alterations to the existing structure as shown on the drawings and as specified herein. This shall include but not be limited to:
1. Excavation and backfill for structures, foundations, pads, utilities and walkways as and where shown on the Contract Drawings or as required to complete related items of work.

1.03 PROJECT CONDITIONS

- A. Protection: Ensure the safe passage of persons and traffic around the areas of earthwork. Provide sheeting, shoring, and bracing as may be required to support sides of excavation.
- B. Dust Control: Take effective measures to minimize and control windblown dust. Do not create ice hazards by water spraying in freezing weather.
- C. Erosion Control: Take effective action to control erosion and run off from site. Prevent siltation of drainage systems and pollution of waterways and waterbodies. Install erosion controls prior to beginning site clearing and earthwork. Provide temporary silt barriers as may be required to protect adjacent areas and water bodies from site erosion.
- D. Utilities: Locate all utilities and maintain and keep utilities in service and protected from damage, except utilities indicated to be removed or relocated. Excavate and uncover all utilities requiring work or service.
- E. Cold Weather Conditions: Protect subgrade and building foundations from freezing in cold weather. Do not backfill when temperatures are below freezing.

1.04 QUALITY CONTROL

- A. Soil Compaction Testing: ASTM D1557, Method C, one sample per lift of backfill.
- B. In-Situ Soil Condition Verification: Visual inspection of areaway footing bearing subgrade by structural engineer.
- C. Soil Materials: Provide standard gradation analysis of each soil used on the project.

2.00 PRODUCTS

2.01 SOIL MATERIALS

- A. Structural Fill: Provide gravel, sandy gravel, or gravelly sand free from organic material, loam,

trash, snow, ice, frozen soil, and other objectionable material and well graded within the following limits.

SIEVE SIZE	PERCENT FINER BY WEIGHT PASSING THROUGH
6 inches	100
No. 4	30-90
No. 40	10-50
No. 200	0-8

- B. Crushed Stone Drainage Fill Materials: Provide ¾ minus washed crushed stone drainage fill meeting the following gradation:

SIEVE SIZE	PERCENT FINER BY WEIGHT PASSING THROUGH
6 inches	100
¾ inches	90-100
½ inches	20-30
No. 4	0-5
No. 40	0-5
No. 200	0-5

3.00 INSTALLATION

3.01 EXCAVATION, BACKFILLING AND COMPACTION - GENERAL REQUIREMENTS

- A. Use appropriate equipment to avoid damaging adjacent paving, landscaping and structures while providing safe and efficient means for soil removal. Contractor shall be solely responsible for locating and protecting subsurface and overhead utilities before and during excavation.
- B. Shoring and Bracing: Slope excavations and provide shoring and bracing as needed to comply with requirements of all local requirements and standard, accepted practice.
- C. Dewatering and Drainage: Remove water from excavations by appropriate methods, and protect excavations from surface runoff.
- D. Moisture Control, Placement and Compaction of Backfill: Control moisture in subgrades and in fill materials, and compact all materials within 3% of optimum moisture content, to 95% of maximum density as determined by ASTM D1557, Method C. Place backfill in lifts of not more than 6".
- E. Disposal: Dispose of excess materials and materials which are not to be reused off-site in a legal manner. Do not remove topsoil without the permission of the Town of Dover.
- F. Cold Weather: Contractor shall be responsible for protection of earth materials, subgrade, and foundations from frost during excavation operations and shall submit protection plan to Architect for review. Do not place or compact fill when ambient air temperatures are below freezing or when the fill could freeze prior to compaction.

3.02 MONITORING AND PROTECTION OF ADJACENT STRUCTURES AND FOUNDATIONS

- A. Monitor and protect foundation of existing building during work. Stop excavation work (1) when bottom of footing is reached, (2) if loose, damaged, or deflected foundation construction is encountered, or (3) when excavation reaches proper depth as shown on the Contract Drawings. Upon stopping work, contractor shall notify Architect to arrange for inspection of subgrade conditions.

- B. Contractor shall be solely responsible for the repair of any damage to the existing structure that may occur due to his excavation work, and shall be solely responsible for all monitoring, shoring, and bracing to prevent damage from occurring.
1. Design and installation of all required temporary bracing and support to enable the necessary foundation excavation to proceed along the existing structure and walkways.
 2. Design and installation of all required temporary shoring and support to enable the reconstruction of exterior stairway and performance of exterior and interior masonry restoration, repair and/or alteration.
 3. Design and installation of all required temporary shoring, bracing and support to enable the specified building modifications for support of mechanical equipment.
- C. The contractor shall be solely responsible for all means and methods of construction employed on this project including all temporary bracing, support and protection of the existing Structure. Contractor shall retain the services of a Massachusetts registered professional structural engineer at his own expense where required to maintain safe and stable conditions on the project. Any sequences of work or methods indicated or implied in the contract documents are present only as assumptions on which the design of the permanent installations are based and are to be considered as a suggested option for review by the contractor.

END OF SECTION

SECTION 02210

TEMPORARY SHORING, BRACING AND SUPPORT

1.01 References: General provisions of contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 WORK INCLUDED

1. Under this section consists of furnishing and installing all temporary shoring, bracing and support and related work as required to perform the structural alterations to the existing structure as shown on the drawings and as specified herein.

A. The contractor shall be solely responsible for all means and methods of construction employed on this project including all temporary bracing, support and protection of the existing Structure. Contractor shall retain the services of a Massachusetts registered professional structural engineer at his own expense where required to maintain safe and stable conditions on the project. Any sequences of work or methods indicated or implied in the contract documents are present only as assumptions on which the design of the permanent installations are based and are to be considered as a suggested option for review by the contractor.

1.03 SUBMITTALS

A. Submit the following items to the Architect for review:

1. Drawings showing shoring, bracing, and temporary supports where required for all items of work.

1.04 QUALITY ASSURANCE

A. Comply with all referenced standards for the products employed.

2.01 MATERIALS AND PRODUCTS

A. Employ materials that are appropriate to the required tasks.

1. Concrete: 4000 psi at 28 days, slump shall be 5 inches plus or minus 1 inch.

2. Reinforcing Steel: ASTM 615 grade 60, deformed.

3. Dry-Pack Mortar: Non-shrinking, no slump, cementitious, non-shrink mortar, minimum strength: 2500 psi at 7 days.

4. Temporary Shores: Properly sized timber posts, struts, and wailers to be removed upon concrete placement.

5. Permanent (stay in place) Shores and Plates: Painted or corrosion resistant ferrous posts, struts, wailers, and plates, or similar members of masonry or precast concrete, or combination thereof.

3.01 DESIGN OF NEW TEMPORARY SHORING AND BRACING

- A. Field Survey and Analysis:
1. Select shoring, bracing and support locations and measure all existing geometry and note existing conditions. Locate points of attachment and support that will best suit progress of work.
 2. Perform a structural analysis of the areas to be affected by the work and determine loads on temporary shoring, bracing and support system.
- B. Design Shoring, Bracing and Support:
1. Shoring, bracing and support shall be designed to maintain existing lines and surfaces without deflection during work.
 2. Design shall be sufficient for existing and new material loads and anticipated construction loads.
 3. Design shall distribute loads to supporting structure and shall limit all movement to less than 1/16" at full loading. Stresses on supporting structure shall not exceed safe, commonly allowable stresses for the materials in consideration of their age and conditions. Bending members shall allow deflections of existing masonry and other elements of not more than their span lengths divided by 720 and 360, respectively, at full loading.
 4. Minimize use of side grain bearing timbers that may be susceptible to dimensional variations with changes in moisture and temperature. Seal all end grain.
- 3.02 Construction:
- A. Construct shoring, bracing and support in accordance with approved design submittal and proper and standard construction practice. Work shall be installed so as not to permanently mar or stain the exposed stone faces of the structure.
- 3.03 Maintenance:
- A. Maintain shoring, bracing and support in a safe condition during all phases of work. Keep wood generally dry and of constant moisture content. Protect wood from swelling or shrinking with weather and humidity fluctuations.
- 3.04 Removal:
- B. Remove all shoring and bracing after surrounding work is complete and masonry has adequately cured. Remove all temporary inserts and plug holes per applicable requirements of Section 04510 - Masonry Restoration and Reconstruction.

END OF SECTION

SECTION 02418

TRACER TAPE

PART 1 - GENERAL

1.1 WORK INCLUDED

This section covers the furnishing, handling and installation of tracer tape, as called for on the drawings.

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

- A. Six sets of manufacturer's literature on the materials, colors and printing specified herein, shall be submitted to the Engineer for review.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

Tracer tape shall be by Lineguard, Inc., Wheaton, IL; Empire Level, Waukesha, WI; Pro-Line Safety Products Co., W. Chicago, IL; or approved equal.

2.2 TRACER TAPE

- A. Tracer tape shall be at least 3-inches wide.
- B. Tracer tape for non-ferrous pipe or conduit shall be constructed of a metallic core bonded to plastic layers. The metallic tracer tape shall be a minimum 5-mil thick and must be locatable at a depth of 18 inches with ordinary pipe locaters.
- C. Tracer tape for ferrous pipe or conduit shall consist of multiple bonded plastic layers. The non-metallic tracer tape shall elongate at least 500% before breaking.
- D. The tape shall bear the appropriate wording such as: "BURIED DRAIN LINE BELOW", or approved equal, continuously repeated every 30 inches to identify the pipe.
- E. Tape colors shall be as follows, as recommended by the American Public Works Association (APWA):

Electric	Red
Gas & Oil	Yellow
Communication	Orange
Water	Blue
Sewer & Drain	Green
Chemical	Red (not APWA)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Tracer tape shall be installed directly above the pipe or conduit it is to identify, approximately 12 inches below the proposed ground surface.

- B. The Contractor shall follow the manufacturer's recommendations for installation of the tape, as approved by the Engineer.

END OF SECTION

SECTION 02424

HIGH DENSITY POLYETHYLENE PIPE

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. This Section covers furnishing, handling, laying, joining and installation of corrugated high density polyethylene pipe (HDPE) drainage piping, fittings and appurtenances.
- B. The Contractor shall furnish and install the pipeline and appurtenant work as indicated on the Contract Drawings and as specified herein, or as required to produce a complete, proper, and functional installation in accordance with the intent of these Contract Documents.

1.2 RELATED WORK

- A. Section 02071, GEOTEXTILE FABRICS
- B. Section 02300, EARTHWORK
- C. Section 02518, TRACER TAPE

1.3 QUALITY ASSURANCE

- A. All pipe and fittings shall be inspected and tested at the factory as required by the standard specifications to which the material is manufactured. The Contractor shall furnish in duplicate to the Engineer sworn certificates providing evidence of such tests.
- B. The Owner reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Owner's expense.
- C. Deflections in horizontal alignment shall not be permitted at joints without written consent of the Engineer. The corrugated pipe and fittings shall be free of foreign inclusions and visible defects. Ends shall be cut squarely and cleanly so as not to adversely affect joining.
- D. When requested by the Engineer the Contractor shall ensure that a qualified representative of the manufacturer shall be present at the job site for the first day of pipe laying, to assure that proper procedures are followed.
- E. The Engineer shall be notified in advance when the location of an existing pipeline conflicts with the proposed location of the Work.
- F. Pipe and fittings for corrugated pipe shall be products of a single manufacturer.
- G. All piping shall be of the type and size shown on the drawings and described in this section of the Specifications.

1.4 REFERENCES

The following standards form a part of this specification:

American Society for Testing and Materials (ASTM)

ASTM D2737 Polyethylene (PE) Plastic Tubing

American Water Works Association (AWWA)

AWWA C800 Underground Valves and Fittings

AWWA C901 Polyethylene Pressure Pipe, Tubing, and Fittings, ½-inch through 3-inch for Water Service

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Pipes and fittings shall be carefully handled when loading and unloading. Pipes shall be lifted by hoists or lowered on skidways in such a manner as to avoid shock.
- B. HDPE pipe shall be protected from exposure to sunlight. Such protection shall consist of canvas covering, or other material, as recommended by the manufacturer. Plastic sheets, which may allow excessive temperatures to develop where the pipe is stored, shall not be used.

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

Shop drawings shall consist of manufacturer's scale drawings or catalog cuts including descriptive literature and complete characteristics, specifications, and code requirements. Shop drawings shall be submitted for the HDPE pipe, type of joints, fittings, and couplings, in accordance with the specifications.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Pipe shall be homogeneous throughout; free from voids, cracks, and other defects; as uniform as commercially practicable in color, density, and other physical properties.
- B. Pipe surfaces shall be free from nicks, scratches, and other blemishes. The joining surfaces of pipe shall be free from gouges and other imperfections that could cause leakage at the joints.
- C. Fittings shall not reduce the inside open flow area of the pipe. Couplings shall be corrugated to match the corrugations of the oblong pipe and shall provide sufficient strength to assure alignment and prevent separation at the joints.
- D. All polyethylene fittings shall have a pressure rating equal to or higher than the pressure rating of the pipe.

2.2 HIGH DENSITY POLYETHYLENE (HDPE) DRAINAGE PIPE

A. GENERAL

- 1. Drainage pipe shall be HDPE pipe, type N-12, as manufactured by Advanced Drainage Systems, Inc. or approved equal.

2. The corrugated pipe shall have a minimum compressive strength of 3,000 lbs. at 20% deflection when tested in accordance with ASTM D2412 standards.
 3. HDPE pipe shall be joined to concrete structures with the use of non-shrink grout conforming to Section 03302, FIELD CONCRETE. Connections to flared end sections shall be secured with a poured collar of concrete encompassing the entire joint. The joint interior shall also be grouted with non-shrink grout. The resulting joint shall be soil tight.
- B. HDPE DRAINAGE PIPE – SOLID
1. Drainage pipe shall be corrugated, watertight, HDPE pipe, type - Standard Corrugated Pipe, as manufactured by Advanced Drainage Systems, Inc. or approved equal.
- C. HDPE DRAINAGE PIPE – PERFORATED
1. Drainage pipe shall be corrugated HDPE pipe, type - Standard Perforated Corrugated Pipe, as manufactured by Advanced Drainage Systems, Inc. or approved equal.
 2. Perforations by manufacturer shall be cleanly cut and uniformly spaced along both sides of the pipe.

PART 3 - EXECUTION

3.1 INSPECTION BEFORE INSTALLATION

- A. Each length of pipe and each fitting shall be carefully inspected prior to being lowered into the trench. All materials not meeting the requirements of these specifications, or otherwise found defective or unsatisfactory by the Engineer, shall be rejected and immediately marked and removed from the project site by the Contractor.
- B. Bedding, sub-bedding, and other trench conditions shall be carefully inspected prior to laying pipe. All conditions shall be made available to the Engineer for inspection.

3.2 PIPE INSTALLATION

- A. Pipe interiors, fitting interiors, and joint surfaces shall be thoroughly cleaned prior to installation. Pipes and fittings shall be maintained clean.
- B. Pipes shall be installed in the locations and to the required lines and grades shown on the drawings and provided in these Specifications, using an approved method of control.
- C. Excavations shall be maintained free of water during the progress of the Work. No pipes shall be laid in water, nor shall there be any joints made up in water.
- D. If any defective pipe is discovered after being placed, removal and replacement with sound pipe will be required at no additional cost to the Owner.

END OF SECTION 02424

SECTION 02431

PRECAST MANHOLES AND CATCH BASINS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers all precast manholes and catch basins complete, including, but not limited to, bases, walls, cones, mortar, inverts, frames and covers.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02500, PAVING
- C. Section 03300, CAST-IN-PLACE CONCRETE

1.03 SYSTEM DESCRIPTION:

- A. Precast sections shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings or as ordered by the Engineer.
- B. All manholes and catch basins shall have concrete bases. Concrete bases shall be precast unless otherwise specified. Invert channels shall be formed of brick and mortar upon the base.
- C. Catch basins shall have a 4-foot deep sump unless otherwise specified.
- D. Riser and cone sections shall be precast concrete.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM	A48	Gray Iron Castings
ASTM	C32	Sewer and Manhole Brick
ASTM	C144	Aggregate for Masonry Mortar
ASTM	C207	Hydrated Lime for Masonry Purposes
ASTM	C478	Precast Reinforced Concrete Manhole Sections
AS'IM	C923	Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
ASTM	C1244	Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M198 Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets

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

- A. Six sets of manufacturer literature of the materials of this section shall be submitted to the Engineer for review.
- B. Tests reports as required shall be submitted to the Engineer.

PART 2 - PRODUCTS

2.01 PRECAST CONCRETE SECTIONS:

- A. All precast concrete sections shall conform to ASTM C478 with the following exceptions and additional requirements:

- 1. The wall thickness of precast sections shall be as designated on the drawings, meeting the following minimum requirements:

Section Diameter (Inches)	Minimum Wall Thickness (Inches)
48	5
60	6
72	7
84	8

- 2. Type II cement shall be used except as otherwise approved.
 - 3. Sections shall be steam cured and shall not be shipped until at least five days after having been cast.
 - 4. Minimum compressive strength of concrete shall be 4000 psi at 28 days.
 - 5. No more than two lift holes may be cast or drilled in each section.
 - 6. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of each precast section.
 - 7. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.
 - 8. Circumferential steel reinforcement in walls and bases shall be a minimum of 0.12 sq. in./lin. ft. for 4-foot diameter sections and 0.17 sq. in./lin. ft. for 5 and 6-foot diameter sections. Reinforcing shall extend into tongue and groove.
- B. Conical reducing sections shall have a wall thickness not less than 5-inches at the bottom and wall thickness of 8-inches at the top. Conical sections shall taper from a minimum of 48-inches diameter to 24 or 30-inches diameter at the top, as shown on the drawings.
 - C. Except where insufficient depth of cover dictates the use of a shorter base, bases shall be a minimum of 4 feet in height.

- D. Slab top sections shall conform to the contract drawings, with particular attention focused upon the reinforcing steel.
- E. The tops of the bases shall be suitably shaped by means of accurate ring forms to receive the riser sections.
- F. Precast sections shall be manufactured to contain wall openings of the minimum size to receive the ends of the pipes, such openings being accurately set to conform with line and grade of the sewer or drain. Subsequent cutting or tampering in the field, for the purpose of creating new openings or altering existing openings, will not be permitted except as directed by the Engineer.
- G. The Engineer reserves the right to reject any unsatisfactory precast section and the rejected unit shall be tagged and removed from the job site immediately.
- H. The Engineer may also require the testing of concrete sections as outlined under Physical Requirements in ASTM C478 with the Contractor bearing all testing costs.

2.02 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. 117 general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; portland cement to hydrated lime to sand.
- D. Cement shall be Type II portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. The sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

2.03 BELL TRAPS, FRAMES, GRATES, COVERS AND STEPS:

- A. Castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.
- B. All castings shall be thoroughly cleaned and may be subject to a careful hammer inspection at the Engineer's discretion.
- C. All castings shall be manufactured in North America, ASTM A48 Class 30B or better.
- D. The surface of the manhole covers shall have a diamond pattern with the cast words "WATER," "DRAIN" or "SEWER," whichever is appropriate.

- E. Manhole frames with 26-inch covers for 24-inch openings shall be 471 pounds minimum by East Jordan Iron Works, Product 00211048A01 or approved equal.
 - F. Catch basin frames with 2-inch square openings and 23-7/8-inch square grates shall be 8-inches in height. They shall be East Jordan Iron Works, Products 0MA552000011 (Frame) and 00552031C02 (Grate) or approved equal.
 - G. Double Catch basin frames with 2-inch square openings and 23-7/8-inch square grates shall be 4-inches in height. They shall be East Jordan Iron Works, Products 00544411 (Frame) and 00552031C02 (Grates) or approved equal.
 - H. Catch basin frames set against curbing shall have three flanges only.
 - I. Manhole steps shall conform to ASTM C478 requirements and shall be fabricated of either extruded aluminum or steel reinforced plastic. Steps shall be uniformly spaced at a maximum of 12-inches unless otherwise shown on the drawings.
 - J. Catch basin bell traps shall be "The Eliminator" manufactured by Ground Water Rescue, Inc., "Snout" manufactured by Best Management Products, Inc., or approved equal.
- 2.04 SEWER MANHOLE ACCESSORIES:
- A. Gasket materials shall be top grade (100% solids, vulcanized) butyl rubber and shall meet or exceed AASHTO M-198.
 - B. Couplings at the manhole-pipe interface shall be made with a rubber seal system (with or without stainless steel straps) meeting the requirements of ASTM C923 and recommended for this type of connection.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. PRECAST SECTIONS:

1. Precast bases shall be supported on a compacted level foundation of crushed stone, as specified in Section 02300 EARTHWORK, at least 6-inches thick, but shall vary to the depth necessary to reach sound undisturbed earth.
2. Precast reinforced concrete sections shall be set vertical and with sections in true alignment.
3. Butyl rubber joint sealant shall be installed between each concrete section. Catch basin sections do not require joint sealant if so indicated on the drawings.
4. All holes in sections used for handling the sections shall be thoroughly plugged with mortar. Mortar shall be one part cement to 1-1/2 parts sand, mixed slightly damp to the touch (just short of "balling"), hammered into the holes until it is dense and an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces. All mortar shall be non-shrink.

B. BRICK WORK

1. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.

2. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as directed.
3. The brick inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipe.

C. CASTINGS:

1. Cast iron frames, grates and covers shall be as specified. The frames and covers shall be set by the Contractor to conform accurately to the grade of the finished pavement, existing ground surface, or as indicated on the drawings. Frames shall be adjusted to meet the street surface.
2. Cast iron manhole frames and covers not located in paved areas shall be set 6-inches above finished grade, at a height as directed by the Engineer, or as indicated on the drawings. The top of the cone shall be built up with a minimum of 1 course and a maximum of 5 courses of brick and mortar used as headers for adjustment to final grade.
3. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.
4. Covers and/or grates shall be left in place in the frames, for safety reasons, except while work is being performed.
5. The Contractor shall deliver removed frames, covers, and grates to a location of the Owner's choice within the Town at no cost to the Owner.

D. ACCESSORIES:

Accessories shall be installed in accordance with manufacturer's instructions.

3.02 CLEANING:

All new structures shall be thoroughly cleaned of all silt, debris and foreign matter of any kind, prior to final inspection.

END OF SECTION

SECTION 02500

PAVEMENT

A. PART I – GENERAL

1.1 GENERAL REQUIREMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division General Requirements, apply to the work of this Section.
- B. Examine all other Sections of the Specifications for requirements that affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all under the Contract.

1.2 SCOPE OF WORK

- A. Provide all labor, equipment, implements and materials required to furnish, construct and perform all curbing, step, paving, and surfacing work complete as shown on the Drawings and specified herein. Work includes:
 - 1. Providing gravel bases for pavement.
 - 2. Installing bituminous asphalt paving for walks and parking lot.
 - 3. Installing pavement striping.
 - 4. Installing reinforced turf.

1.3 RELATED WORK

- A. Section 02100, Site Preparation.
- B. Section 02200, Earthwork.

1.4 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
 - 4. MassDOT construction standards and specifications.
 - 5. Americans with Disabilities Act (ADA).
 - 6. Massachusetts State Building Code.
- B. The following abbreviations are included herein and shall mean:
 - 4. S.S.H.B. – Standard Specifications for Highways and Bridges.
 - 5. A.S.T.M. – American Society for Testing and Materials.

6. A.A.S.H.T.O. – American Association of State Highway and Transportation Officials.

1.5 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.6 PROJECT CONDITIONS

- A. Comply with Section 02000 requirements.
- B. Utilities: Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by all concerned parties.
- C. Do not use frozen materials or materials mixed or coated with ice or frost.
- D. Do not install paving over wet, saturated, muddy or frozen subgrade. Remove and replace unit paver work damaged by frost or freezing.

1.7 DELIVERY, STORAGE & HANDLING

- A. Protect aggregate materials during storage and construction against soiling or contamination from earth and other materials.

1.8 CLEAN-UP

- A. Upon completion of work under this Section, all excess materials and debris resulting from work under this Section which have not previously been cleaned up shall be cleaned up and removed from the project site.

B. PART 2 – PRODUCTS

2.1 GRAVEL BASES

- A. Reference to gravel base material for all paving shall conform to the gradation requirements in Section 31 00 00, Earthwork, under the graded level.
- B. Crushed aggregate base: sound angular, crushed stone, crushed gravel, crushed slag or other types of suitable locally available materials complying with National Crushed Stone Association (NCSA) Master Range Grading, or locally accepted standards.

2.2 BITUMINOUS PAVEMENT

- A. Bituminous concrete shall be Class I, Type I-1 conforming to description of S.S.H.B., Section 460 for Binder Course and Top or Wearing Course and in accordance with Division III, Section M, Materials. "Dense Mix" shall conform to Table A in paragraph M3.11.03.

2.3 PAVEMENT STRIPING

- A. Material for pavement striping shall be chlorinated rubber-based traffic marking paint compatible with bituminous concrete, factory mixed, quick drying and non-bleeding.

Color to be white. Paint shall be as approved by the Town of Plymouth and as manufactured by:

The Sherwin-Williams Company, Inc.:
"Seffast" Chlorinated Rubber Zone Marking

or an approved equal.

2.4 REINFORCED TURF

A. Material for the reinforced turf shall be **StabiliGrid®**, distributed by:

Eco-Terr Distributing Inc.
3020 Iss-Pn Lk Rd PMB 202
Sammamish, WA 98075
Phone: (425) 657-7958
Fax: (425) 391-4890
<http://www.ecoterr.com/>

B. Material for leveling layer under **StabiliGrid®**: engineered mix of 60% clean crushed gravel (3/4" aggregate size) and 40% sandy soil is recommended.

C. PART 3 – EXECUTION

3.1 SUBGRADE FOR PAVEMENTS

A. Grading: do any necessary grading in addition to that performed in accordance with Section 31 00 00 – Earthwork, to bring subgrades, after final compaction, to the required grades and sections for pavements.

B. Preparation of Subgrade: loosen exceptionally hard spots and re-compact. Remove spongy and otherwise unsuitable materials and replace with stable material. Fill and tamp traces of utility trenches.

C. Compaction of Subgrade: compact the subgrade of all surface areas with appropriate equipment or other means to such a degree as will insure against settlement of the superimposed work.

D. Checking Subgrade: maintain all subgrades in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed. Place grade stakes spaced sufficiently to afford facility for checking the subgrade levels. Correct irregularities, compacting thoroughly any fill materials.

E. Utility Structures: check for correct elevations and position all utility structure covers, grates, valve boxes and similar structures located within areas to be paved or surfaced and make, or have made, any necessary adjustments in such structures.

3.2 INSPECTION

A. Examine subgrades, finished surfaces, and installation conditions. Do not start curb, marker, cobblestone or edging work until unsatisfactory conditions are corrected.

3.3 PREPARATION

- A. Grading: do any necessary grading to bring subgrades, after final compaction, to the required grades and sections for site improvements.
- B. Preparation of subgrade: loosen exceptionally hard spots and re-compact. Remove spongy and otherwise unsuitable materials and replace with stable material.
- C. Compaction of subgrade: maintain all subgrades in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed. Place grade stakes spaced sufficiently to afford facility for checking the subgrade levels. Correct irregularities, compacting thoroughly any fill materials.

3.4 GRAVEL BASES

- A. Base courses shall consist of graded gravel material, compacted in equal thickness layers of six (6) inches maximum compacted thickness, upon the prepared and approved subgrade to the finished compacted thickness shown on the Drawings and as specified herein.
- B. Gravel shall be placed and spread in uniform layers of self-spreading vehicles or with power graders of approved types or by hand. Care shall be taken while spreading to rake forward and distribute the largest stones so that they will be at the bottom of the gravel course and be evenly distributed.
- C. The gravel so placed shall be thoroughly watered and rolled true to the lines and grades with a roller weighing eight (8) to ten (10) tons. Any depressions that appear during or after the rolling shall be filled with gravel and re-rolled until the surface is true and even. Any portion which is not accessible to a roller shall be compacted by mechanical or hand tamper.
- D. The surface of any layer shall be maintained in its finished condition until the succeeding layer is placed. The base shall be properly drained at all times.
- E. The finished grade of the base course shall be true to the lines and grades as shown on the Drawings, less thickness of pavement including cross-sections. Grade evenly and smoothly between points called for, especially transition zones, and rounding vertical curves.

3.5 BITUMINOUS PAVING

- A. A tack coat shall be applied to the surface of all gravel bases to receive bituminous paving and the edges of all cut bituminous concrete pavement prior to placing the bottom course of new bituminous concrete. The rate of tack coat application shall be 0.05 to 0.15 gallons per square yard. The tack coat shall spread by approved methods to achieve one hundred percent (100%) coverage of existing surface. No more tack coat than is necessary for the day's operation shall be applied at one time. All traffic not essential to the work shall be kept off the tack coat.
- B. Pavement shall consist of a two course, Class I, Type I-1 bituminous concrete laid in two (2) courses: the bottom course shall have a compacted thickness as shown on the Drawings and as specified herein. The top or wearing course shall be "Dense Mix" and have a compacted thickness as shown on the Drawings and as specified herein. Thickness given herein for pavement is minimum dimensions and not "average" thickness. Construction shall conform to S.S.H.B. Section 460.
- C. Bituminous Concrete Paving Thickness
 - 1. Top/Wearing Course – 1-1/2" thick

2. Bottom/Binder Course – 2" thick

- D. When tested with a ten (10) foot straight edge, parallel with the center line of the surface course, there shall be no deviation from the true surface in excess of one-eighth (1/8) inch measured in any direction. Bituminous surfaces shall be smooth and free of surface irregularities and defects. Resurfacing of bituminous surfaces due to such irregularities or deviations from smooth planes shall be done by the Contractor without additional compensation.

3.6 PAVEMENT STRIPING

A. Layout.

1. Snap chalk lines for parking area and crosswalks prior to painting, ensuring accuracy of layout, parallel alignment as appropriate, and straight lines. Review layout with the Owner and the Landscape Architect prior to painting.

B. Painting.

1. Paint to be applied only after bituminous concrete is adequately cured (minimum three (3) weeks) when no bleeding or discoloration of the lines will occur. Apply one heavy coat (there shall be no transparency when striping is completed) using an approved striping machine in accordance with the manufacturer's latest printed direction. Exercise care to avoid pears, ragged lines, or spillage on adjacent surfaces. All lines to be 12-inch wide unless indicated otherwise. Do not spray when wind will cause overspray.
2. Correct any unacceptable line painting, as directed.

3.7 REINFORCED TURF

A. Preparation

1. Place a minimum of 2" of the Leveling Layer material (over prepared sub base) to grades shown on plans, in lifts not to exceed 3" (if using a plate compactor or large rolling machine), compacting each lift separately enough to provide a stable, flat, non-shifting surface. Thickness of leveling layer as shown on the Drawings.
2. For best visual appearance of **flat** surfaces (sloped or not), grading should be "straight" to within 1/4" for every three feet in length, and not create a sharp "point" in the grade. Use a straight edge or laser level to assist and verify. If designed in, rolling "contours" will not affect the grid unit performance.

B. Installation of **StabiliGrid®**

1. Establish a layout line (using string and stakes) from one corner, heading 2 directions to form a 90 degree guide point. For radius applications, use a center layout line approach to keep the grid units straight in the radius area.
2. Install the **StabiliGrid®** units by starting in one corner, with one layer unit, with the "tabs" (not the slots) facing the directions of installation.
3. Allow individual, pre-assembled grid layers to "lie" in the installation area for at least 2 minutes prior to connecting together. Do this by "staging" the next row before actually connecting it to the next grid section.

4. Then proceed to connect additional units perpetually until the entire surface has been covered. Slightly "stretch" each unit apart after connecting to the previously installed unit. **Do not install the units from the outside edges to the center.** Cutting can be performed with hand saws, or a portable power saw. When anchors are required (for sloped areas typically) install as described above before filling the grid cells.
5. Deliver soil fill to the grid area by using a tractor or other spreading apparatuses. Dump trucks and tractors may drive on the grid as long as they do not exceed the load-bearing capacity of the grid and sub base engineering. Sharp turning of heavy construction vehicles on empty grid units must be minimized. **The Fill should be first delivered to the center of the area.**
6. The Fill is then spread laterally out from the center to the edges, equally from all sides of the pile, using power brooms, blades, flat bottomed shovels and/or wide "asphalt rakes" to fill the cells. A stiff bristled broom may be used for final "finishing".
 - a. For Soil/Seed fill, soil should be saturated and at a finished level approx. $\frac{1}{4}$ "min. to $\frac{1}{2}$ " max. below the top surface of the grid cells.
 - b. Seed or hydro-seed as specified or desired.
7. Cleaning
 - A. Remove and replace tile segments of **StabiliGrid®** units where 2 or more "tabs" are broken, or if cell walls are broken or damaged, reinstalling as specified, with no evidence of replacement.
 - B. Perform cleaning during the installation of work and upon completion of the work. Remove all excess materials, debris, and equipment from site.
 - C. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

END OF SECTION

SECTION 02830

FIELD STONE RETAINING WALL

GENERAL

1- RELATED DOCUMENTS

- Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

A. SUMMARY

B. This Section includes the following:

C. Dry-laid stone retaining wall.

D. Related Sections include the following:

E. Section 02200, Earthwork.

F. PERFORMANCE REQUIREMENTS

G. Structural Performance: Provide segmental retaining walls capable of withstanding the effects of loads due to soil pressures resulting from grades indicated.

H. Include the effects of sloped backfill as indicated on Drawings.

I. Include the effects of superimposed loads as indicated on Drawings.

J. SUBMITTALS

K. Product Data: Submit sample of new stones to be blended with existing stones.

L. Installer Qualifications: Engage an experienced installer who has completed dry-laid stone retaining walls similar in material, design, and extent to that indicated for Project that has resulted in construction with a record of successful in-service performance.

M. Mockups: Before installing dry-laid retaining wall, construct sample wall section (3' in length, minimum) to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for completed Work.

N. Locate mockup in the locations indicated or, if not indicated, as directed by Owner's Representative.

O. Build mockup as shown on Drawings.

- P. Build mockup to include:
 - Q. Backfill to typical finished grades at both sides of wall.
 - R. Include typical end construction at one end of mockup.
 - S. Notify Owner's Representative 7 days in advance of the dates and times when mockup will be constructed.
 - T. Maintain mockup during construction in an undisturbed condition as a standard for judging the completed Work.
 - U. Approval of mockup does not constitute approval of deviations from Contract Documents contained in mockup, unless such deviations are specifically approved by Owner's Representative in writing.
 - V. When directed, demolish and remove mockup from Project site.
 - W. Approved mockup in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.
- X. DELIVERY, STORAGE, AND HANDLING
- Y. Deliver materials to Project Site in an undamaged condition.
 - Z. Store and handle retaining wall units and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, or other causes.
 - AA. Store and handle geotextiles according to ASTM D 4873.

PRODUCTS

BB. STONES

- CC. Provide field stones of dimension, color and texture to match existing stones.

DD. INSTALLATION MATERIALS

- EE. Base: Comply with requirements of Division 2 Section "Earthwork" for base material.
- FF. Drainage Fill: Comply with requirements of Division 2 Section "Earthwork."
- GG. Filter Fabric: Provide non-woven geotextile fabric composed of polypropylene fibers, inert to biological growth and resistant to chemicals, alkalis and acids, such as Mirafi 140N, or approved equal.

EXECUTION

HH. EXAMINATION

- II. Examine areas to receive retaining wall and conditions under which wall will be installed, with Installer present, for compliance with requirements for excavation tolerances, condition of subgrades, and other conditions affecting performance of retaining walls.

JJ. Do not proceed with installation until unsatisfactory conditions have been corrected.

~~KK. RETAINING WALL INSTALLATION~~

- LL. General: Construct the dry-laid stone retaining wall per the Drawings and as specified herein.

END OF SECTION

SECTION 02900

LAWNS AND PLANTING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division General Requirements, apply to the work of this Section.
- B. Examine all other Sections of the Specifications for requirements that affect work of this Section, whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all under the Contract.

1.2 SCOPE OF WORK

- A. Provide landscape work as shown and specified:
 - 1. Trees
 - 2. Shrubs
 - 3. Herbaceous perennial plantings
 - 4. Grass lawns
 - 5. Soil preparation
 - 6. Restoration of existing fruit trees
 - 7. Initial maintenance of landscape materials

1.3 RELATED DOCUMENTS

- A. Section 02200, Earthwork.

1.3 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
 - 1. American National Standards Institute (ANSI).
 - 2. American Standard for Nursery Stock (ASNS).
 - 3. United States Department of Agriculture (USDA).

1.4 QUALITY ASSURANCE

- A. Subcontract landscape work to a single firm specializing in landscape work.
- B. Source Quality Control:
 - 1 General: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
 - 2 Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability to Landscape Architect, together with proposal for use of equivalent material.

- 3 Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
- 4 Trees, Shrubs and Plants: Provide trees, shrubs, and plants of quantity, size, genus, species, and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock". Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.
- 5 Label at least one tree and one shrub of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name. Where formal arrangements or consecutive order of trees or shrubs are shown, select stock for uniform height and spread, and label with number to assure symmetry in planting.
- 6 Inspection: The Landscape Architect may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size, and quality. Landscape Architect retains right to further inspect trees and shrubs for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site and replace with healthy plants, which the Landscape Architect reserves the right to inspect for approval or rejection.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract, including General Conditions and Bid Document Sections.
- B. Plant and Material Certifications:
 1. Certificates of inspection as required by governmental authorities.
 2. Manufacturer's or vendor's certified analysis for soil amendments and fertilizer materials.
 3. Label data substantiating that plants, trees, shrubs and planting materials comply with specified requirements.
 4. Seed vendor's certified statement for each grass seed mixture required and hydro-seed mixture required, stating botanical and common name, percentages by weight, and percentages of purity, germination, and weed seed for each grass seed species.
- C. Planting Schedule: Proposed planting schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.
- D. Maintenance Instructions: Contractor to prepare typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work or one full year. Instructions to be submitted to Landscape Architect, who will forward them on to the Owner. Submit prior to expiration of required maintenance period(s).

1.6 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.
- B. Trees and Shrubs: Provide freshly dug trees and shrubs. Do not prune prior to delivery unless otherwise approved by Landscape Architect. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches, or destroy natural shape. Provide protective covering during delivery. Do not drop any stock during delivery.
 - 1. Deliver trees and shrubs after preparations for planting has been completed and plant immediately after plants and their locations have been approved by the Landscape Architect. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture.
 - 2. Do not remove container-grown stock from containers until planting time.

1.7 JOB CONDITIONS

- A. Utilities: Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, marked or unmarked grave sites or obstructions, notify Landscape Architect before planting.

1.8 SEQUENCING AND SCHEDULING

- A. Planting Time: Proceed with, and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.
 - 1. Plant or install materials during normal planting seasons for each type of plant material required. Do not plant with wet or frozen conditions.
 - 2. Correlate planting with specified maintenance periods to provide maintenance from date of substantial completion.
- B. Coordination with Lawns: Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to Landscape Architect. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.
- C. Existing Fruit Tree Pruning: Prune trees during dormant stage – late winter or early spring (March).

1.9 SPECIAL PROJECT WARRANTY

- A. Warranty trees, shrubs and herbaceous materials and lawn for one year after date of final acceptance.
 - 1. Warranty trees, shrubs and herbaceous materials, for a period of one year after date of final acceptance, against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond Landscape Installer's control.

2. Remove and replace trees, shrubs, or other plants found to be dead or in unhealthy condition during warranty period. Make replacements during growth season. Replace trees and shrubs that are in doubtful condition at end of warranty period; unless, in opinion of Landscape Architect, it is advisable to extend warranty period for a full growing season.
3. Another warranty inspection will be conducted at end of extended warranty period, to determine acceptance or rejection. Only one replacement (per tree, shrub or plant) will be required at end of warranty period, except for losses or replacements due to failure to comply with specified requirements.

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. Topsoil may be stockpiled for re-use in landscape work, if determined, through soil testing, to be suitable. Contractor shall test soil composition through the University of Massachusetts Soil and Plant Tissue Testing Laboratory, 203 Paige Laboratory, 161 Holdsworth Way, University of Massachusetts, Amherst, MA, 01003, 413-545-2311, www.soiltest.umass.edu, soiltest@umass.edu. If quantity of stockpiled topsoil is insufficient or includes grass seed, provide additional topsoil as required to complete landscape work.
- B. Provide new topsoil that is screened to ¾" in size, fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than ¾" inches in any dimension, and other extraneous or toxic matter harmful to plant growth.
 1. Obtain topsoil from local sources, only from naturally, well-drained sites where topsoil occurs in a depth of not less than 6 inches. Do not obtain from bogs or marshes.
 2. Topsoil for lawn areas shall be sandy loam as defined by the USDA Textural Classification System, admixed with a soil wetting agent in accordance with manufacturer's specifications. The soil shall be consistent in physical and chemical composition and shall conform to the following requirements.
 - A. Acidity Range: pH value 6.0 to 6.8
 - B. Particle Size Analysis:
 - 70-80% coarse masonry sand (0.5-1.0 mm)
 - Maximum 20% silt
 - Maximum 20% clay

2.2 SOIL AMENDMENTS

- A. Lime: Natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.
- B. Compost: "Earthlife" as available through Earthlife Sales Co, Division of Delchen Sales, Inc., 354 North Main Street, Doylestown, PA 18901 or approved equal, completely composted and free from deleterious materials such as glass, paper, plastics, metals, etc.
- C. Peat Humus: Finely divided peat, so completely decomposed and free of fibers that its biological identity is lost. Provide in granular form, free of hard lumps and with pH range suitable for intended use.

- D. Bonemeal: Commercial, raw, finely ground; 4 percent nitrogen and 20 percent phosphoric acid.
- E. Superphosphate: Soluble mixture of treated minerals; 20 percent available phosphoric acid.
- F. Sand: Clean, washed sand, free of toxic materials.
- G. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants.
- H. Mulch: Organic mulch free from deleterious materials and suitable for top dressing of trees, shrubs, or plants and consisting of the following:
 - 1. Shredded cedar mulch (natural in color).
- J. Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources containing following percentages of available plant nutrients:
 - 1. For flowering trees and shrubs, provide fertilizer with not less than 5 percent total nitrogen, 10 percent available phosphoric acid and 5 percent soluble potash.
 - 2. For non-flowering trees and shrubs, provide fertilizer with not less than 10 percent total nitrogen, 6 percent available phosphoric acid and 4 percent soluble potash.
 - 3. For bedding plants (ground covers, perennials, etc.), provide Osmocote time release fertilizer 14-14-14. Fertilizer shall be furnished in standard containers, with name, weight and guaranteed analysis of contents clearly marked thereon.
 - 4. For lawns, provide fertilizer with percentage of nitrogen required to provide not less than 1 pound of actual nitrogen per 1,000 sq. ft. of lawn area and not less than 4 percent phosphoric acid and 2 percent potassium. Provide nitrogen in a form that will be available to lawn during initial period of growth; at least 50 percent of nitrogen to be organic form.

2.3 PLANT MATERIALS

- A. Quality: Provide trees, shrubs, and other plants of size, genus, species, and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock".
- B. Deciduous Trees: Provide trees of height and caliper scheduled or shown and with branching configuration recommended by ANSI Z60.1 for type and species required. Provide single stem trees except where special forms are shown or listed.
 - 1. Provide balled and burlapped (B&B) deciduous trees.
 - 2. Container grown deciduous trees will be acceptable in lieu of balled and burlapped deciduous trees subject to specified limitations of ANSI Z60.1 for container stock.
- C. Deciduous Shrubs: Provide shrubs of the height shown or listed and with not less than minimum number of canes required by ANSI Z60.1 for type and height of shrub required.
 - 1. Provide balled and burlapped (B & B) deciduous shrubs.

2. Container grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs subject to specified limitations for container grown stock.
- D. Coniferous and Broadleafed Evergreens: Provide evergreens of sizes shown or listed. Dimensions indicate minimum spread for spreading and semi-spreading type evergreens and height for other types, such as globe, dwarf, cone, pyramidal, broad upright, and columnar. Provide normal quality evergreens with well-balanced form complying with requirements for other size relationships to the primary dimension shown.
1. Provide balled and burlapped (B&B) evergreens.
 2. Container grown evergreens will be acceptable, subject to specified limitations for container grown stock.
- F. Ground Cover and other Herbaceous Plants: Provide plants established and well rooted in removable containers or integral peat pots and with not less than minimum number and length of runners required by ANSI Z60.1 for the pot size shown or listed.
- G. Grass Materials
1. Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified, below:
 - a. All seed must be treated with endophyte. All seed mixture shall be 40% Creeping Red Fescue; 30% 'Charger II' Perennial Rye Grass; 20% 'KenBlue' Kentucky Blue Grass; and 10% 'Tiffany' Chewings Fescue.
- H. Miscellaneous Landscape Materials:
1. Gravel: Water-worn, hard, durable gravel, washed free of loam, sand, clay, and other foreign substances, and of following size range and color:
 - a. Size Range: 3/8 inch maximum, 1/8 inch minimum (pea gravel).
 - b. Color: Readily-available natural gravel color range.
 2. Anti-Erosion Mulch: Provide clean, seed-free salt hay or threshed straw of wheat, rye, oats, or barley for all newly seeded lawn areas.
 3. Anti-Desiccant: Emulsion type, film-forming agent designed to permit transpiration, but retard excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.
 4. Filtration/Separation Fabric: Water permeable filtration fabric of fiberglass or polypropylene fabric.
 5. Wrapping: Tree-wrap tape not less than 4 inches wide, designed to prevent borer damage and winter freezing.

PART 3 - EXECUTION

3.1 PREPARATION - GENERAL

- A. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations and outline areas and secure Landscape Architect's acceptance before start of planting work. Make minor adjustments as may be required. (See Subparagraph 3.5.A for on-site review and inspection of plants and their locations.)

3.2 PREPARATION OF PLANTING SOIL

- A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful or toxic to plant growth.
- B. Mix specified soil amendments and fertilizers with topsoil at rates specified. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.
1. Planting soil mixture shall consist of one part peat humus or compost and two parts topsoil.
 2. For pit and trench type backfill, mix planting soil prior to backfilling, and stockpile at site.
 3. For planting beds and lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.
 - a. Mix lime with dry soil prior to mixing of fertilizer for lawn seeding areas as required to produce a pH value of 6-6.5.
 - b. Distribute lime evenly throughout lawn seeding area at a rate of 40 lbs. Per 1,000 square feet.
 - c. Prevent lime from contacting roots of acid-loving plants.
 - d. Apply phosphoric acid fertilizer (other than that constituting a portion of complete fertilizers) directly to subgrade before applying planting soil and tilling.

3.3 PREPARATION FOR PLANTING LAWNS

- A. Prepare seeded lawn soil:
1. Mix lime with dry soil prior to mixing of fertilizer for lawn seeding areas as required to produce a pH value of 6-6-8.
 2. Distribute lime evenly throughout lawn seeding area at a rate of 40 lbs per 1,000 square feet.
 3. Prevent lime from contacting roots of acid-loving plants.
- B. Loosen subgrade of lawn areas to a minimum depth of 4 inches. Remove stones measuring over $\frac{3}{4}$ inches in any dimension. Remove sticks, roots, rubbish, and other extraneous matter. Limit preparation to areas that will be planted promptly after preparation.
1. Spread top soil to minimum depth required to meet lines, grades, and elevations shown, after light rolling and natural settlement. Add specified soil amendments and mix thoroughly into upper 6 inches of topsoil.
 2. Place approximately 2 of total amount of top soil required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil. Add specified soil amendments and mix thoroughly into upper 6 inches of topsoil.
- C. Preparation of Unchanged Grades: Where lawns are to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows: Till to a depth of not less than 6 inches. Apply soil amendments and initial fertilizers as

specified. Remove high areas and fill in depressions. Till soil to a homogenous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter.

1. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such material outside of Owner's property. Do not turn existing vegetation over into soil being prepared for lawns.
 2. Apply specified commercial fertilizer at rates specified and thoroughly mix into upper 2 inches of topsoil. Delay application of fertilizer if lawn planting will not follow within one (1) day.
- D. Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll, rake, and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
- E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- F. Restore lawn areas to specified condition, if eroded or otherwise disturbed, after fine grading and prior to planting.

3.4 PREPARATION OF PLANTING BEDS

A. Prepare plant bed soil.

1. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful or toxic to plant growth.
 2. Mix specified soil amendments and fertilizers with topsoil at rates specified. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.
 - a. Planting soil mixture shall consist of one part peat humus or compost and two parts topsoil.
 - b. For pit and trench type backfill, mix planting soil prior to backfilling, and stockpile at site.
 - c. Mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.
 - d. Apply phosphoric acid fertilizer (other than that constituting a portion of complete fertilizers) directly to subgrade before applying planting soil and tilling.
- B. Loosen subgrade of planting bed areas to a minimum depth of 8 inches using a culti-mulcher or similar equipment. Remove stones measuring over 1-1/2 inches in any dimension. Remove sticks, stones, rubbish, and other extraneous matter.
- C. Spread planting soil mixture to minimum depth required to meet lines, grades, and elevations shown, after light rolling and natural settlement. Place approximately 2 of total amount of planting soil required. Work into top of loosened subgrade to create a transition layer, then place remainder of the planting soil.
- D. Apply Osmocote time-release fertilizer (14-14-14) by broadcasting over entire plant beds at a rate of three (3) pounds per 100 square feet.
- E. Mulch entire plant bed areas after planting trees and shrubs and prior to planting herbaceous materials with a 3 inch layer of shredded pine bark mulch.

3.5 PLANTING TREES AND SHRUBS

- A. Place all trees and shrubs in their locations for review by the Landscape Architect prior to excavation. Contractor must notify Landscape Architect a minimum of three (3) full working-days in advance to schedule on-site review. Contractor **must** ensure that **all** plants are set out in their locations and ready for review upon Landscape Architects arrival. If all plants are not on-site, laid out and ready for review, the Landscape Architect may bill the Contractor for the time and expenses of the unnecessary site visit. The Contractor is responsible for this added expense, not the Client. Contractor is responsible to reschedule the on-site review with the Landscape Architect.
- B. Excavation
1. Excavate pits and beds with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard subsoil in bottom of excavation.
 - a. Allow for 9-inch setting layer of planting soil mixture.
 - b. For balled and burlapped (B&B) trees and shrubs, make excavations at least twice again as wide as the ball diameter and equal to the ball depth, plus allowance for setting of ball on a layer of compacted backfill, 6 inches as shown in the planting detail.
 - c. For container grown stock, excavate as specified for balled and burlapped stock, adjusted to size of container width and depth.
 2. Dispose of subsoil removed from planting excavations. Do not mix with planting soil or use as backfill.
 3. Fill excavations for trees and shrubs with water and allow water to percolate out prior to planting.
- C. Set balled and burlapped (B&B) stock on layer of compacted planting soil mixture, plumb and in center of pit or trench with top of ball 6 inches above finished landscape grades. Remove burlap from sides of balls; retain on bottoms. When set, place additional backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.
- D. Set container grown stock, as specified, for balled burlapped stock, except cut cans on 2 sides with an approved can cutter; remove bottoms of wooden boxes after partial backfilling so as not to damage root balls.
- E. Dish top of backfill to allow for mulching.
- F. Apply mulch to pits and planted areas. Provide no less than 3 inch thickness uniformly throughout plant bed areas.
- G. Apply anti-desiccant, using power spray, to provide an adequate film over trunks, branches, stems, twigs and foliage.
1. If deciduous trees or shrubs are moved when in full leaf, spray with anti-desiccant at nursery before moving and spray again 2 weeks after planting.
- H. Prune, thin out, and shape trees and shrubs in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees, if any. Prune shrubs to retain natural character.

- I. Remove and replace excessively pruned or mis-formed stock resulting from improper pruning.
- J. Wrap tree trunks of 2 inches caliper and larger. Start at ground and cover trunk to height of first branches and securely attach. Inspect tree trunks for injury, improper pruning and insect infestation and take corrective measures before wrapping.

3.6 PLANTING GROUNDCOVER, PERENNIALS AND OTHER POTTED PLANTS

- A. Stake outlines for species areas and space plants as indicated or scheduled for review by the Landscape Architect prior to planting. Coordinate on-site review at the same time as for trees and shrubs. (See Subparagraph 3.05.A for contractor's responsibilities pertaining to on-site review.)
- B. Push aside mulch at planting locations and dig holes large enough to allow for spreading of roots and backfill with planting soil. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover crowns of plants with wet soils.
- C. Replace mulch around each plant not less than 3 inches thick.

3.7 SEEDING NEW LAWNS

- A. Seeding shall not be done on frozen ground or when the temperature is 32°F or lower.
- B. Seeding shall be done during periods generally accepted by the local nursery trade for the specified seed blend.
- C. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.
- D. Sow seed for preliminary application using a slit seeding machine immediately after final soil preparation. Then hydro-seed top cover. Contractor to submit hydro-seed mixture for approval. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.
- E. Sow not less than at the rate of 6 pounds per 1,000 square feet.
- F. If needed, rake seed lightly into top 1/8 inch of soil, roll lightly, and water with a fine spray.
- G. Protect seeded areas against erosion by spreading specified lawn mulch after completion of seeding operations. Spread uniformly to form a continuous blanket not less than 1-1/2 inches loose measurement over seeded areas.
 - 1. Anchor mulch by spraying with asphalt emulsion at the rate of 10 to 13 gallons per 1,000 sq. ft. Take precautions to prevent damage or staining of construction or other plantings adjacent to mulched areas.
- H. At end of maintenance period, a healthy, well-rooted, even-colored viable lawn will appear, free of weeds, open joints, bare areas, and surface irregularities.

3.8 MAINTENANCE

- A. Begin maintenance immediately after planting.
- B. Trees, shrubs and other plants.

1. Maintain trees, shrubs, and other plants until final acceptance, but in no case less than 30 days after substantial completion of planting.
2. Maintain trees, shrubs, and other plants by pruning, cultivating, and weeding as required for healthy growth. Restore planting saucers. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insects and disease.

C. Lawns

1. Maintain lawns for not less than the period stated below, and longer as required to establish an acceptable lawn.
 - a. If sodded in fall and not given full 60 days of maintenance, or if not considered acceptable at that time, continue maintenance the following spring until acceptable lawn is established.
2. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, re-grading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas until final acceptance.
 - a. Mowing:
 1. When grass reaches 3-1/2 inches in height, mow to 3 inches in height.
 2. Maintain grass between 2-1/2 and 3 inches in height.
 3. Do not cut off more than 40% of grass leaf in single mowing.
 - b. Fertilizer: Apply uniformly 30 days after sodding.

3.10 CLEANUP AND PROTECTION

- A. During landscape work, keep pavements clean and work area in an orderly condition.
- B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.11 INSPECTION AND ACCEPTANCE

- A. When landscape work is completed, including maintenance, Landscape Architect will, upon request, make an inspection to determine acceptability.
 1. Landscape work may be inspected for acceptance in portions as agreeable to Landscape Architect, provided each portion of work offered for inspection is complete, including maintenance.
- B. When inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by Landscape Architect/Owner's Representative and found to be acceptable. Remove rejected plants and materials promptly from project site.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

1.00 GENERAL

1.01 References: General provisions of contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 WORK INCLUDED

A. The work under this section consists of furnishing and installing all structural concrete and related work as shown on the drawings and as specified herein and includes, but is not limited to, the following:

1. Slabs on grade.
2. Structural footings, foundations and underpinning.
3. All other locations where reinforced or plain concrete may be required.

1.03 REFERENCES

A. Reference the following codes and standards as apply to each specific application.

1. ACI 301 - Structural Concrete for Buildings.
2. ACI 302 - Guide for Concrete Floor and Slab Construction.
3. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
4. ACI 305R - Hot Weather Concreting.
5. ACI 306R - Cold Weather Concreting.
6. ACI 308 - Standard Practice for Curing Concrete.
7. ACI 318 - Building Code Requirements for Reinforced Concrete.
8. ANSI/ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
9. ASTM C33 - Concrete Aggregates.
10. ASTM C94 - Ready-Mixed Concrete.
11. ASTM C150 - Portland Cement.
12. ASTM C260 - Air Entraining Admixtures for Concrete.

13. ASTM C494 - Chemicals Admixtures for Concrete.
14. ACI SP-66 - American Concrete Institute - Detailing Manual.
15. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
16. CRSI - Concrete Reinforcing Steel Institute - Manual of Practice.
17. CRSI - Placing Reinforcing Bars.

1.04 SUBMITTALS

- A. Provide product data for all accessories, admixtures and inserts.
- B. Fully show all bar sizes, spacing, locations, and quantities of reinforcing steel and wire fabric. Provide bending and cutting schedules.
- C. Concrete Constituents: Submit to Designer a detailed list of concrete materials, and corresponding sources, proposed for use in concrete for this project along with results of past strength tests for each mix design.

1.05 RECORD DOCUMENTS

- A. Accurately record actual locations of embedded utilities and components that concealed from view.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.
- B. Conform to ACI 305R when concreting during hot weather.
- C. Conform to ACI 306R when concreting during cold weather.
- D. Detailing and construction of formwork, shoring and bracing shall be sufficient to maintain required alignments and surfaces. All work shall conform to ACI 318 and ACI 301, the State Building Code, and accepted construction practice.
- E. Reinforcing steel detailing and installation shall be in accordance with CRSI - Manual of Standard Practice, ACI SP-66, and ACI 318.
- F. Field inspection and testing requirements are as follow:
 1. Field inspection and testing will be performed in accordance with ACI 301, and the requirements of the State Building Code and referenced standards.
 2. Submit proposed mix design to inspection and testing firm for review prior to commencement of work.
 3. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

4. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.
5. One slump test will be taken for each set of test cylinders taken.
6. All reinforcing steel shall be inspected by a certified testing and inspection agency and shall be paid for by the owner and coordinated by the contractor. Inspection and testing of cast-in-place concrete work will be performed by an independent Testing Agency, under a separate contract with the Owner. Materials and workmanship shall be subjected to inspection and testing in mill, shop and/or field by Designer and/or Testing Agency. Such inspection and testing shall not relieve Contractor of his responsibility to provide his own inspection, testing, and quality control as necessary to furnish materials and workmanship in accordance with requirements of this section.
7. Requirements of this section are generally written for purpose of securing best workmanship and end result. Certain deviations may be desirable under certain project conditions, however, and may be allowed only after examination by and upon written approval of Designer. Any such approved deviation shall not be construed as a waiver of requirements of Specifications.
8. Contractor shall investigate source of and allow access to materials required to be sampled and tested by Testing Agency.
9. Sampling and testing required by Designer to determine if materials proposed for use in project comply with Specification requirements shall be made by Testing Agency prior to actual use of materials in project. Contractor shall coordinate with Designer and Testing Agency to insure that materials are supplied, sampled, tested and approved so as not to delay progress of job.
10. Whenever source, quality, or characteristics of approved material changes, or indicates lack of compliance with requirements of Contract Documents, Contractor shall resubmit additional materials for Testing Agency to sample and test until requirements are satisfied. Cost of additional sampling, testing, and inspection of materials and workmanship not originally conforming to requirements of Contract Documents shall be at Contractor's expense.
11. During progress of work, provide free and safe access to work at all times to Designer and Testing Agency so as to make possible proper inspection of work.
12. Notify Designer and Testing Agency prior to start of any phase of concrete work so as to afford them reasonable opportunity to inspect work. Such notification shall be made at least 24 hours in advance for concrete placements and at least 36 hours in advance for other inspections (forms, rebars, etc.).
13. Proceed with form construction, installation of embedded items, and reinforcement, but do not place concrete into or around such items until Designer has approved work.
14. Facilitate inspection and testing by Testing Agency. Contractor shall, at his own expense, furnish Testing Agency upon request with:
 - a. Information as to time and place of shipments of materials to plant and project site.
 - b. Representative sample pieces requested for testing.
 - c. Full and ample means and assistance for sampling and testing materials and proper facilities for inspection of work in plant and at proper site.
 - d. Covered box large enough to contain twenty-four standard concrete cylinders. At temperatures below 60 degrees F., box shall be electrically heated to maintain inside temperature of 60 to 80 degrees F. Cylinders shall be placed in box during molding and shall be covered with moist burlap until delivery to laboratory, 24 to 72 hours after molding.
 - e. Copies of mill test reports of shipments of cement and reinforcing steel.

15. Compression tests shall consist of one set of four cylinders for each test made, cured, and tested by Testing Agency during progress of job. One set of cylinders shall be taken for every 50 cubic yards of concrete or fraction thereof, or each day's pour, whichever is more frequent, and furthermore shall be taken from batch with highest slump.
16. Slump test, to check consistency, shall be made from sample used to mold cylinders. Additional slump test shall be taken of every batch delivered to job site as required.
17. Test for determination of air content shall be made for at least every third set of test cylinders and at least once daily or more often if adjustment is required to satisfy specifications.
18. Sampling, molding, curing, and testing of cylinders shall conform to ASTM requirements. Specimens shall be cured under laboratory conditions. Designer may require additional cylinders to be cured under field conditions when unusual conditions may tend to reduce concrete strength.
19. One cylinder of each set shall be tested for 7-day strength and remaining three for 28-day strength, unless otherwise directed by Designer.
20. Report of tests submitted to Designer shall include: name of job, date and location of pour, design strength of concrete, mix data, slump, air content (if tested), compressive strength, age and condition of test cylinder, type of fracture, and type of curing.
21. Average of any three consecutive 28 day strength tests representing each class of concrete shall be equal to or greater than specified strength (f_c) and not more than 10 percent of strength tests shall have values less than specified strength, but no test shall show an average strength (of any one set of cylinders) less than 85 percent of specified strength (f_c).
22. When tests of control specimens fall below these requirements, Designer may require 56 day cylinder tests or core specimens taken from concrete in question and tested in accordance with ASTM C42. If these specimens do not meet strength requirements, Designer will have right to require additional curing, load tests, strengthening or removal and replacement of those parts of structure which are unacceptable, and in addition, removal of such sound portions of structure as necessary to insure safety, appearance, and durability of structure. Additional testing, load tests, strengthening or removal and replacement of parts of structure and any costs associated with delay of project shall be at Contractor's expense.
23. Any material or workmanship which is rejected by Designer and/or Testing Agency either at plant or at job site, shall be replaced promptly by Contractor to satisfaction of Designer and/or Testing Agency, and at no expense to the Owner.
24. Acceptance of work and admixtures in plant shall not prevent final rejection at job site upon arrival or even after it has been installed, if work is found to be defective in any way.

2.00 PRODUCTS

2.01 CONCRETE MATERIALS

- A. Cement: ASTM C150.
- B. Fine and Coarse Aggregates:

Normalweight Fine Aggregate: shall be washed, inert, natural sand conforming to ASTM C33 and following additional requirements:

<u>Sieve</u>	<u>Retained Percent</u>
#4	0 - 5
#16	25 - 40
#50	70 - 87

#100 93 - 97

Fineness Modulus 2.80 (Plus/Minus 0.20)
 Organic Plate 2 maximum
 Silt 2.0 percent maximum
 Mortar Strength 100 percent minimum compression ratio
 Soundness 5 percent maximum loss, magnesium sulfate, five cycles

Normalweight Coarse Aggregate: shall be well graded crushed stone or washed gravel conforming to ASTM C33 and following additional requirements:

Designated Size (inches)	3	2	1-1/2	1	3/4	1/2	3/8
F.M.(+/-0.20)	7.95	7.45	7.20	6.95	6.70	6.10	4.50

Organic Plate 1 maximum
 Silt 1.0 percent maximum
 Soundness 5 percent maximum loss, magnesium sulfate, five cycles

Maximum designated sizes for normalweight coarse aggregate to be used in concrete sections shall be as noted below, except that sizes shall also be chosen in conjunction with required clearances.

One inch for sections more than eight and up to ten inches in thickness.

Three-quarter inch for sections more than three and up to eight inches in thickness.

C. Water: Clean and not detrimental to concrete.

2.02 CONCRETE MIXTURES:

- A. The Contractor shall recommend, on the basis of trial mixes and strength curves specified below, design mixes for each type and strength of concrete. The Testing Agency will verify that the proposed mix designs conform to all specification requirements.
- B. Sufficient materials for concrete mix design shall be furnished by Contractor not less than two weeks before use. Duplicate small samples plainly and neatly labeled with source, where proposed to be used, date, and name of collector shall be provided and presented to Testing Agency for permanent reference.
- C. Mixes shall be designed in accordance with "Method 1" of ACI 301, and the requirements of this Section. All concrete is normalweight unless specifically designated otherwise; air-dry weight not to exceed 150 lbs. per cubic foot.
- D. Limiting values shown in Table A apply for specific strengths of concrete with coarse aggregates less than one and one-half inches unless noted otherwise.

Table A

Minimum Allowable Compr. Strength at 28 day (psi)	Max. Allowable Net Water Content Gallons/Sack*	Minimum Permissible Cement Factor Sacks/Cubic Yard**
4000	5.75	6.00
3000	6.50	5.00

2000 working mat

* Maximum; decrease if possible. This represents total water in mix at time of mixing, including free water on aggregate.

** Minimum; increase as necessary to meet other requirements.

- E. In all slabs and walls exposed to weather, all concrete shall contain the approved air-entraining admixture as per manufacturer's written instructions, to provide entrained air, by volume, in the cured concrete within 4.5 to 6.5 percent.
- F. Any deviation from approved mix design, which Contractor deems desirable under certain project conditions, will not be allowed without written approval of Designer.

2.03 ADMIXTURES

- A. Water-Reducing Admixture - The approved water-reducing admixture shall be used in all concrete, in accordance with manufacturer's written instructions.
- B. Air Entraining admixture: ASTM C260.
- C. Chemical: ASTM C494 Type A - Water Reducing
- D. No admixtures shall contain calcium chloride.

2.04 ACCESSORIES

- A. Bonding Agent: Two component modified epoxy resin.
- B. Vapor Barrier: 6 mil thick clear polyethylene film.
- C. Non-Shrink Grout (where may be required): Premixed, non-metallic, capable of developing minimum compressive strength of 2,400 psi at 48 hours and 7,000 at 28 days.

2.05 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler: ASTM D1752; Closed cell polyvinyl chloride or molded vinyl foam, resiliency recovery of 95 percent if not compressed more than 50 percent of original thickness.
- B. Sealant and Primer: As specified in Section 07900.

2.06 REINFORCEMENT AND ACCESSORIES

- A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars, unfinished.
- B. Welded Steel Wire Fabric: ASTM A185; in flat sheets; unfinished.
- C. Tie Wire: Minimum 16 gage annealed type.
- D. Chairs, Bolsters, Bar Supports, Spacers shall be sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture.
- E. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete

Surfaces shall be plastic coated steel type; size and shape as required.

- F. Fabricate concrete reinforcing in accordance with CRSI Manual of Practice, ACI SP-66, ACI 318.
- G. Locate reinforcing splices not indicated on drawings, at point of minimum stress.

2.07 FORM MATERIALS AND ACCESSORIES

- A. Plywood shall be Douglas Fir or Spruce species; sheathing grade; clean, smooth sheets with true edges.
- B. Form Ties shall be snap-off type, galvanized metal, fixed or adjustable length, with waterproofing washer, free of defects that could create 1" of larger holes or defects in the concrete surface.
- C. Form Release Agent shall be colorless mineral oil which will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
- D. Corners shall be chamfered with rigid plastic or wood strip type, 3/4" x 3/4", maximum possible lengths.
- E. Preformed Steel Forms shall be minimum 16 gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

3.00 INSTALLATION

3.01 PREPARATION

- A. Prepare previously placed concrete by roughening to an amplitude of greater than 1/4" and cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- B. In locations where new concrete is dowelled to existing concrete or stone masonry, obtain the embedments noted on the drawings. Epoxy Adhesive for doweling shall be equivalent to the Hilti Hit "HY150" Epoxy Injection system for doweling into concrete and the Hilti Hit "HY20" Epoxy Injection System with screen tubes for doweling into masonry. Drill bit diameters and procedures shall be per manufacturer's instructions.
- C. Handle and store materials separately in such manner as to prevent intrusion of foreign matter, segregation, or deterioration. Do not use foreign materials or those containing ice. Remove improper and rejected materials immediately from point of use. Cover materials, including steel reinforcement and accessories, during construction period. Stockpile concrete constituents properly to assure uniformity throughout project.

3.02 ERECTION OF FORMWORK

- A. Hand trim sides and bottom of earth forms where used. Remove loose soil prior to placing concrete.
- B. Erect formwork, shoring and bracing in accordance with ACI 301 to achieve required geometry and stability.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Align joints and make watertight. Keep form joints to a minimum. Provide chamfer strips on

external corners of foundation walls. Maintain tolerances required by ACI 301.

- D. Apply form release agent on formwork in accordance with manufacturer's recommendations. Do not apply form release agent where concrete surfaces will receive applied coverings which are effected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
- E. Clean forms as erection proceeds and clean formed cavities of debris prior to placing concrete. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports. Do not allow ice or snow to accumulate within forms, but remove manually if this accumulates. Do not use de-icing salts and do not use water to clean out forms in cold weather conditions. Use compressed air or other means to remove foreign matter.
- C. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view.

3.03 PLACEMENT OF REINFORCING STEEL

- A. Reinforcement shall be placed in accordance with requirements of CRSI, "Recommended Practice for Placing Reinforcing Bars" and CRSI, "Recommended Practice for Placing Bar Supports", latest editions and with further requirements below.
- B. Reinforcement shall be accurately placed in accordance with Contract Documents and shall be firmly secured in position by wire ties, chairs, spacers, and hangers, each of type approved by Designer.
- C. Bending, welding or cutting reinforcement in field in any manner other than as shown on Drawings, is prohibited, unless specific approval for each case is given by Designer.
- D. Reinforcement shall be continuous through construction joints unless otherwise indicated on Drawings.
- E. Reinforcement shall be spliced only in accordance with requirements of Contract Documents or as otherwise specifically approved by Designer. Splices of reinforcement at points of maximum stress shall generally be avoided. Welded wire fabric shall lap six inches or one space plus two inches whichever is larger, and shall be wired together.
- F. At time concrete is placed, reinforcement shall be free of excessive rust, scale, or other coatings that will destroy or reduce bond requirements. Reinforcement expected to be exposed to weather for a considerable length of time shall be painted with a heavy coat of cement grout. Protect stored materials so as not to end or distort bars in any way. Bars that become damaged will be rejected.
- G. Before concrete is cast, check all reinforcement after it is placed to insure that reinforcement conforms to Contract Documents and approved Shop Drawings. Such checking shall be done only by qualified experienced personnel. In addition, the Designer shall be notified at least 3 days prior to concrete placement and given opportunity to inspect completed reinforcement and formwork before concrete placement.
- H. Field inspection of reinforcing steel will be performed by a certified testing and inspection agency and shall satisfy the requirements of the building inspector. The contractor shall be responsible for scheduling the inspector sufficiently in advance of concrete placement to allow him to perform his work.

3.04 JOINTS

- A. Construction and control joints indicated on Drawings are mandatory and shall not be omitted.
- B. Joints not indicated or specified shall be placed to least impair strength of structure and shall be subject to approval of Designer. Submit proposed locations of concrete control and construction joints for review and approval.

3.05 INSERTS, EMBEDDED PARTS, OPENINGS, AND ACCESSORIES

- A. Provide formed openings where required for items to be embedded in passing through concrete work. Locate and set in place items that will be cast directly into concrete. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work. Install steel sleeves, embedded wall plates and similar items, furnished by other trades, at locations shown on the drawings. Conform to requirements of ACI 318, paragraph 6.3, "Conduits and Pipes Embedded in Concrete", and as specified below.
- B. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement. Install waterstops so that they are continuous without interruption from reinforcement.
- C. Anchor bolts for column baseplates shall be installed with templates provided. Vertical alignment and plan locations shall be maintained within one-sixteenth inches of the locations shown on the drawings.
- D. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- E. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.
- F. Install vapor barrier under interior slabs on grade. Lap joints minimum 6 inches and seal watertight by taping edges and ends. Repair vapor barrier damaged during placement of concrete reinforcing. Repair with vapor barrier material; lap over damaged areas minimum 6 and seal watertight.
- G. Separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler. Place joint filler along floor slab edge. Set top to required elevations. Secure to resist movement by wet concrete. Extend joint filler from bottom of slab to within 1/4 inch of finished slab surface.

3.05 CONCRETE PLACEMENT

- A. Place concrete in accordance with ACI 304 or ACI 301. Notify Architect/Engineer minimum 24 hours prior to commencement of operations.
- B. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and waterstops are not disturbed during concrete placement.
- C. Maintain records of concrete placement: Record date, location, quantity, air temperature, and test samples taken.

- D. Place concrete continuously between predetermined expansion, control, and construction joints. Do not interrupt successive placement; do not permit cold joints to occur. Screed slabs on grade level, maintaining surface flatness of max. 1/4 inch in 10 ft.
- E. Remove water and foreign matter from forms and excavations and, except in freezing weather or as otherwise directed, thoroughly wet wood forms just prior to placing concrete. Place no concrete on frozen soil and provide adequate protection against frost action during freezing weather.
- F. Verify that grade, when consisting of fill materials, has been sufficiently improved by compaction or replacement, is sufficient to support wet weight of concrete until fully cured. Report any unsuitable grade materials to the project superintendent for remediation.
- G. To secure full bond at construction joints, surfaces of concrete already placed, including vertical and inclined surfaces, shall be thoroughly cleaned of foreign materials and laitance, roughened with suitable tools such as chipping hammers or wire brushes, and recleaned by stream of water or compressed air. Well before new concrete is deposited, joints shall be saturated with water. After free or glistening water disappears joints shall be given thorough coating of neat cement slurry mixed to consistency of very heavy paste. Surface shall receive coating of approximately one-eighth inch thick; this shall be scrubbed in by means of stiff bristle brushes. New concrete shall be deposited before neat cement dries or changes color.
- H. Do not place concrete having slump outside of allowable slump range.
- I. Transport concrete from mixer to place of final deposit as rapidly as practical by methods which prevent separation of ingredients and displacement of reinforcement, and which avoid rehandling. Deposit no partially hardened concrete. When concrete is conveyed by chutes, equipment shall be of such size and U-shaped design as to insure continuous flow in chute. Flat (coal) chutes shall not be employed. Chutes shall be of metal or metal lined and different portions shall have approximately same slope. Slope shall not be less than 25 degrees nor more than 45 degrees from horizontal and shall be such as to prevent segregation of ingredients. Discharge end of chute shall be provided with baffle plate or spout to prevent segregation. If discharge end of chute is more than five feet above surface of concrete in forms, spout shall be used, and lower and maintained as near surface of deposit as practicable. When operation is intermittent, chute shall discharge into hopper. Chute shall be thoroughly cleaned before and after each run and debris and any water used shall be discharged outside forms. Concrete shall not be allowed to flow horizontally over distances exceeding five feet.
- J. Concrete shall be placed in such manner as to prevent segregation, and accumulations of hardened concrete on forms or reinforcement above mass of concrete being placed. To achieve this end, suitable hoppers, spouts with restricted outlets and tremies shall be used as required.
- K. During and immediately after depositing, concrete shall be thoroughly compacted by means of internal type mechanical vibrators or other tools, or by spading to produce required quality of finish. Vibration shall be done by experienced operators under close supervision and shall be carried on only enough to produce homogeneity and optimum consolidation without permitting segregation of constituents or "pumping" of air. Vibrators used for normalweight concrete shall operate at speed at not less than 7,000 vpm and be of suitable capacity. Do not use vibrators to move concrete. Vibration shall be supplemented by proper wooden spade puddling to remove included bubbles and honeycomb adjacent to visible surfaces. At least one vibrator shall be on hand for every 10 cubic yards of concrete placed per hour, plus one spare. Vibrators shall be operable and on site prior to starting placement.
- L. Vertical lifts shall not exceed 18 inches. Vibrate completely through successive lifts to avoid pour lines. Vibrate first lift thoroughly until top of lift glistens to avoid stone pockets, honeycomb, and segregation.

- M. Concrete shall be deposited continuously, and in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within section. If section cannot be placed continuously between planned construction joints, as specified, field joint and additional reinforcement shall be introduced so as to preserve structural continuity. Designer shall be notified in any such case.
- N. Cold joints, particularly in exposed concrete, including "honeycomb", are unacceptable. If they occur in concrete surfaces exposed to view, Designer will require that entire section in which blemish occurs be removed and replaced with new materials at Contractor's expense.
- O. When placing exposed concrete walls, strike corners of forms rapidly and repeatedly from outside along full height while depositing concrete and vibrating.
- P. Chutes, hoppers, spouts, adjacent work, etc. shall be thoroughly cleaned before and after each run and water and debris shall be discharged outside form.

3.06 FORM REMOVAL

- A. Contractor shall be responsible for proper removal of formwork, shoring, and reshoring.
- B. Forms shall be removed only after concrete has attained sufficient strength to support its shown weight, construction loads to be placed thereon and lateral loads, without damage to structure or excessive deflection. Forms and supports shall remain in place for not less than minimum periods of time noted below. These periods represent cumulative number of days or fractions thereof, consecutive unless otherwise approved by Designer during which time mean daily air temperature at surfaces of concrete is above 50 degrees F.
 - Vertical surfaces: concrete shall have reached 100 day-degrees (#) and shall have attained strength of not less than 30 percent of f_c. Where such forms also support formwork for slab or beam soffits, removal times for latter shall govern.
 - (
 - #) Definition of day-degrees: Total number of days times mean daily air temperature at surfaces of concrete. For example, five days at temperature of 60 degrees F. equals 300 day degrees. Days or fractions of days in which temperature is below 50 degrees F. shall not be included in calculation of day-degrees
- C. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- D. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

3.07 REPAIRING OF UNFORMED CONCRETE SURFACES

- A. Tops of slabs and walls shall be repaired by using either same material as originally cast or by use of dry-pack material, as approved by Designer. Areas affected shall be chipped back square and to depth of one inch minimum. Hole shall then be moistened with water for a minimum of two hours, followed by brush coat of 1/16 inch thick cement paste. Immediately plug hole with concrete, or with dry pack material consisting of 1:1.5 mixture of cement and concrete sand mixed slightly damp to touch. Hammer dry-pack into hole until dense, and excess paste appears on surface. Finish patch flush and to same texture as surrounding concrete. For large repairs employ 1-1-2 mixture of cement, concrete sand and pea gravel at same dry-pack consistency.

- B. Contractor, at his own expense, shall level depressed spots and grind high spots in concrete surfaces which are in excess of specified tolerances. Leveling materials proposed for providing proper surface shall be approved by Designer.

3.08. CONCRETE FINISHING, CURING AND PROTECTION

- A. Provide formed concrete surfaces to be left exposed concrete walls with smooth rubbed finish.
- B. Finish concrete floor surfaces in accordance with ACI 301. Elevator pit slab and mechanical slabs shall have a Broom finish. Interior slabs for finished spaces shall have a steel trowel finish.
- C. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- D. Cure floor surfaces in accordance with ACI 308, maintaining 100 percent coverage of water over floor slab areas continuously for 4 days. Spray water over floor slab areas and maintain wet for 7 days.
- E. When concrete is placed at or below ambient air temperatures of 40 degrees F. or whenever in opinion of Designer, such or lower temperatures are likely to occur within 48 hours after placement of concrete, cold weather concreting procedures, according to ACI 306 and as specified herein, shall be followed. To this end, entire area affected shall be protected by adequate housing or covering, and heating. No salt, chemicals or other foreign materials shall be used in the mix to lower freezing point of concrete.
- F. Protect concrete work against injury from heat, cold, and defacement of any nature during construction operations.
- G. Concrete shall be treated and protected immediately after concreting or cement finishing is completed, to provide continuous moist curing above 50 degrees F. for at least seven days, regardless of ambient air temperatures.
- H. Keep permanent temperature record showing date and outside temperature for concreting operations. Thermometer readings shall be taken at start of work in morning, at noon, and again late in afternoon. Locations of concrete placed during such periods shall likewise be recorded, in such manner as to show any effect temperatures may have had on construction. Copies of temperature record shall be distributed to the Designer.

3.09. CLEANING

Concrete surfaces shall be cleaned of objectionable stains as determined by the Designer. Materials containing acid in any form or methods which will damage "skin" of concrete surfaces shall not be employed, except where otherwise specified.

END OF SECTION

SECTION 05500

MISCELLANEOUS METAL FABRICATIONS

PART 1.00 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include GENERAL CONDITIONS and applicable parts of Division 1 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 WORK TO BE DONE

- A. Furnish all materials, equipment, labor and services required for all miscellaneous metal work as specified herein, as indicated on Drawings, or both, including miscellaneous standard steel shapes, bars, plates and accessories shown on architectural drawings, which are not part of structural, site, mechanical or electrical work.
- B. Whether or not shown on the drawings, work also includes providing steel sub-sill supports for elevator entrances.
- C. Work also includes repair and replacement of miscellaneous metal items, where shown on the drawings.
- D. It is not the intent herein to describe all the items of light iron and miscellaneous metal work required for the Work. All light iron and miscellaneous metals not specified under another Section but required for the Work shall be provided under this Section.
- E. Provide specific metal fabrications itemized in this Section or on the drawings, including vertical ladders, stairs, stair nosings, steel railings.
- F. Furnish all required metal inserts, anchor slots, anchors, anchor bolts, fastenings, etc., for attachment of work of all trades to concrete and masonry, except where otherwise specified or obviously included under other Sections of the Specifications.
- G. See Drawings for locations and details.

1.03 RELATED WORK UNDER OTHER SECTIONS

- A. Painting, except as specified herein.
- B. Masonry work, including installation of loose lintels.
- C. Finish hardware.

- D. Miscellaneous angles, channels and the like required to suspend mechanical and electrical work.
- E. Removal of existing work.
- F. Concrete reinforcing.
- G. Metal flashing.
- H. Building specialties; including roof hatches and access panels.
- I. Masonry ties, reinforcement and anchors.
- J. Rough hardware for carpentry work, except as otherwise specified herein.

1.04 REFERENCE STANDARDS

- A. Work shall conform to codes and standards of the following agencies as further cited herein:
 - ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.
 - AISC: American Institute for Steel Construction, 101 Park Avenue, New York, NY including "Code of Standard Practice for Steel Buildings and Bridges"; "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings".
 - AISI: American Iron and Steel Institute, 100016th Street, N.W., Washington, DC 20036 including "Specifications for the Design of Light Gauge Cold Formed Structural Members".
 - AWS: American Welding Society, Inc., 2501 NW 7th Street, Miami, FL 331 25, "Standard D1 .1-72, Structural Welding Code". AAMA: Architectural Aluminum Manufacturers Association, 410 North Michigan Avenue, Chicago, IL 60611.
 - SSPC: Steel Structures Painting Council, -4400 Fifth Avenue, Pittsburgh, PA 1 521 3, as published in Volumes 1 and 2 of "SSPC Manual".
 - FS: Federal Specifications published by the United States Government, available from General Services Administration, Specification and Consumer Information Distribution Service, Washington Navy Yard Building 1 97, Washington, DC.
- B. Gauges of sheet iron and steel as specified are U.S. Standard for sheet and plate. Gauges of non-ferrous metals are Browne and Sharpe.

1.05 SHOP DRAWINGS AND SAMPLES

- A. Prepare and submit Shop Drawings in accordance with requirements of Division 1 for Architect's review before proceeding with fabrication.
- B. Take measurements in the field and verify all dimensions before submitting Shop Drawings.
- C. Shop Drawings shall show all items in large scale detail with kind of materials, size of members and methods of securing same together and to work of other trades. Shop Drawings shall be fully dimensioned and show relationship to adjacent materials. Each field piece shall be marked and markings indicated on Shop Drawings.
- D. Where provisions must be made for attaching other materials to work included under this Section or

where provisions must be made for assembly and installation of steel and miscellaneous iron in the field, the required holes shall be provided in the shop, unless such connections are to be welded. The sizes and locations of all such holes shall be shown on the Shop Drawings. Such holes shall be either drilled or punched and reamed.

E. Samples: Submit samples as required by the Architect of all materials specified herein in accordance with requirements of Division 1 for Architect's review before ordering materials. Provide special samples of pipe railings, elbows and connections.

F. Data: Provide manufacturer's data on manufactured products and mill reports on steel.

G. Certification: Submit written certification of conformance to requirements for galvanizing and shop priming. Submit certification evidence for all welders on the job.

H. Calculations: Submit complete stair, grating, handrail, ladder, bridge and catwalk design and attachment calculations stamped with the seal of a professional engineer licensed in New Jersey and indicating compliance with specified and code-prescribed load requirements.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver and store work under this Section in a manner to prevent wracking or stress of components, and to prevent mechanical damage or damage by the elements.

B. Items which become rusted or damaged because of non-compliance with these conditions will be rejected and shall be replaced without additional cost to the Owner.

C. Deliver work to the site in sufficient time to avoid delay in job progress and at such times as to permit proper coordination of the various parts.

D. Deliver anchor bolts, washers, and other anchorage in time for building-in. Deliver bolts, and other small items required for erection of work under this Section undled with their respective items.

E. Hot-dip galvanized steel shall be marked with a stamp indicating ASTM number and weight of coating and shall be inspected for compliance with applicable ASTM requirements.

1.07 COORDINATION

A. The work of this Section shall be coordinated with the work of other Sections. Verify dimensions and work of other trades which adjoin materials of this Section before installing items specified.

B. Obtain all necessary templates and patterns required from other trades for proper execution of work of this Section. Furnish to other trades items to be built into work of other Sections. Supervise installation of such built-in work.

PART 2.00 – MATERIALS

2.01 MATERIAL REQUIREMENTS

A. Provide only new materials, free from defects impairing strength, durability, and appearance, and of

the quality specified.

- B. Standard products meeting the detailed requirements specified herein will be considered for acceptability by the Architect.
- C. Furnish all supplemental parts necessary to complete each item whether or not such parts are shown and specified. Furnish all fastenings for securing the work required hereunder.
- D. Provide fastenings of the same material, color, and finish as the metal to which applied unless otherwise indicated.

2.02 METALS

- A. Steel shapes, plates and bars: Shall conform to the requirements of Standard Specification for Steel for Bridges and Buildings, ASTM A36.
- B. Sheet Steel: Prime grade cold-rolled steel properly annealed and process-leveled and having smooth, clean surfaces, ASTM A-246.
- C. Steel tubular members: Shall conform to the requirements of ASTM ASOI, in sizes as indicated on the Drawings.
- D. Steel Pipe: Schedule 40 seamless steel, of sizes indicated on the Drawings, galvanized when used on exterior, ASTM A53 or A1 20.
- E. Pipe Sleeves: Hot-dipped galvanized steel having inside dimension ~ 1/4" greater than outside diameter of post to be inserted therein.
- F. Hydraulic cement for installing bolts and fastenings into masonry and concrete and for setting pipe posts into sleeves and cements: Quick setting, non-staining, non-shrinking type, as approved.
- G. Wrought Iron: Shall conform to ASTM A1 89, for single and double-refined wrought iron bars.
- H. Steel bolts and nuts shall conform to ASTM B-6.
- I. Filler Metal for Welding: Welding electrodes for manual shielded metal arc welding shall conform to ASTM A233, E60 or E70 Series. Bare electrodes and granular flux used in the submerged-arc process shall conform to AISC Specifications.
- J. Construction accessories shall be by Hohmann and Barnard, Gateway Erectors, Inc., Richmond Screw Anchor Co., or equal. All accessories shall be heavily hot-dip galvanized.
- K. Stainless Steel shall be AISI Series 300 austenitic alloys: Type 304 where exposed, Types 305 for bolts, nuts, screws and fasteners. All other stainless steel shall be Type 302 of shapes as required. Provide standard dull mill finish except as otherwise indicated.

2.03 PAINTING AND PROTECTION

- A. Shop Priming: All ferrous metal surfaces, except pre-finished items, stainless steel, galvanized

items and those obviously not to be painted, shall, before leaving the shop or manufacturing plant, be cleaned of all scale, rust, grease and other foreign matter and shall be given one thorough shop coat on all surfaces of an approved metal primer ready and compatible for finish painting at the building site under PAINTING Section, except surfaces which are to be welded. Apply paint thoroughly and evenly on the surfaces and work into joints and other open areas on the surfaces. Surfaces inaccessible after assembly shall be given two coats.

B. Primer: Shall be Tnemec Series 59 Varaprime Universal primer (applied at 2.5 mils dry film thickness per coat) or equal by manufacturer listed under PAINTING Section, shall be suitable for substrate to which applied; shall be compatible with high performance coatings and other materials to be used infield painting; and shall be used directly from factory-labeled containers. Touch up damaged and abraded spots after installation using the same paint. Steel fully embedded in concrete shall be left unpainted.

C. Thoroughly protect all non-ferrous items in contact with dissimilar metals, concrete, masonry and mortar with approved bituminous coating on contact surfaces.

2.04 GALVANIZING

A. All ferrous metal exposed to the weather, all ferrous metals attached to or embedded less than two inches in exterior concrete or masonry, including loose lintels, shall be hot-dip galvanized after fabrication and chromated after galvanizing by dipping in a .15% chromic acid solution. Galvanizing bath shall be a combination nickel-zinc mixture "Ni-Galv" or equal. Galvanize all ferrous fasteners, clips, sleeves, anchors, and accessories in contact with galvanized items.

B. Galvanizing: Shall comply with ASTM A123, minimum 3.4 dry mu thickness, except as follows:

Steel pipe:	A120	
Structural Steel Shapes:	A123	
Assembled steel products:		A386
Steel sheets:	A525	

C. All galvanized materials shall be inspected for compliance with these specifications and marked with a stamp indicating the name of the galvanizer, the ASTM Specification and the weight of the zinc coating in ounces per square foot.

D. A notarized statement of compliance with specifications shall be furnished by the galvanizer with the initial shipment.

E. Items to be galvanized shall be galvanized after fabrication. Where size of assembly is too large for complete unit galvanizing, assemblies shall be galvanized prior to fabrication in as large sections as practical and then only with the written permission of the Architect.

F. Shop-prime all galvanized exterior railings and other material scheduled to be field-painted with a two-component epoxy-based primer within 12 hours of galvanizing, minimum 3.0 dry mil thickness, per Duncan Primergalv 100 process. Provide a notarized certificate of compliance with primer specifications.

G. Where galvanizing prior to completing fabrication cannot be avoided, joints shall be welded after fabrication, ground smooth and finished with four (4) full coats of California Products WW Totrust, Sealube ZRC, Zirp by Duncan or equal.

2.05 WELDING

- A. The AWS standard code of Arc and Gas Welding shall govern all welding under this Section.
- B. Welding shall be continuous except where tack-welding is specifically permitted. Tack welding will not be permitted on exposed surfaces. All exposed welds shall be ground smooth.
- C. Where structural joints are made by welding, the details of all joints, the techniques of welding employed, the appearance and quality of welds made, and the methods used to correct defective work shall conform to the requirements of the AISC and AWS Codes.
- D. Welds shall be made only by certified welders who have previously been qualified by tests as prescribed in AWS "Standard Qualification Procedure" for the type of work required.
- E. Weld with uncoated wire to prevent flux deposits. All flux residue shall be removed to bare white metal. Seal off contact areas of overlapping surfaces by welding full perimeter of contact areas.
- F. Take all necessary precautions when welding to prevent fires. Maintain fire extinguishing equipment on hand at all times and ready for immediate use.

2.06 LOOSE LINTELS

- A. All loose lintels shall be provided under this Section in accordance with the following schedule, unless shown otherwise on the drawings. In general, supply one (1) angle for each 4" thickness of masonry. At 6" masonry walls use WT sections with properties equal to or greater than 1-1/2 times angle properties for 4" wall thickness. Longer leg shall be set vertically. Install lintel over each masonry opening.
- B. For openings up to 3'-0" wide: 3-1/2" x 3-1/2" x 5/16" angle
For openings 3'-0" to 4'-6": 4" x 3-1/2" x 5/16" angle
For openings 4'-6" to 6'-0": 5" x 3-1/2" x 5/16" angle
For openings 6'-0" to 8'-0": 6" x 3-1/2" x 5/16" angle
- C. Length of lintel shall be masonry opening plus 16".

2.07 SHELF ANGLES FOR ELEVATOR SUB-SILLS: as detailed or as recommended by elevator manufacturer; minimum 3" x 3" x 1/4", extending full width of elevator sill.

2.08 ARCHITECTURAL METAL ACCESS PANELS

- A. Manufactured by Bar-Co, Inryco/Milcor, Karp, JL, Nystrom, Wilkinson, or Williams, of appropriate type for wall or ceiling material in which doors are being installed.
- B. Construction: 16 ga. steel frame and 14 ga. panel, white baked enamel shop primer, sizes as shown on drawings.
- C. Mount doors flush with finished surface, on frames with concealed spring hinges which open to 175 degrees, preventing impact with surface. Panels shall be removable by taking pin out or hinge leaf. Locks: flush, screwdriver-operated with cam.
- D. Where shown or required, provide fire-rated doors with UL 1-1/2-hour B label, with automatic

closing mechanism, construction generally as specified above.

E. All access panels shall be keyed alike.

2.09 MISCELLANEOUS ITEMS

A. **Items Included:** Carefully review all Drawings for miscellaneous metal items. Furnish and install miscellaneous metal items required by the various trades, whether or not specifically listed herein, such as miscellaneous clip angles, miscellaneous steel brackets, and other miscellaneous metal items as indicated on the Drawings, reasonably implied therefrom, or reasonably necessary for the thorough completion of the Work. Include the following miscellaneous metal items as well as all other items required.

B. **Shelf-angles and Lintels:** Provide shelf angles and lintels as required for recessed cabinets, access panels, recessed accessories, interior louver openings, door frames, counter supports, counters, and cabinetwork.

C. **Sleeves and Inserts:** Include steel sleeves and miscellaneous steel anchor bolts as required, clip angles, anchors, fasteners, sockets and accessories required to complete the proper installation of all items of this Section, whether indicated or not.

PART 3.00 – EXECUTION

3.01 WORKMANSHIP

A. All work shall be executed by experienced mechanics and shall conform to details, be clean and straight with sharply defined profiles. Unless otherwise particularly noted, finished surfaces shall have smooth finish.

B. Curved work shall be formed to true radii. Shearing and punching shall be done cleanly so as not to deform or mar adjacent surface.

C. Shop connections shall be welded or riveted, and field connections bolted unless otherwise indicated. Use flathead countersunk rivets finished flush where riveted connections are exposed to view in finished work. Bolts shall be turned up tight and threads deformed to prevent loosening.

D. Castings shall be sound and free from warp, holes and other defects that impair strength and appearance. Exposed surface shall have a smooth finish with sharp well-defined lines and arises. Machined joints shall be milled to a close fit. Provide all necessary lugs, brackets and similar items so that work can be assembled and installed in a neat, substantial manner.

E. Provide holes and connections as required to accommodate the work of other trades and for site assembly of metal work. Holes shall be drilled or punched and reamed in the shop. Show sizes and locations of all such holes on the Shop Drawings.

F. Joints and connections exposed to weather shall be formed to exclude water.

G. All materials and workmanship under this Section shall be subject to inspection in the mill, shop or field by the Architect or by qualified inspectors retained by the Owner. Inspection shall be without expense

to the Contractor. However, such inspection, wherever conducted, shall not relieve Subcontractor of his responsibility to furnish materials and workmanship in accordance with Contract requirements.

H. Shop fabricate items wherever practicable, accurately fitting all parts and making all joints tight.

I. Grind all edges of bars and plates completely free from nicks and machine marks prior to galvanizing and/or shop priming.

J. Draw up all threaded connections tightly after buttering same with pipe joint compound to exclude water.

K. Countersink all screw heads and bolt heads as far as practicable. Use not less than two screws, bolts, or other anchorage items at each connection point.

L. Use only screws and bolts of sufficient size to assure against loosening from normal usage of miscellaneous metal items furnished hereunder.

M. Attach handrails in a manner which will ensure the rails will be capable of withstanding 200 pound concentrated load applied at any point downward or horizontally.

N. Welding shall be continuous except where tack-welding is specifically permitted. Tack welding will not be permitted on exposed surfaces. All exposed welds shall be ground smooth.

O. Where structural joints are made by welding, the details of all joints, the techniques of welding employed, the appearance and quality of welds made, and the methods used to correct defective work shall conform to the requirements of the AISC and AWS Codes.

P. Welds shall be made only by certified welders who have previously been qualified by tests as prescribed in AWS "Standard Qualification Procedure" for the type of work required.

Q. When securing railing posts into pipe sleeves, shim 4 sides with lead wedges and fill joint between post and sleeve with hydraulic cement level with surrounding surface.

3.02 SHOP PAINTING

A. Prepare surfaces prior to galvanizing and priming. Thoroughly clean steel of all loose mill scale by power wire brushing or sandblasting. Remove all rust, dirt, weld flux, weld splatter, and other foreign matter by wire brushing or scraping (power wire brushing, if necessary). Grind smooth any sharp projections. Remove oil and grease deposits with solvent.

B. Touch Up: After erection, touch up all paint abrasions and field welds with same primer and paint used on shop coat.

C. Certification: Prior to commencing installation of materials required hereunder, furnish written and signed certification that the specified requirements pertaining to galvanizing and shop painting have been performed in the manner specified.

3.03 INSTALLATION

- A. Take all measurements required at the building. Check measurements, compare dimensions and other data with various trades installing adjoining work to assure proper coordination.
- B. Do all drilling and fittings, cutting, welding, bolting and riveting required to erect, install and fit metal work to adjoining work. Conform to AISC Code. Furnish all screws, bolts, anchors, etc., required to attach metal work securely to adjoining work.
- C. Do not cut or alter members in the field without approval. Do not enlarge unfair holes by burning and forcing, but correct by reaming.
- D. Contractor shall be responsible for the correct location of miscellaneous metal work, including anchor bolts and base plates, lintels and angles. Take particular care to maintain steel shapes, plumb and level during the pouring of concrete.
- E. Store materials in conformance with general provisions of Section OI 600, Products and Installation. Store materials on skids, not on ground, in such fashion as to prevent bending, twisting or similar damage.
- F. Erect products plumb and true, well-aligned with other building elements, and securely attached in place. Tolerances shall comply with applicable reference standards specified in Division 5 structural steel Section. Use attachments galvanically compatible with materials being installed, or separated therefrom with mastic or rubber washers.
- G. Secure metal items to masonry and concrete using toggle or expansion-type stainless, cadmium plated or galvanized steel anchors, minimum 1/4 in. in diameter, 24 in. o.c. Power-driven pins may be used at concrete. Furnish inserts, anchors and other recessed items as required for installation in masonry and concrete under Divisions 3 and 4.
- H. All metal work shall be well-formed to shape and size, with sharp lines or angles. Shearing and punching shall leave clean, true lines and surfaces. Weld permanent connections. Do not use screws or bolts where they can be avoided; where used, heads shall be countersunk, screwed up tight and threads dressed close to nuts and nicked to prevent loosening. Curved work shall be evenly sprung.
- I. Castings shall be sound and free from warp, holes and other defects that impair their strength or appearance. Exposed surfaces shall have a smooth finish and sharp, well-defined lines and arises. Machine joints, where required, shall be milled to a close fit. Provide necessary rebates, lugs and brackets so that work can be assembled in a neat and substantial manner.
- J. Make field connections in most practical locations for appearance, maintenance and ease of installation. Conceal joints and attachments to extent possible. Reinforce members and punch or drill as required for securing other materials. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Joints exposed to weather shall be formed to exclude water. Provide holes and connections for the work of other trades. Exposed fastening shall match base material and finish.
- K. Touch up damaged shop coat using original or zinc-rich primer. Apply a thick coat of bituminous or zinc-chromate paint to concealed metal surfaces in contact with masonry, concrete or dissimilar metals.
- L. Touch up breaks in galvanized surfaces caused by field cuts, welds, hole-drilling, etc., per ASTM A 780. Apply first coat within two hours after break in galvanizing occurs. At welds, power-wire brush off weld

spatter, flux and slag, and apply two coats of galvanizing compound extending 3 in. beyond edges of burned-off galvanized area.

M. Clean installed work from crayon marks, weld spatter, chalk dust, dirt and other foreign materials, ready for field painting. Protect installed work as required from damage by subsequent building operations.

N. Welding, where required, shall be neat and surrounding metal shall not be burned. All exposed-to-view welds shall be ground down flush and smooth.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

1.00 GENERAL

1.01 References: General provisions of contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 WORK INCLUDED

A. The work under this Section consists of furnishing and installing all rough carpentry and related work as shown on the drawings and as specified herein and includes, but is not limited to, the following:

1. Structural wall and roof framing.
2. Built-up structural beams and posts.
3. Manufactured Wood Products.
4. Wall sheathing.
5. Preservative treatment of wood.
6. Miscellaneous framing and sheathing.
7. Concealed wood blocking and grounds for support of wood trim.
8. All wood bracing, miscellaneous jobbing, cutting and patching.
9. Rough hardware items.
10. Wood treatment.
11. Cutting and patching of wood floors, roof and walls for work of other trades.

1.03 REFERENCES

A. Reference the following codes and standards as apply to each specific application.

1. AHA (American Hardboard Association) A135.4 - Basic Hardboard.
2. ALSC (American Lumber Standards Committee) - Softwood Lumber Standards.
3. ANSI A208.1 - Mat-Formed Wood Particleboard.
4. APA (American Plywood Association).

5. ASTM (American Society of Testing and Materials) D245 - Standard Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber.
6. AWPA (American Wood Preservers Association) C1 - All Timber Products - Preservative Treatment by Pressure Process.
7. AWPA (American Wood Preservers Association) C20 - Structural Lumber Fire Retardant Treatment by Pressure Process.
8. MSBBRS (Massachusetts State Board of Building Regulations and Standards) - Grading Agency Certification
9. MWPA (Massachusetts Wood Producers Association) - Grading Rules
10. NELMA (Northeast Lumber Manufacturer's Association) - Grading Rules
11. NFPA (National Forest Products Association).
12. NLGA (National Lumber Grades Authority).
13. SPIB (Southern Pine Inspection Bureau).
14. WCLIB (West Coast Lumber Inspection Bureau).
15. WWPA (Western Wood Products Association)

1.04 QUALITY ASSURANCE

- A. Provide at all times during the Work of this Section adequate supervisory personnel who shall be thoroughly familiar with the type of construction involved and with the requirements of the Contract Documents pertinent to this Work. Provide adequate numbers of skilled craftsmen and other personnel to ensure the orderly and proper progress of the Work in accordance with the approved Progress Schedule.
- B. Lumber standard: Comply with PS20 for each indicated use, including moisture content and actual sizes related to the indicated nominal sizes, except as otherwise indicated.
- C. Plywood standard: Comply with PSI-74, or for products not manufactured under PSI provisions, with applicable AP Performance Standards for type of panel indicated.
- D. Factory mark each piece of concealed lumber with type, grade, mill and grading agency identification, or submit letter or certificate of compliance.

1.05 PRODUCT HANDLING

- A. Keep carpentry materials dry during delivery, storage and handling. Store lumber and plywood in stacks, with provision for air circulation within stacks. Protect bottom of stacks against contact with

damp surfaces. Protect exposed materials against weather, covering and blocking above ground.

1.06 JOB CONDITIONS

- A. Coordinate location of furring, nailers, blocking, grounds and similar supports so that attached work will comply with design requirements.
- B. Installer must examine the substrates and supporting structures and the conditions under which the carpentry Work is to be installed, and notify the General Contractor in writing of conditions until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- C. Coordinate location of furring, nailers, blocking, grounds and similar supports so that attached Work will comply with design requirements.

1.07 SUBMITTALS

- A. Submit full Product Data of all manufactured or proprietary items and certification of compliance with these requirements for all items to be furnished exactly as specified.

2.00 MATERIALS

2.01 WOOD PRODUCTS

- A. Lumber Grading Rules: NFPA, RIS, SPIB, WCLIB or WWPA.
- B. Lumber shall be marked S-Dry to 19% moisture content unless otherwise noted. All materials shall be inspected before use, with all checked, split, and otherwise deficient stock rejected, or used only for miscellaneous blocking, furring or other incidental use. The Contractor shall be responsible for replacing all members which, due to warpage, twist, splitting or checking, result in unsatisfactory Work. Such replacement shall be required at any time, whether before or after application of finish materials under other Sections.
- C. Provide wood blocking, nailers and curbs as indicated or required, using Douglas Fir, Spruce, Hemlock or Southern Pine, Stud grade or merchantable grade. Wood member shall be of the sizes indicated on the drawings.
- D. Structural Framing (2 to 4 in. thickness, 5 in. and wider): No. 2 and Better construction grade, meeting the following minimum base values:
 - F_b (extreme fiber stress in bending): 1100 psi (repetitive use), 950 (single use)
 - F_t (tension parallel to grain): 500 psi
 - F_v (horizontal shear): 75 psi
 - F_c (compression perpendicular to grain): 400 psi
 - F_c (compression parallel to grain): 1200 psi
 - E (modulus of elasticity): 1,400,000 psi

2.02 ENGINEERED LUMBER

- A. Laminated Veneer Lumber (LVL): Laminated veneer lumber for LVL Beams shall be engineered lumber equal to G-P Lam LVL, manufactured by Georgia-Pacific Corporation; GangLam LVL,

manufactured by Louisiana-Pacific; Trus-Joist, manufactured by MacMillan-Bloedel Limited; or approved equal. LVL shall conform to the following:

1. Modulus of Elasticity (E): 2,000,000 psi.
2. Shear Modulus (G): 125,000 psi.
3. Flexural Stress (Fb): 2925 psi.
4. Horizontal Shear (Fv): 285 psi.
5. Compression perpendicular to grain: 750 psi.
6. Compression parallel to grain: 2725 psi.

B. Parallel Strand Lumber (PSL) Columns:

1. Modulus of Elasticity (E): 2.0×10^6 psi.
2. Shear Modulus (G): 125,000 psi.
3. Flexural Stress (Fb): 2900 psi.
4. Horizontal Shear (Fv): 290 psi.
5. Compression perpendicular to grain: 650 psi.
6. Compression parallel to grain: 2900 psi.

2.02 SHEATHING MATERIALS

- A. Plywood Wall Sheathing: APA Rated Sheathing, Span Rating 32/16; Exposure Durability 1; species group 1 through 4.
- B. Cement Board Sheathing: at fire-rated exterior walls; 1/2" cementitious backer units; 36" wide-5', 8' long; Edge Profile: Formed Smooth, Square; Weight: 2.4 lbs./sq. ft; UL designation DCB
- C. Floor Sheathing: A.P.A. Sturd-I-floor tongue and groove with exterior glue. Thickness and panel index as indicated.
- D. Roof Sheathing: A.P.A. CD interior with exterior glue. Thickness and panel index as indicated.
- E. Wall Sheathing: A.P.A. CD interior with exterior glue. Thickness and panel index as indicated.
- F. Plywood shall conform to the requirements of APA Design/Construction Guide, Residential and Commercial.
- G. Non-plywood type performance-rated construction panels shall meet or exceed APA PRP-1 08. Provide APA Rated Sheathing, Exposure 1, for wall sheathing, roof sheathing, and subflooring.

2.03 WOOD PRESERVATIVE TREATMENT

- A. All wood exposed to water, in contact with masonry or concrete, installed on exterior, or in cavities of masonry walls, or within 12 inches of adjacent grade shall be pressure treated in accordance with the American Wood Preservation Institute. All exterior wood items, all wood items in contact with exterior concrete or masonry, all wood in contact with earth or floor slab, and all wood in roof areas shall be treated.
- B. Pressure preservative treatment of all lumber shall conform to the American Wood Preservatives

Institute (AWPI) Standard LP-22, equivalent to 0.40 lbs/cu. ft. CCA (above ground, ground contact) and shall bear the quality make of an agency authorized to inspect treated wood products.

C. All wood products shall be dried to the moisture contents herein specified (but not more than 19%) and to the grade requirements of the respective grading authority after treatment.

D. Treat cuts, holes and machined areas in accordance with AWPA Standard M4.

2.04 ROUGH HARDWARE

A. Fabricated hardware items shall be by Teco, Simpson, Heckman or Silver as approved by the Architect. In exterior areas or where in contact with concrete, rough hardware shall be hot-dip galvanized. In other areas electrogalvanizing will be acceptable. Select products for size of members joined or supported and to develop the full strength of the members, as directed by the Architect or shown on the drawings.

B. Anchorage and Fastening Materials: Select proper type, size, material and finish for each application. Materials for Work within exterior construction shall be galvanized.

1. Nails and Staples: Galvanized, hardened steel conforming to Federal Specification FF-N-105B. Use common wire nail lengths and diameters unless noted. Threaded, hardened steel nails may be substituted for common size nails of corresponding size. Use annular-ring, common-wire, galvanized nails for plywood.
2. Tacks: Fed. Spec. FF-S-111.
3. Wood Screws: Fed. Spec. FF-N-103.
4. Bolts and Studs: Fed. Spec. FF-B-575.
5. Nuts: Fed. Spec. FF-N-836.
6. Washers: Fed. Spec. FF-W-92.
7. Lag Screws or Lag Bolts: Fed. Spec. FF-B-561.
8. Masonry Anchoring Devices: For expansion shields, nails and drive screws, comply with Fed. Spec. FF-S-325.
9. Toggle Bolts: Fed. Spec. FF-B-588.
10. Standard Connectors (where specified or allowed): Items as manufactured by the Simpson Strong-Tie Company of San Leandro, CA, or approved equal.
11. Bar or Strap Anchors: ASTM A575 carbon steel bars.
12. Engineered Lumber: Fastening (nailing or bolting) of LVL members shall be in accordance with all codes and in accordance with the engineered lumber manufacturer's recommended details and instructions. Where required, provide backup calculations for all connections and

fastenings. Refer to Structural Drawings

- C. Comply with all requirements and recommendations of the SBC for fastener types, sizes and spacings.

2.05 MISCELLANEOUS MATERIALS

- A. Building Paper: ASTM D 226, Type I; asphalt saturated felt, non-perforated, 15 lb. type.
- B. Air Infiltration Barrier: Provide 6.1 mil thick fabric composed of very fine, high density polyethylene fibers with vapor transmission rate of 51.30 grams per 100 sq. in. in 24 hours; weight of 8.81 lbs. per 1,000 sq.ft.; bursting strength of 105 psi; tear resistance of 32.5 lbs for length and 24.8 lbs for width; air porosity of 7.6 seconds; water resistance of 99.3 cm of water head. Product: Tyvek by DuPont Co. or equal.

3.00 EXECUTION

3.01 LAYING OUT WORK

- A. The Contractor shall be responsible for establishing lines and levels in accordance with the conditions of the Contract and general requirements.
- B. Lay out all Work in accordance with the Contract Documents, approved Shop Drawings and completed portions of the Work. Report all discrepancies to the Architect promptly for correction and adjustment. In the event of failure to do so, the Contractor is responsible for correction of any errors, including subsequent applied finishes and other construction.

3.02 INSTALLATION OF FRAMING

- A. Set structural members level and plumb, in correct position.
- B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Place horizontal members, crown side up.
- D. Construct load bearing framing and curb members full length without splices.
- E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists. Frame rigidly into joists.
- F. Field drill all holes and recesses for bolts, lag screws and shear plates. Inject all bolt and lead holes with wood preservative before installing hardware.
- G. Holes for through bolts and lag screw shanks shall be 1/32" greater in diameter than bolt and screw shanks.

- H. Drill lead holes for lag screws to avoid splitting wood. Lead holes shall be properly sized for the threaded diameters and species type in accordance with the NFPA National Design Specification.
- I. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned, or too small to fabricate with minimum number of joint or optimum jointing arrangements, or which are of defective quality with respect to surfaces or sizes
- J. Provide tapered oak shims of at least 1/8" thickness as required for adjustment and to provide solid, firm contact between bearing surfaces where proper fit is not otherwise provided with existing members. Maximum allowable tolerance to be accommodated by shims shall be 3/8" or less.
- K. Make all cut lines plumb and true, to within 1/8" of required dimension. Do not leave any splintered wood or checked end grain exposed to weather or soil.
- L. Make secondary fastenings not otherwise called out on drawings with at least (4) common wire nails or spikes per location, of a length which is four times the thickness of the thinner part joined but not of such length that it will not over-penetrate the thicker part, and of a diameter which is the greatest commonly available for the given length. Provide additional nails to detailed connections as may be helpful to keep them aligned and stable. Nails shall be located to be concealed from plain view.
- M. Cut all mortises and notches with the appropriate tools. Do not overcut or over bore holes, or split the wood.
- N. Make all elevation and planar adjustments to the structure before installing new members.
- O. Install all standard and fabricated metal connectors as indicated.
- P. Leave completed structural framing work exposed for inspection by the Engineer.
- Q. Structural members shall be full-length without splices, and spaced not farther than 16 in. on center, except as may be otherwise specifically indicated on the Drawings

3.03 INSTALLATION OF SHEATHING

- A. Secure sheathing and decking with longer edge perpendicular to framing members and with ends staggered and sheet ends over bearing.
- B. Floor Sheathing: Install tongue and groove plywood panels with face grain perpendicular to floor joists and all end joints supported. Stagger ends of adjacent sheets 4'-0 where possible.
- C. For glue and nailed construction: Install in accordance with APA Construction Guide, "Glued Floor System." Apply 1/4" continuous bead of glue at each joist (two beads at butt joints) immediately before laying floor sheathing. Set and nail sheet leaving 1/6" space

at ends and edges. Apply 3/16" continuous bead in sheet groove before securing tongue and groove fit. Nail with 8d nails 12" on center at all supports in field of panel and 6" on center along panel edges.

- D. Roof Sheathing: Install plywood panels with face grain perpendicular to supports and all end joints supported. Stagger ends of adjacent sheets 4'-0" where possible. Nail at 6" on center along all edges and 12" on center along all intermediate supports unless indicated otherwise. Use 6d nails for 1/2" thickness and 8d nails for greater thickness.
- E. Wall Sheathing (except shear walls): Install plywood panels vertically with all edges supported. Nail 6" on center along all edges and 12" on center along all intermediate supports unless indicated otherwise. Use 6d nails for 1/2" thickness and 8d nails for greater thickness.
- F. Cement Backer Units - at fire rated exterior walls. Install per UL Assembly U303 1 hour rating. Install vertically or horizontally over sheathing with vertical joints centered over studs. All joints offset min. 12 inches from underlying sheathing joints. Fastened to studs and plates with corrosion resistant 2-1/4" long chamfered, ribbed wafer head screws with a min. head dia. of .400 in. or 2-1/4" hot-dipped galvanized roofing nails spaced 8 in. oc.

3.04 MISCELLANEOUS BLOCKING AND CARPENTRY

A. Furring, blocking and backing shall be furnished and installed where required for reception of wall board, formation of architectural features, concealment of pipes, conduits, ducts, attachment for supports for toilet room accessories, building specialties, cabinets and door stops and other fixtures. Contractor shall consult with the trades concerned and set furring and blocking they require.

3.05 MATERIALS INSTALLED BY OTHERS

- A. Coordinate the Work of this Section with all other trades.
- B. Provide all anchors, inserts and other items required to be set in concrete to masonry construction in a timely manner, with all required templates and locating information.
- C. Work improperly coordinated shall be corrected to the satisfaction of the Architect at no additional cost to the Owner.

3.06 ROUGH HARDWARE

A. Furnish and install all stock items of rough hardware, as indicated or required, including clips, anchors, hangers, bolts, ties and plates for connecting wood, concrete, masonry or steel, except as specified to be provided under other Sections.

3.07 FIELD APPLICATION OF WOOD TREATMENT

- A. Apply preservative treatment in accordance with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

3.08 INTENT AND WORKMANSHIP

A. It is not the intent of this Section to herein define the types, sizes or installation methods for each item of Work. Methods of installation, joinery, sizes, spacing of nailers and furring strips, and other information pertaining to the lumber, plywood and other items of required Work, shall be installed in accordance with the details on the drawings for the specified areas involved.

B. Work that is to be finished or painted shall be free from defects or blemishes on surfaces exposed to view that will show after the finish coat of paint is applied. Any material which is in any way defective and not up to specifications for quality and grade for its intended use, or otherwise not in proper condition, shall be rejected and replaced at no cost to the Owner.

3.09 PROTECTION

A. Adequate protection for the public shall be provided by the Contractor, or as directed by the Architect in areas used by the public while Work under this Section is in progress. All such protection shall be so arranged as to maintain legal egress at all times.

3.10 CLEANING

A. Maintain premises in neat, safe and orderly condition during execution of work.

B. Maintain free of accumulations of sawdust, cut ends and debris.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

1.00 GENERAL

- 1.01 REFERENCES: General provisions of Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.
- 1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS
- A. Rough carpentry, including blocking for wall-mounted finish carpentry: Section 06100
- B. Field finishing finish carpentry items: Section 09900.
- 1.03 SUBMITTALS: Issue submittals in accordance with Section 01300, Submittals and Record Documents. Submittals shall include:
- A. Shop drawings on casework and shop-fabricated millwork.:
1. Submit shop drawings in accordance with contract conditions for all cabinets, identified with location, quality grade, type of plastic laminate and finish.
 2. Show cabinets in related and dimensional position with sections either full size or 3 inches equal 1 foot scale.
 3. The contractor shall be responsible for details and dimensions not controlled by job conditions.
 4. Show all required field measurements beyond control of the contractor.
 5. Indicate and dimension locations of joints and special patterns.
- C. Samples of each exposed-to-view wood species, including shop finish where applicable.
- D. Full-size samples:
1. 12 in. long full-size samples of all components required.
 2. Samples shall be approved by Architect before fabrication of entire assembly. Approved samples shall serve as minimum standard for acceptance of completed work.
- 1.04 QUALITY ASSURANCE
- A. Mark each assembled unit of architectural millwork with manufacturer's identification and grade mark, evidencing compliance with indicated AWI quality grade. Locate grade mark on surfaces which will not be exposed after installation. For other items requiring field assembly, a

certification of compliance may be substituted for marking of individual pieces.

2.00 PRODUCTS

2.01 GENERAL

- A. Finish carpentry shall comply with Architectural Woodwork Institute Custom Grade requirements.
- B. Finish Medium Density Overlay Exterior Plywood: APA 303-OL (Overlaid), Exterior exposure durability grade, MDO finish both sides (B-B), no grooving.
- C. Exterior finish wood:
 - 1. Species where scheduled for field painting:
African Mahogany , per AWI Quality Standards, Section 100

except where indicated otherwise on drawings.
- D. Natural Finish Hardwood Plywood
 - 1. Grade and wood material as specified below under Paragraph 2.01, GENERAL, for clear-finished wood.
 - 2. Comply with AWI Quality Standards, Section 500A, Wood Flush Panelling, including provisions covering core construction, minimum thickness, face veneer grade, match within panel face, match between adjacent panels, match between areas.
- E. Interior finish wood:
 - 1. Species where scheduled for field painting:
Mouldings: Clear Pine , per AWI Quality Standards, Section 100.
Where indicated: Poplar , per AWI Quality Standards, Section 100.
 - 2. Species where scheduled for clear natural finish: Clear select quarter sawn sugar maple

2.02 MISCELLANEOUS CASEWORK

- A. This section covers casework at Kitchen 111, Conference Room 210, and Rear Hall 209.
- B. Per AWI Quality Standards, Section 400, Division A -- Wood Cabinets, as applicable; Grade as specified above under Paragraph 2.01, GENERAL.
- C. Plastic laminate clad wood cabinets - Exposed and semi-exposed surfaces: plastic laminate per AWI 400B-S-1; high-pressure laminate at exposed surfaces; high-pressure laminate, polyester/melamine low -pressure laminate panels, or cabinet liner at semi-exposed surfaces.

1. Acceptable high-pressure laminate manufacturers: Domtar, Formica, Laminart, Micarta/Westinghouse, Nevamar, Pionite/Sterling, Wilsonart.
 2. Colors: as selected by Architect.
 3. Grade: high-pressure General Purpose Grade 50.
- D. Exposed and semi-exposed surfaces for natural finish wood cabinets: plain-sawn hardwood veneered plywood, per AWI 400A-S-3; to receive field-applied transparent finish specified in Division 9 painting Section. Species: as specified under 2.01 General above.
- E. Core construction: hardwood-faced plywood medium-density flakeboard, or 45-lb. density particleboard; minimum thickness 3/4 in. unless otherwise detailed on drawings.
- F. Cabinet materials and construction shall conform to AWI Standards specified above, including requirements on following:
- Lumber, surface materials and panel product grades
 - Thickness and materials for cabinet components, including cores for laminate-clad cabinets
 - Edge treatment of exposed and semi-exposed components
 - Joinery and fastening of case body members
 - Fitting of case doors and drawers
 - Joint tolerances
 - Flushness between factory-assembled joints
 - Factory-sanding requirements for surfaces to be field-finished.
- G. Furnish all fillers, closure pieces, trim, etc. as required for a complete finished installation.

2.03 CONTINUOUS WOOD STANDING AND RUNNING TRIM (STOPS, STOOLS OR SILLS, BASES, MOLDINGS, ETC.):

- A. Fabricate in compliance with AWI Quality Standards, Section 300, Grade and material as specified above under Paragraph 2.01, GENERAL. Section thicknesses and profiles: as shown on drawings. Material shall not be finger jointed.
- B. Where abutting or replicating existing moldings, profile of new material must match the existing material exactly. Moldings may require unique cutters to reproduce. This expense should be included in the Contractor's bid.
- C. When running trim over 8 in. in width is laminated together, grain, color and texture shall be uniform.
- D. Trim pieces butt-jointed together shall be identical.

2.04 COUNTER TOPS

- A. Plastic laminate, per AWI Section 1 600C, High-Pressure Decorative Laminate Tops, including provisions for finished assembly thickness (3/4 in. minimum), laminate thickness (0.050 in. minimum), backer sheets for tops, sealing of backsplashes, edge-banding, and joints.
- B. Counter-top core: exterior-grade plywood or high-density particleboard. Joints shall not occur at sink openings. Prime core 1 in. around sink openings.
- C. Self-edge exposed edges of top, backsplash and openings with same laminate used for tops. Unless otherwise noted, provide square applied backsplash, 4 in. high. Edges shall be 1-1/2 in. thick faced with plastic laminate.
- H. Plastic laminate shall be as manufactured by Wilsonart, Formica, or Pionite consisting of 1/16 in. thick plastic laminate sheet. Color: as selected by the Architect from the manufacturer's standard range.
- I. Adhesives shall be as per the plastic laminate manufacturer's written specifications or recommendations

2.05 HARDWARE

- A. All hardware necessary for finish carpentry installation shall be securely installed at the shop except exposed projecting hardware, such as pulls which shall be shop drilled and furnished loose for installation at the site.
 - 1. Shelf standards: K and V No.255 pilaster standard with No.256 shelf supports for library and other shelf units.
 - 2. Provide all rough and finish hardware required for custom casework.
 - 3. Cabinet hardware shall comply with ANSI A1 56.9, Grade 1.
 - 4. Exposed hardware finish: US 4 Satin brass (BHMA 606)

2.06 WOOD SHELVING

- A. Shelving shall comply with AWI Quality Standards, Section 600, Grade and wood material as specified above under Paragraph 2.01, GENERAL.
- B. Shelving shall be 3/4 in. thick minimum, fabricated of hardwood-faced veneer plywood (no coreboard permitted) at natural wood finish casework. Edge-band shelving with solid hardwood matching plywood face veneer.
- C. Shelving support: Where adjustable shelving is end-supported in a recess or a cabinet, provide K&V 255-256 adjustable slotted pilaster support combination, finish as specified above.

3.00 EXECUTION

3.01 INSTALLATION

- A. Store and install materials in conformance with general provisions of Division 6 rough carpentry

Section; and AWI Quality Standards Section 1700, Installation of Architectural Woodwork.

- B. Verify that substrates are plumb, level and structurally adequate to support finish carpentry installation, as specified in Division 6 rough carpentry Section.
- C. Prime, stain or seal finish wood required to be job-finished immediately upon delivery to job, including edges, ends, faces, undersides and backsides.
- D. Install finish carpentry items straight, true, level and plumb, firmly anchored in place. Shim items as required using concealed shims. Install to a tolerance of 1/8 in. in 8'-0" for plumb and level (including counter-tops); and with a 1/16 in. maximum offset in flush adjoining surfaces, 1/8 in. maximum offsets in revealed adjoining surfaces.
- E. Back-prime all finish wood with brush coat of alkyd paint.
- F. Where possible, secure finish wood by blind nailing, or locate and drive attachments so as to be imperceptible on finished surfaces.
- G. Where attachments must be visible, anchor mill-work to concealed blocking with finish nails or countersunk fasteners. Use fine finish nails, well-set, filled with matching putty. Conceal countersunk fasteners with solid plugs of species matching surrounding surfaces, finished flush with surrounding surfaces.
- H. Install continuous wood trim, window sills and stools, bases, railings etc. with minimum number of joints possible, using longest length pieces available, full-length pieces where possible. Shiplap or scarf joints in continuous runs.
- I. Stagger joints in adjacent and related members. Cope at returns, miter at corners. Gently ease exposed edges.
- J. Lap trim over grounds and fit tightly to adjacent materials. Scribe and closely fit face plates and filler strips to irregularities of adjacent surfaces, leaving a maximum gap of 1/32 in. Do not use additional overlay trim for this purpose.
- L. Lightly sand finished wood surfaces as required to produce uniformly smooth surface, always sanding in direction of grain. No coarsegrained sandpaper mark, hammer mark, or other imperfection will be accepted.
- M. Protect installed work as required from subsequent construction. At job completion, clean exposed-to-view surfaces.

END OF SECTION

SECTION 06610

SYNTHETIC WOOD RAILING AND DECKING

1. GENERAL

- A. REFERENCES: General provisions of Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.
- B. RELATED WORK SPECIFIED IN OTHER SECTIONS
(4.) Rough carpentry, including blocking for wall-mounted finish carpentry: Section 06100
- C. WARRANTY:
(1.) The materials shall carry the manufacturer's ten (10) year warranty.

2. MATERIALS

- A. The handicapped access ramp and South Main Entry Porch shall be fabricated from decking and post and railing system manufactured by the Trex Company, Winchester, VA. Components shall be manufactured from a combination of reclaimed wood and 95% recycled plastic. Components shall be from the Trex "Transcend" line of decking and post and railing system parts. Color: "Rope swing".
 - (1.) 4x4 Post Sleeve
 - (2.) Post Sleeve cap
 - (3.) Post sleeve skirt
 - (4.) Universal Top & Bottom rail
 - (5.) Square balusters
 - (6.) 1" grooved edge deck boards
 - (7.) ADA hand railing and accessories

3. INSTALLATION

- A. The work is to be performed according to *Trex Decking and Railing 2014 Installation Guide*.
- B. Installation of ADA hand railing shall meet the requirements of the *Massachusetts Architectural Access Board Regulations 521 CMR*.

END OF SECTION

SECTION 07160

BITUMINOUS DAMPPROOFING

PART 1.00 – GENERAL

1.01 GENERAL

A. The "Conditions of the Contract" and "Division 1, General Requirements", form part of this Section.

1.02 SCOPE OF WORK

A. Apply dampproofing at exterior surface of all new below-grade foundation walls that enclose space.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Exterior perimeter insulation system: Section 07210

1.04 SUBMITTALS

A. Submittals under this section shall include manufacturer's specifications and installation instructions on all specified products.

PART 2.00 – MATERIALS

2.01 DAMPPROOFING

A. Cold-applied liquid asphaltic or coal-tar type, containing only non-asbestos inorganic fibrous reinforcement and filler materials, for brush or spray installation, one or two coats as required for specified thickness; any of the following:

1. Solvent-based asphalt cut back type, semi-fibrated or non-fibrated, complying with FS SS-A-694 or FS SS-A-701, minimum 12 dry mil thickness.

2. Asphalt emulsion type, complying with ASTM D 1227, Type III, minimum 15 dry mil thickness.

3. Coal-tar type, complying with FS SS-C-540, minimum 12 dry mil thickness.

B. Acceptable manufacturers: Celotex, CertainTeed, Genstar, J & P, Karnak, Koppers, Lunday Thagard, Manville, Sonneborn, Tamko, Tremco (asphalt); Celotex, GAF, Koppers (coal-tar).

C. Provide manufacturer's standard or recommended accessories including non-woven glass-fiber reinforcing mat, bituminous grout, and plastic cement.

D. Protection course may be any of the following:

1. Asphalt-impregnated and coated organic fiberboard, minimum 1/8 inch thick.

2. Smooth surfaced roll roofing, 55 lbs/100 sq.ft. minimum weight.

3. 4-mil polyethylene.

PART 3.00 – INSTALLATION

3.01 STORAGE

- A. Store and install materials in accordance with Division 1 of the Contract.

3.02 INSTALLATION

- A. Allow concrete substrate to cure as long as possible before beginning installation, 7 days minimum, 28 days preferably.

- B. Maintain a minimum 40 degree F temperature during application and curing period. Install dampproofing in dry weather. Do not begin work if precipitation is forecast. Protect installed materials against for 24 hours minimum, and against direct sun at temperatures above 70 degrees F.

- C. Verify that surfaces to receive dampproofing are properly cured, dry, and free from cracks, sharp projecting edges, and foreign materials which would prevent proper adhesion. Fill voids, seal joints, and apply flashing, corner protection stripping, and bond breakers as recommended by dampproofing manufacturer, with particular attention to construction and expansion joints.

- D. Do not allow bituminous compounds to enter and clog drains and conductors. Protect adjoining work against spillage and migration.

- E. Apply dampproofing by brush or spray, in one or two coats, at rates recommended by manufacturer, to provide uniform dry film thickness specified above. Allow time for complete drying between multiple coats.

- F. Extend vertical dampproofing down wall from finished grade at least 12 inches below level of finished slab inside foundation wall. Where top of footing coincides with finished slab inside wall, extend dampproofing over top of footing and turn down minimum 6 inches over outside face of footing. Extend 12 inches onto intersecting walls and footings, but not onto surfaces which will be exposed to view when the project is complete.

- G. Fill all cracks crevices, and grooves. Make sure coating is continuous at joints, corners, etc., and free from breaks and pinholes. At changes in plane, install lapped course of glass fiber mat in first coat of dampproofing before it thickens. Tightly flash penetrations through dampproofing.

- H. Immediately after dampproofing coating has cured, install protection course, in compliance with dampproofing manufacturer's recommendations. Backfill as soon as possible after protection course is installed.

END OF SECTION

SECTION 07210

INSULATION

PART 1.00 – GENERAL

1.01 GENERAL

A. The "Conditions of the Contract" and "Division 1, General Requirements", form part of this Section.

1.02 SCOPE OF WORK

A. The scope of work without limiting the generality thereof consists of furnishing all labor, materials, and equipment necessary to perform all operations required for the complete installation of thermal insulation as follows:

1. All rigid type insulation board required at exterior walls of the Building.
2. All blanket/batt insulation indicated on Drawings.
3. Vapor Retarder.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. SECTION 06100- ROUGH CARPENTRY - Building Paper and Air Infiltration Barrier
- B. SECTION 02070- DEMOLITION - Firestopping at miscellaneous wall and floor penetrations and openings.

PART 2.00 – MATERIALS

2.01 ACCEPTABLE MANUFACTURERS

Insulation products shall be as manufactured by Certainteed, Owens Corning, Dow Corning, Manville Fiberglass Division or approved equal.

2.02 BLANKET/BATT INSULATION

- A. Mineral Fiber Type: Fibers manufactured from glass.
- B. Faced Mineral Fiber Blanket/Batt Insulation: ASTM C 665 for Type III, Class A (blankets with reflective vapor-retarder membrane facing with flame spread of 25 or less); foil-scrim-kraft vapor retarder membrane on one face.
- C. Unfaced Mineral Fiber Blanket/Batt Insulation
- D. High density high performance R-15 unfaced glass fiber thermal insulation complying with ASTM C 665, Type I and ASTM E 136.

2.03 SOUND ATTENUATION BATT INSULATION

- A. Sound control batt insulation shall be unfaced fiberglass cavity fill insulation to reduce sound transmission thru partitions and shall be non-combustible per requirements of ASTM E-136. Sound control batts shall be of thickness to attain required STC rating:
3 1/2" thick at interior walls.

2.04 FIRE RESISTIVE BLANKET INSULATION

- A. Fire blanket insulation shall be high density insulation with 2 hour fire rated under simulated field conditions using ASTM E119 guidelines.; Flame spread and smoke developed per ASTM E84 shall be 0; R-Value: 3.7 per inch, Density: 2.5 pcf (nominal).
B. Fire blankets shall be SAFB by Thermafiber, or equal by Johns Mansville or Owens Corning.

2.05 RIGID INSULATION

- A. Rigid closed-cell extruded polystyrene thermal board insulation complying with ASTM C 578-92, Type IV, density 1.6 lbs./cu. ft. min, compressive strength 25 psi (ASTM D 1621-73); Styrofoam 40 Brand Square Edge (SE) by Dow Chemical Co. or equal.
B. Thickness 2 inches unless otherwise indicated
C. Use adhesive type recommended by insulation manufacturer.

2.06 VAPOR RETARDER

- A. 4 mil polyethylene film with vapor transmission rating of 0.2 perms or less; natural color.

2.07 FOAMED IN PLACE ICYNENE INSULATION

- A. Icynene MDCR200 closed cell foam insulation

2.08 FOAMED IN PLACE INSULATION AROUND WINDOWS

- A. Urethane, isocyanurate, or phenol-based multi-component synthetic polymer. Manufactured by CP Tripolymer, NCFI, or approved equal. Approximate R-factor: 4.8 per inch.
B. Install around windows, doors, and exterior wall penetrations.

2.09 SILL-SEALER GASKET

- A. Compressible resilient insulation fabricated in strip form, width to suit sill member; 1/4 inch thick polyethylene foam (Dow Ethafoam Sill Seal).

PART 3.00 – INSTALLATION

3.01 SOUND ATTENUATION BATT INSULATION

- A. Insulation thickness shall be provided as shown on Drawings and/or specified herein and in general shall be installed at:
1. At interior walls to a height of 6" above finish ceiling or as indicated on drawings.
 2. Blanket/Batt Insulation supported by mechanical anchorage of sizes recommended by

Insulation Manufacturer.

3.02 BATT TYPE INSULATION

- A. Store the insulation in a manner so as to protect from damage due to moisture and abuse. Store on a raised platform under cover. Wet and damaged insulation shall not be used on the roof and shall be removed from the site.
- B. Install batt insulation in accordance with manufacturer's instructions.
- C. Trim insulation neatly to fit spaces. Use batts free of damage.
- D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.
- E. Install polyethylene vapor barrier over entire area of exterior walls anchored into place. Cut all necessary openings after installation of sheets. Block perimeter of required openings with studs and staple barrier to same. Replace all torn or damaged areas of the vapor barrier before application of the drywall.
- F. Extend vapor retarder tight to full perimeter of adjacent items interrupting the plane and membrane. Tape seal in place.

3.03 FOUNDATION INSULATION INSTALLATION

- A. Secure rigid insulation on perimeter foundation wall with adhesive, using spot or bead method in accordance with insulation and waterproofing manufacturer's recommendations. Place insulation horizontally.
- B. Stagger vertical joints of insulation.
- C. Install foundation insulation on interior and/or the exterior sides of perimeter foundation walls, extending to the top of footing, except as indicated or detailed on Drawings.

3.04 VAPOR RETARDER

- A. Install polyethylene vapor retarder at all exterior walls constructed of studs or furred drywall assemblies on masonry walls.
- B. Place vapor retarder between the interior face of stud or framing channel and backside of the interior finish material.
- C. Lap and seal all sheet joints.
- D. Extend vapor retarder tight to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.

END OF SECTION

SECTION 07310

ASPHALT SHINGLE ROOFING

PART 1.00 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The "Conditions of the Contract" and "Division 1, General Requirements" form part of this Section.
- B. Provide all plant, facilities, labor, materials, tools, equipment, transportation, supervision, and related work necessary to complete the work specified in this Section and as shown on the Drawings.

1.02 SCOPE OF WORK

- A. The Scope of work consists of, without limiting the generality thereof, includes all labor and materials necessary for the installation of all roof covering, flashings, and provide all related items required to complete the work indicated on the Drawings and as specified herein.
 - 1. Asphalt Shingle Roofing System.
 - 2. All related items required to complete the work indicated on the Drawings and specified herein.

1.03 SUBMITTALS

- A. Material List:
 - 1. Before any of the materials of this work are delivered to the jobsite, submit to the Architect for approval a complete list of materials proposed to be furnished and installed, and how each material is to be installed.
 - 2. Manufacturer's Recommendations: Accompanying the materials list, submit copies of the manufacturer's current specialties and recommended method of installation for the proposed roofing system, and the manufacturer's recommended installation details with appropriate notations to adapt these details to the requirements of these Contract Documents.
 - 3. Product Description – Submit:
 - a. The manufacturer's technical data for all materials to be used on this installation.
 - 4. All modifications and updating of roofing manufacturer's instructions and recommendations which are issued by the roofing manufacturer subsequent to the issuing of Contract Documents for bidding and continuing throughout the construction period shall be promptly submitted to the Architect and the Owner in writing.
 - 5. Submit Shop Drawings of metal flashings and product data, match existing.

- a. Indicate general construction, configurations, jointing methods and locations, fastening methods and locations, and installation details.
 - b. Submit manufacturer's installation instructions. Submit roofing manufacturer's sample warrantee.
6. Submit samples of ridge vent, drip edge, felt and shingles for color and texture.

1.04 QUALITY ASSURANCE

- A. The Roofer shall be required to provide documentation of acceptance of his company by the approved roofing manufacturer complying to the requirements of the Contract Documents.
- B. The Roofer shall also show proof of the following:
1. The manufacturer is familiar with the existing conditions and all substrate materials proposed for use and that the manufacturer agrees to provide all necessary technical assistance to achieve a satisfactory installation.
 2. All materials and workmanship will be in strict accordance with the manufacturer's recommendations.
 3. At completion of the work, that the manufacturer's full warranty will be issued.

1.05 GUARANTEE/WARRANTY

- A. Warranties shall begin on the date of the Owner's acceptance of the work.
- B. The asphalt shingle manufacturer shall warranty that its product is free from manufacturing defects for a period of thirty (30) years. This warrantee shall run directly to the Owner. This warranty shall also be transferable to subsequent Owners within the ten year period following shingle installation. For the first five years of warranty coverage, manufacturing defects shall be covered 100% by the manufacturer. All shingles required to repair or replace the defective product shall be provided free from the manufacturer. All labor to repair or replace the defective shingles shall be paid by the manufacturer, based on prevailing local market labor rates. For the initial five years of warrantee coverage, replacement coverage of material and labor shall not be prorated; i.e., reduced over time. These provisions of the initial five years of warranty coverage shall also be transferable to subsequent Owner for the remaining balance of coverage.

1. Should any shingles prove to be defective subsequent to the initial five year period, the manufacturer's contribution towards the cost of replacing defective shingles shall be calculated using the reasonable cost of replacing defective shingles shall be calculated using the reasonable cost to replace such defective shingles at current value, exclusive of costs of labor, roof tear-off and disposal, and then decreasing that amount of 1/300 for each month as measured from the date the shingles were installed to the date when proven defective. In the event of repair, warranty on the replaced shingles shall extend for the balance of the warranty period in effect at the time the shingles prove defective.

2. This warranty shall provide protection against defects that arise in the course of ordinary and everyday wear and tear to the of caused by normal exposure to the elements. It shall not provide protection against damage caused by situations and events beyond normal exposure conditions such as, but not limited to:

- a. Winds greater than 80 miles per hour, lightning, hurricane, tornado, hailstorm,

earthquake, fire, explosion, flood, or falling objects.

3. If shingles self-sealing asphalt strips fail to activate within the first year of application, the manufacture shall have no liability under this warranty for such defect unless afforded an opportunity to hand-seal, at its own expense, any non-sealing shingles.

4. The shingle manufacturer shall warranty its shingles to resist blow-off damage due to wind velocities, including gusts, up to 60 miles per hour, during the initial five year period following the application of shingles. If any such blow-off damage does occur within the five year period after initial application, the manufacturer shall furnish replacement shingles without charge for those shingles damaged.

- C. The Contractor shall warrant for 5 years that the asphalt shingle roofing system, as installed, is free from defects in workmanship. When repairs due to defective workmanship are required during the Contractor's warranty period, the Contractor shall make repairs within 72 hours of notification. When repairs are not performed within the specified time, emergency repairs performed by others will not void the warranty. In addition, the Contractor shall warrant for one year from completion of Project all shingles against blow-off and/or wind damage.

1.06 DELIVERY AND STORAGE

- A. Materials shall be delivered to the site in the original sealed containers or packages, and shall bear the manufacturer's name and brand designation.
- B. Materials shall be stored, handled, and installed in a manner to protect them from all damage during the entire construction period.
- C. Materials shall be stored on site only in approved locations and in strict accordance with manufacturer's recommendations. The Contractor shall be responsible to ensure against fire, vandalism or theft at all times.

PART 2.00 – MATERIALS

2.01 ROOFING SYSTEM

- A. The shingles shall be Grand Manor shingles, Class A, Type 1 (ASTM D3018) as manufactured by CertainTeed; color to match existing.
1. Mineral granule-surfaced laminated asphalt shingles, self-sealing, 18" x 36", square edge, 4 tab strip, fungus-resistant; premium shingles weighing not less than 425 pounds per 100 square feet conforming to FM Class C, ASTM E-108, Class A, and ASTM 3161, Type I. Shingles shall meet the fire resistance requirements of UL 790 for Class A and the wind resistance requirements of UL 2390. Fiberglass mat base; ceramically colored/UV resistant mineral surface granules across the entire face of shingle with granule overlay.
 2. Provide manufacturer's ridge cap shingles at ridges and hips

- B. Roofing underlayment – Underlayment shall be 60" wide 5-ply, gray in color, 100% asphalt and asbestos free, high strength performance roofing underlayment for used on steep sloped roofs beneath roofing materials. Underlayment shall be a woven HDPE with a polyethylene film laminated with black LDPE on one side and in addition a nonwoven polypropylene layer laminated with LDPE on the other side of the woven HDPE. Underlayment shall be approved as an alternate replacement for Type 15 or Type 30 asphalt roofing felt. Product: RoofTopGuard II ; manf.: Rosenlew RKW Finland Ltd.
- C. Eave, valley and rake membrane underlayment: Self-adhering rubberized asphaltic membrane (ice and water shield); a minimum of 40 mils thick, roll width 36", must have same material warranty as shingles and recommended by the shingle manufacturer. Membrane must be approved for use with shingles on slopes down to 2 inches.
1. Acceptable Manufacturers will be:
 - a. Weatherwatch Ice & Water Barrier as manufactured by GAF Building Materials Corp., Wayne, NJ.
 - b. Ice & Water Barrier as manufactured by Certainteed Corp.
 - c. Ice & Water Shield as manufactured by W.R. Grace Co., Cambridge, MA.
 - d. Or approved equal.
 2. Membrane shall be installed to extend to a line 6 feet inside the exterior wall line.
- D. Nails for Applying Shingles and Asphalt-Saturated Felt: Aluminum or hot-dipped galvanized steel with sharp points and flat heads 3/8 to 7/16 inch in diameter. Shank diameter of nails shall be a minimum of 0.105 inch and a maximum of 0.135 inch. Nails shall be long enough to penetrate completely through or extend a minimum of 3/4 inch into roof deck, whichever is less, when driven through materials to be fastened. Staples and mechanical driven nails shall not be used for installation of shingles.
- E. Modified Bitumen Flashing Cement: ASTM D 3019, Type III.
- F. Asphalt Primer: ASTM D 41.
- G. Provide thermoplastic roof flashing for all pipes projecting through the roof surface.
- H. 19 inch selvage, double coverage roll roofing; produced as a 36 inch wide sheet.

PART 3.00 – INSTALLATION

3.01 GENERAL

- A. Repair and replace any defective deck, and/or nailing of same.
- B. All roofing and flashing work shall be done by competent workmen skilled in their part of the work to be done and under the supervision of a factory-trained, licensed applicator of the roofing system

manufacturer.

- C. The roofing contractor shall inspect the substrate for defects such as excessive surface roughness, contaminated surfaces, that will adversely affect the quality of work.
- D. Installation of any roofing materials shall be interpreted as acceptance of the previous substrate by this Contractor.
- E. Roofing system to be installed as per manufacturer's requirements.
- F. The Roofing Contractor shall furnish and install his own scaffold or rigging.
- G. 19 inch selvage, double-coverage roll roofing, 36 inch-wide sheet, of which 17 inches are intended for the exposure and 19 inches are intended for the selvage edge. Contractors should strictly follow the manufacturer's directions.

3.02 JOB CONDITIONS

- A. Coordinate with the General Contractor regarding removals of existing construction and roofing and flashing as necessary to provide new roofing and flashing work. Remove and repair or replace existing roofing insulations and flashing to the extent necessary to adjoin new to the existing roofing surface.
- B. Prior to and during application, all dirt, debris and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air and/or similar methods.
- C. All surfaces to receive new mineral granule-surfaced asphalt shingles or flashings shall be thoroughly dry. Should excessive surface moisture occur, the contractor shall provide the necessary equipment to dry the surface prior to application.
- D. All new and temporary construction, including equipment and accessories, shall be secured against wind blow-off or damage.
- E. The Contractor shall comply with all OSHA Safety Regulations.

3.03 APPLICATION

Apply roofing materials as specified herein unless specified or recommended otherwise by shingle manufacturer's written instructions.

A. Underlayment

1. Provide one layer of underlayment to roof deck. Provide a 19 inch wide strip as starter sheet to maintain specified number of layers throughout roof. Lay parallel to eaves, starting at eave. Provide minimum 19 inch head laps, 6 inch laps from both sides over ridges, and 12-inch end laps in the field of the roof. Nail sufficiently to hold until shingles are applied. Turn up vertical surfaces a minimum of 4 inches. When a self-adhering membrane is used for eave flashing, start underlayment from upper edge of eave flashing. Follow manufacturer's instructions.

B. Membrane Underlayment

1. From the eaves to a point 24 inches minimum beyond the exterior wall, apply one layer of self-adhering membrane as shown on the Drawings. Apply at all ridges, hips and rakes. Follow membrane manufacturer's printed installation instructions.

C. Starter Strip

1. Apply starter strip at eaves, using 9 inch wide strip of mineral-surfaced roll roofing of a color to match shingles. Optionally, use of a row of shingles with tabs removed and trimmed to ensure that joints are not exposed at shingle cutouts. Apply starter strip along eaves, overlaying and finishing even with lower edge of eave flashing strip; fasten in a line parallel to and 3 to 4 inches above eave edge. Place nails so top of nail is not exposed in cutouts of first course of shingles. When roll roofing is provided, seal tabs of first course of shingles with modified bitumen flashing cement. Fasten with 6 nails per strip of shingles or space nails at 6 inches o.c. for roll roofing. Seal tabs of first course of shingles with asphalt roof cement as specified below.

D. Shingle Courses

1. Starting first course with full shingle, and apply succeeding courses with joints staggered at thirds or halves. Butt-end joints of shingles shall not align vertically more often than every fourth course. Apply shingle courses as follows:

a. Fastening: Do not drive fasteners into or above the factory-applied adhesive unless adhesive is located 5/8 inch or closer to top of cutouts. Place fasteners so that they are concealed by shingle top lap and penetrate the head lap.

b. Nailing: Apply shingles with nominal 5 inch exposure. Apply each shingle with minimum of six nails. Place one nail one inch from each end and one nail on each side of each cutout, on a horizontal line 5/8 inch above cutouts.

3.04 COMPLETION

- A. Prior to demobilization from site, the work shall be reviewed by the Owner, Architect and Contractor. All defects noted, non-compliances with these specifications or the recommendations of the mineral fiber slate roofing manufacturer.
- B. All guarantees, as required in Part 1.00 of this Specification, shall be submitted for approval prior to final payment.

3.05 CLEAN-UP

- A. Site clean-up including both interior and exterior building areas below or adjacent to, or in any way affected by the construction shall be begun immediately upon Owners request and be complete to the Owner's satisfaction.
- B. All paved areas shall be swept clean.
- C. All areas stained, dirtied, and discolored or otherwise damaged due to the work shall be cleaned,

restored and replaced as required.

- D. All shingles, felt, eave flashing, trash and debris shall be completely removed and legally disposed of off site periodically during the work and at completion of the work.

3.06 EXTRA MATERIALS

- A. Furnish one (1) extra square of shingles for future replacement purposes.

- 1. Obtain signed receipt from Owner.

END OF SECTION

SECTION 07610

SHEET METAL ROOFING

PART 1 - GENERAL

1.01 REFERENCES: General provisions of Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 SCOPE OF WORK

- A. Provide a custom sheet metal roofing system capable of withstanding structural movement, thermally induced movement, and a complete watertight enclosure fabricated from metal sheets to the configuration and details described herein and depicted on the architectural drawings accompanying these specifications. The system includes all custom formed sheet metal roofing panels, solder, felt and rosin paper.

1.03 SUBMITTALS

- (1.) Product Data: Include manufacturer's product data, general specifications, standard details, wind uplift test results.
- (2.) Shop drawings: Show plan of panel layout and how, if needed, expansion and contraction of material is provided using stationary cleats or expansion cleats.
- (3.) Show direction of roof expansion and contraction.
- (4.) All penetrations through panels.
- (5.) Details at eave, ridge, hip, valley, rake, cricket, flashings, and penetrations and any special details.
- (6.) Show all cross seams locations and type depending on roof pitch.
- (7.) Sufficient technical data to demonstrate compliance with these specific requirements.
- (8.) Fastener, cleat and attachment layout, with load carrying capacity to meet these specifications and how the cleat and fastener will hold into the substrate.
- (9.) A description of installation procedures which, when approved by the architect, will become the basis for accepting or rejecting the work.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications
Installer must be proven, experienced applicator who has completed several custom projects using SMACNA or CDA Specifications and details along with owner, architect and general contractor contacts. Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work.
- B. Referencing Specifications and Standards
1. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
 2. American Society for Testing and Materials (ASTM).
 3. Copper and Common Sense (Revere Copper Corp.)

1.05 Warranty

- A. Provide manufacturer's standard warranties covering products to be free from perforation resulting from corrosion.
- B. Guarantee - Roofing contractor to provide standard two year material and workmanship for a watertight installation. This warranty does not cover damages caused by acts of God,

ordinary wear and tear or unusual abuse or neglect or acts and omissions of parties other than the sheet metal roofing manufacturer or installer.

1.06 PERFORMANCE AND TESTING

A. Provisions For Thermal Movement

Metal roofing systems shall be fabricated and installed so that they provide for expansion and contraction of the component materials without buckling, hole elongation, fastener failure or excess stress loading situations developing at any time during the temperature cycle. Cleats shall be installed to resist rotation (2 fasteners per cleat) and to avoid stress when roofing expands and contracts. Any continuous panel run exceeding 30 feet must involve expansion cleats. Follow SMACNA for all recommendations to design details.

B. Uplift Resistance

Metal roofing systems shall be fabricated to resist the negative pressure and uplift loads as shown in the SMACNA Manual – 5th edition, appendix A-4.

If necessary a separate independent test can be performed to determine the actual pullout of the particular fastener in the particular substrate. Most fastener manufacturers have tested their parts in different substrates. It is recommended that a safety factor be used with all fastener applications.

PART 2 - PRODUCT

2.01 PRODUCT

- A.** All sheet copper roofing shall be standard, 20 ounce-weight copper conforming to ASTM specification B370 coated both sides with zinc/tin alloy approximately 0.5 mils thick. Composition of the alloy shall be approximately 50-percent zinc and 50-percent tin with trace elements controlled for durability, corrosion resistance and color.
- B.** The alloy shall be applied by the hot-dip process. All alloy coated copper shall have temporary, degradable pre-weathered coating to minimize water-stains during transit and storage and provide initial weathered appearance.
- C.** Flat Seam Roof Panels
Flat seam system shall be designed for concealed mechanical attachment of roofing panels to substrate.
- D.** Cleats
Use manufacturer's preformed cleats or fabricate from flat stock sheet product to SMACNA Specifications.
- E.** Slip Sheet
Use rosin sized paper as final underlayment under metal panels.
- F.** Felt Underlayment
Minimum one layer 15 lb./100 sq. ft. asphalt saturated felt paper.
- G.** Fasteners
Minimum 7/8" Series 300 stainless steel ring shank nail or equal screw type fastener.
- H.** Solder
Solder shall conform to ASTM specification B32 and shall be pure tin OR lead-free, high-tin. Use soldering irons only. Do not use abrasives in preparing the surface for solder.

2.02 FABRICATION

- A.** Shop Fabricate to the Maximum Extent Possible
(1.) Custom fabricate all flashings by obtaining field dimensions for accurate fit.

- (2.) Layout so cross seams, when required, will be made in the direction of flow with higher panels overlapping the lower panels. Keep field cutting to a minimum.
- (3.) Cross Seams: Provide staggered transverse seams.
- (4.) Provide expansion cleats on panels 30 feet or more in length.
- (5.) Provide expansion joints as required.
- (6.) Penetrations through the roof are to be fabricated and installed to allow for expansion and contraction of the roof sheet without buckling.

PART 3 - INSTALLATION

3.10 STORAGE AND HANDLING

- A. Materials stored must be kept dry. Store coated copper sheets, coils and formed shapes off the ground, in an enclosed structure. Do NOT store in a manner or location so that the water or moisture may remain between sheets or shapes prior to installation. Do NOT store on bare ground under a tarp or in other manner that may cause condensation to form on or between sheets or shapes.
- B. Handle sheets and shapes in a manner to reduce scratches, dents, etc.
- C. Materials stored on site must be vented to allow condensation to escape.

3.11 INSTALLATION

A. Surface Conditions

- (1.) Pre-roofing conference after substrate is installed; with all related trades, architect, general contractor and owners representative. Conference should agree that surface is ready for installation of finished custom metal roofing.
- (2.) Examine the areas and conditions under which work of this Section will be performed. Do not proceed until unsatisfactory conditions are corrected.
- (3.) Verify that the substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provisions have been made for roof drains, scuppers, flashings, and all other interface items attaching to or penetrating through the work of this Section.

B. General

- (1.) The installed work of this Section will not be used as a storage space for other materials.
- (2.) Do not permit unnecessary walking on the finished roof. Require all personnel to wear rubber-soled shoes when installing or walking on a finished roof.
- (3.) Finished roofing shall be protected during installation and cleaning of masonry with tarps, polyethylene sheeting, or similar impervious materials. To prevent water stains due to condensation trapped on metal's surface, protection must be removed at the end of each workday.

C. Installation of Roofing

- (1.) Install roofing felts lapping a minimum of 4" (102 mm). Apply the specified slip sheet. Prevent moisture from damaging substrate prior to installation of final metal skin.
- (2.) All horizontal seams shall be soldered.
- (3.) Install roofing sheets and flashings in strict accordance with original design, pertinent regulations of governmental agencies having jurisdiction, and the recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under the anticipated weather conditions. Initially layout and

locate all lines and panel terminations. For batten seam roofs, layout all battens accurately onto the substrate prior to installation of the sheets.

- (4.) Install clips to hold sheet into position. Use two fasteners per clip to prevent rotation.
- (5.) Installation performed by qualified trained personnel experienced in the installation of metal roofing and employed by the metal roofing contractor.
- (6.) Installation to have seams and lines as established by the approved shop erection drawings.
- (7.) Metal roofing to be installed per approved drawings with fixed points determined by direction of expansion.
- (8.) Nail cleats a maximum of 12" (305 mm) on center; turn tabs over nail or use appropriate stainless steel fasteners. For battens, preinstalled clips, anchor battens to substrate using compatible fasteners spaced as required to hold design uplift but at no times greater than 18" (460 mm) apart. Clips should be centered no more than 12" (305 mm) on center on the battens.
- (9.) Complete seaming of standing seam panel by automatic seaming machine or other accepted and approved method designed to obtain the proper seam dimension and height.
- (10.) Minimize all exposed fasteners, utilize cleated seams whenever possible.
- (11.) Protect against dissimilar metal contact.
- (12.) Details should be per SMACNA ARCHITECTURAL SHEET METAL MANUAL recommended details.

3.12 ACCEPTANCE AND CLEANUP

- A. Remove and properly dispose of all foreign material and debris from roof and gutters. Be sure no dissimilar metal or other materials are left on roof surface.
- B. Clean and neutralize all flux materials.
- C. Clean off all excess solder and sealants.
- D. Wipe off all hand prints, smudges and other superficial stains that were placed on the custom metal roofing and flashings during fabrication and installation.
- E. Remove and replace all dented and damaged materials.

END OF SECTION

SECTION 07620

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 REFERENCES: General provisions of Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Plywood roof sheathing: Section 06100.
- B. Asphalt shingle roofing: Section 07530
- C. Sheet metal roofing: Section 07610

1.03 SUBMITTALS: Issue submittals in accordance with Section ID, Submittals, Shop Drawings, Product Data and Samples.

- A. Submit shop drawings of metal flashings showing anchorage, joints, fastener types, profiles, etc.; and 8 in. sq. samples of exposed-to-view sheet metals.
- B. Samples of gutter/downspout materials proposed for use in the work shall be submitted including:
 - 1. Conductors (gutters) –one-foot sections.
 - 2. Leader (downspout) Straps –
 - 3. Expansion Joint –.
 - 4. Gutter Apron and Hangers –.
 - 5. Downspout Elbows.

1.04 QUALITY ASSURANCE

- A. Refer to General and Supplementary Conditions for general provisions covering material storage, installation, and substitutions.
- B. Materials and installation shall comply with recommendations of SMACNA Architectural Sheet Metal Manual.

15. GUARANTEE-WARRANTY

- A. This Contractor shall furnish a written warranty, countersigned and guaranteed by the General Contractor, stating that all work executed under this section will be free from defects of material and workmanship for a period of two (2) years from the date of Substantial Completion.
- B. The following types of failures will be adjudged as defective new drainage: undue expansion, lifting, deformation, loosening, splitting of seams, leaking, failure to stay in place.

16. DELIVERY AND STORAGE AND HANDLING

- A. Deliver materials in sealed packages.
- B. Store and handle material to prevent intrusion of foreign materials and damage by weather or breakage. Packaged materials shall be delivered and stored in original packages with

manufacturers labels intact and legible.

1. Packages opened for inspection shall be resealed until ready for use. Packages, materials and equipment showing evidence of damage shall be rejected.

C. All materials affected by dampness shall be stored in suitable substantial watertight storage facilities maintained in good condition throughout their use. All storage facilities shall be protected from acts of vandalism.

PART 2 - PRODUCTS

2.01 MATERIALS

A Sheet metal:

Tin/zinc coated Copper, per ASTM 370, cold-rolled except where temper 060 is required for forming.

Lead coated copper at masonry

Thickness: 16 oz./ sq.ft. typical, if not shown otherwise on drawings; 24 oz./sq.ft. for continuous cleats or hook strips.

B Miscellaneous materials and accessories:

1. Solder: per ASTM B 32, 50/50 tin-lead type; soldering flux as suited for specific metal.

2. Fasteners: screws, or threaded or annular ring-type nails, penetrating 1 in. minimum into wood; of same or other galvanically compatible metal as metal being fastened. Fastener heads shall match metal being fastened.

3. Bituminous coating: SSPC Paint 12, solvent-type bituminous mastic, nominally free of sulphur, compounded for 15 dry mil thickness coat.

4. Mastic sealant: polyisobutylene.

5. Provide sheet metal clips, straps, anchoring devices, and similar accessories as required, matching material being installed, of size and gauge required for performance.

6. Adhesive: as recommended by sheet flashing fabricator.

7. Roofing cement: ASTM D 2822, asphaltic.

2.02 SHEET METAL FABRICATION

A Shop-fabricate work to greatest extent possible. Furnish metal flashing in 8-to-10 ft. lengths for continuous runs. Shorter pieces may be used at ends of runs and at corners. Corners shall be mitered, seamed and soldered.

B Fabricate non-moving joints with flat-lock seams. Joints shall follow recommendations of SMACNA Manual.

C Hem exposed edges. Angle bottom edges of exposed vertical surfaces to form drips. Fabricate flanges so as to extend 4 in. minimum over roof blocking.

D Gutters: sizes and shapes per architectural drawings. Provide gutter ends, hangers, spacers, expansion joints, strainers, and outlet tubes as recommended in SMACNA Manual. Provide continuous mesh gutter guards, with selvaged edges and non-corrosive fasteners, galvanically compatible with gutters.

E Downspouts: corrugated, plain, round, dimensions as shown.

1. Telescope upper sections into lower sections 1-1/2 in. minimum. Seal joints.
2. Attach to wall with brackets matching existing. Locate brackets at downspout top, bottom, horizontal joints, and 10 ft. o.c. maximum.
3. Fit downspout strainers tightly into each outlet. Elbow downspouts away from wall at open ends, and provide a masonry splash block, 4 in. back height, 4 in. wider than downspout at back, sides tapered from 4 in. to 1 in., front width 18 in., length 30 in. Terminate downspout elbow 1 in. above back of splash block.

F Drip edge: brake-formed to provide 3 in. roof deck flange, and 1-1/2 in. fascia flange with 3/8 in. drip at lower edge.

SHOP FABRICATED SHEET METAL ITEMS

A. Metal dip edges: 6 inch

B. Counterflashing where roofing system meets masonry: one-piece unit installed in slot recess, fabricated to provide spring action against top of base flashing. Metal flashing shall overlap base flashing 4 in. minimum.

C. Gutters: 16 oz. Tin/zinc coated Copper, sizes and shapes per architectural drawings. Provide ends, expansion joints, strainers, and outlet tubes as recommended in SMACNA Manual. Provide mesh conductor-head guards at each outlet tube with selvaged edges and non-corrosive fasteners, galvanically compatible with gutters.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installed work shall be watertight, without waves, buckles, or distortion, properly installed to allow for expansion and contraction.

B. Embed horizontal flanges of sheet metal work in a thick bed of sealant or adhesive, and secure with two staggered rows of nails, 4 in. o.c. each row, with outer row not less than 1/2 in. from flange edge.

C. Sheet metal flashing in conjunction with asphalt roofing shingles shall be properly pitched, interlocked, and extended under shingles a minimum of 4 in. Extend flashing vertically up underneath wall siding, as detailed.

D. Separate dissimilar metals to prevent galvanic action, using sealant, paint, or sheet material. Where metal is to be installed directly on wood substrate, install slip sheet of red rosin paper or sheet polyethylene. Install sealant where flashing terminates against dissimilar materials.

D. Examine all existing flashings at all intersections of roofs and vertical surfaces of all kinds, at all openings in roofs where pipes or other items extend through roof surfaces, and all other points where called for or required by conditions to provide water and weatherproof construction and repair and/or replace all damaged flashings as directed by Architect.

1. All laying and workmanship of all copper work herein specified shall be in accordance with the specifications of the Copper & Brass research Assoc., 420 Lexington Ave., New York, insofar as they apply to the work. These specifications shall be considered as part of this specifications to the same extent as if they were written herein in full.

2. Proper provisions shall be made in installation to allow for the expansion and contraction of sheet metal under normal temperature ranges within causing damage to the metal, its joints or fastenings.

4. Cleats, and edge strips shall be used wherever possible for securing sheet metal in place. Nailing through sheet metal shall not be done except where absolutely necessary and approved. Any such nails or screws through the sheets shall have over-size holes and lead washers to allow for expansion, and exposed heads where required to insure watertightness shall have metal cover caps soldered on.

5. Fastenings: All nails, screws, bolts, clips or other device used for the fastening of sheet metal together or in place shall be of similar metal and equal in corrosion resisting quality to the sheet metal on which they are used.

6. Insulation AGAINST ELECTROLYTIC CORROSION: No plain copper shall be installed in direct contact with other metal except tin or lead. When such contact is unavoidable, either lead coated copper shall be used, a full width separator of sheet lead to be installed, or both surfaces be painted with asphaltum and separated by a ply of asphalt saturated felt.

E At job completion, clean adhesives, stains, dirt, and other imperfections from exposed-to-view flashing using cleaning materials compatible with base metal.

END OF SECTION

SECTION 07900

SEALANTS

1.01 REFERENCES: General provisions of Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 WORK INCLUDED IN THIS SECTION

A. Scope of work in this Section includes all exterior and interior sealants and caulking, except as excluded under Related Work Paragraph 1.03 below.

B. Attention is directed to sealant and caulking requirements at various finish materials, as shown on drawings and specified in other specification Sections, all of which are included as part of work in this Section.

C. In addition to joints specifically shown on drawings, scope includes joint sealers for following locations:

1. Exterior joints:

- Perimeter of frames and sills of windows
- Openings where items pass through exterior walls. Use sealing compound at both exterior and interior surfaces of exterior wall penetration.
- Joints between wood and stone, concrete or masonry
- Gaps less than 1/4 in. in wood trim as directed by the architect.
- Metal to metal joints where sealing or caulking is shown or specified.

2. Interior joints:

- Openings 1/4 inch and less between walls and partitions and adjacent casework, door frames, built-in or surface-mounted equipment and fixtures, etc.
- Perimeter of window frames adjoining walls and partitions.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Cutting, patching and repairs to existing construction, including sealant work: Section 01040 and 01600.

B. Sealant in conjunction with sheet metal flashing and trim: Section 07610.

C. Sealing in conjunction with windows: Section 08520.

1.04 SUBMITTALS: Issue submittals in accordance with Section 01300, Submittals and Record Documents. Submittals under this Section shall include:

A. Manufacturers' specifications and installation instructions on all specified products.

B. Color charts and material samples.

1.05 QUALITY ASSURANCE

- A. Refer to Section 01600, Products and Installation, for general provisions covering material storage, installation and substitutions.
- B. Make trial applications at field mock-up panels or portions of actual installation areas for each type of sealant specified.

2.01 MATERIALS

- A. Sealants shall be chemically-curing elastomeric type, of base polymer specified below, complying with ASTM C 920 requirements, including those for Type, Grade, Class and Use. Provide Use Type M (mortar), G (glass), A (aluminum), or 0 (materials other than foregoing), as applicable for field condition.
- B. Sealant for joints in exterior vertical surfaces: one or two-part non-sag polyurethane, complying with ASTM C 920; Type M or S, Grade NS, Class 25 or higher, Use NT. Acceptable products include:
--Bostik Chem-Calk 500, 900 or 2639
--Mameco Vulkem 116, 227, 921 or 922
--W. R. Meadows Dualthane
--Pecora Dynatrol I or II
--Products Research & Chemical Corp. Permapol RC-I or RC-2
--Sika Corp. Sikaflex-1a, -iSM or -2c NS
--Sonneborn NP-1 or NP-2
--Tremco Dymonic or Dymeric
- C. Sealant at joints in horizontal surfaces: one or two-part pourable self-levelling polyurethane, complying with ASTM C 920, Type M or S, Grade P, Class 25, Use T. Acceptable products include:
--Bostik Chem-Calk 550 or 950
--Mameco Vulkem 45, 245 or 255
--W.R. Meadows Pourthane
--Pecora NR-200 and NR-201 Urexpan
--Products Research and Chemical PRC 280
--Sikaflex-2c SL
--Sonneborn Sonolastic SL-I or Paving Joint Sealant
--Tremco THC-900.
- D. Sealant colors shall be selected by Architect from manufacturer's standard range. If not specifically selected, color shall match adjacent materials as closely as possible.
- E. Provide non-staining sealant backing materials and accessories as recommended by sealant manufacturer, including joint cleaner, primer-sealer, bond-breaker tape and masking tape. Where no other joint back-up exists, provide a compressible closed-cell polyethylene foam backer rod, 25 to 50 percent greater in diameter than joint width.

3.01 JOB CONDITIONS

- A. Material storage and installation procedures shall conform to general provisions of Section 01600, Products and Installation. Install sealants in accordance with applicable ASTM specifications including ASTM C 804 (solvent-release curing sealants) and ASTM C 790 (latex sealants).
- B. If possible, install sealants within a 40-to-85 degree F temperature range. Do not install sealants at temperatures below 40 degrees F unless specifically permitted by manufacturers. At temperatures below 40 degrees F, take particular precautions to provide clean, dry, frost-free surfaces.

3.02 PREPARATION

- A. Thoroughly clean joints of foreign materials which would prevent good sealant bond, such as dirt, loose mortar, oil, wax, coatings and sealing compounds. Blow debris out of joints with oil-free compressed air where necessary. Mask adjacent surfaces with tape.
- B. Clean metals before applying sealant with solvent-based xylol, toluol or MEK, carefully wiped off with dry clean cloths. Do not use solvents that leave an oil deposit, such as mineral spirits or kerosene.

3.03 INSTALLATION

- A. Push compressible back-up material specified under PRODUCTS into position, using a smooth blunt-pointed tool, placed straight and accurately to depth. Do not stretch or puncture compressible backup during installation. Back-up material shall be continuous, with no voids.
- B. Sealant depth shall be equal to joint width in joints 1/4-to-1/2 in. wide, with maximum depth not to exceed 5/8 in. when joint width exceeds 1/2 in. No joint shall be smaller than 1/4" x 1/4".
- C. Where recommended by sealant manufacturer, apply a primer or surface conditioner to obtain satisfactory adhesion to substrate at sides of joints. Primer shall be as manufactured or specifically recommended by sealant manufacturer.
- D. Where sealant must be installed directly against metal, concrete, masonry or mortar (without compressible backer), prime backer surface with a suitable bond-breaker such as polyethylene tape so that sealant does not bond to back-up.
- E. Thoroughly mix two-part sealants. Use sealant within time limits specified by manufacturer. Discard materials not used within prescribed time.
- F. Apply sealants using hand or power gun with nozzle of proper size and sufficient pressure to completely fill joints. Push, do not pull, gun along joint. Sealant shall completely fill joint void.
- G. Tool sealants to slightly concave surface. Remove masking tape immediately after tooling. Immediately clean excess sealant from adjacent surfaces. Protect horizontal joints with masked construction paper and allow to cure 72 hours minimum.
- H. At job completion, provide a minimum of one new cartridge of each type and color of sealant used, for maintenance purposes.

++ END OF SECTION 07900 ++

JOSEPH SIMES HOUSE
PHASE 2
SEALANTS / 07900-254

SECTION 08200

WOOD DOORS AND FRAMES

PART 1.00 – GENERAL

1.01 PROVISIONS INCLUDED

- A. The "Conditions of the Contract" and "Division 1, General Requirements", form part of this Section.

1.02 SCOPE OF WORK

- A. Work included under this Section, without limiting the generality thereof, consists of furnishing and installing all wood doors as shown on the Drawings, Schedules and as specified herein.
 - 1. Solid wood stile and rail doors
- B. Related Work Specified Elsewhere:
 - 1. Finish Carpentry: Section 06200
 - 2. Hardware: Section 08700
 - 3. Finishing of Doors: Section 09900

1.03 SUBMITTALS

- A. Shop drawings and manufacturer's literature and product data shall be required on all work included showing sizes, full details of materials, anchorage, reinforcement and face veneer.
 - 1. Submit for approval product data of all products to be used for pre-finishing of doors.

PART 2.00 – MATERIALS

2.01 GENERAL

- A. Wood species shall be mahogany at exterior doors and poplar at painted interior doors.

2.02 CUSTOM WOOD STILE-AND-RAIL DOORS

- A. Fabricate in compliance with Awl Quality Standards, Section 1400, Grade and wood material as specified above under Paragraph 2.01, GENERAL. Door sections and profiles, door sizes: as shown on drawings. Glazing, accessories, hardware: specified in Division 8 Sections.
- B. Match elevation per drawings.

2.03 WOOD STILE-AND-RAIL FIRE RATED DOORS

- A. Fabricate doors to meet UL fire rating per Door Schedule.
- B. Doors shall be manufactured by Harring, Trustile, or Simpson
- C. Provide matching fire-rated frame.
- D. Match elevation per drawings.

2.04 WOOD FLUSH DOORS

- A. Interior wood flush doors shall be, 1-3/4" thick solid core. All doors shall have face veneers of rotary cut Birch, 3 ply construction, "Good Grade" for paint finish and shall conform to the Interior Industry Standard of ANSI/National Woodwork Manufacturers Association I.S. 180 and bear the NWMA Hardwood Door "Quality Certified" Seal of Approval.
 - 2. Vertical edge banding shall be pine, of adequate thickness to accept fully mortised hinges before job trimming. Rails shall be min. 1" thick. Coordinate to specified hardware under Section 08700.
 - 3. Adhesive for crossbanding and face plies of all wood doors shall be Type I Exterior Waterproof adhesive, applied to the core and bonded by the hot press method.
 - 4. Doors shall be as manufactured by Stanley Works of New Britain, Connecticut, Cal-Wood Door of Santa Rosa, California; Eggers Industries, Neenah, Wisconsin; Fenestra Corp., Oshkosh Wood Door Div., Oshkosh, Wisconsin, Premdor, or approved equal.
- B. All flush doors shall be pre-fit, pre-machined with hardware installed.

2.05 GLASS AND GLAZING MATERIALS

- A. See Section 08800 Glass and Glazing

PART 3.00 – INSTALLATION

3.01 STORAGE AND PROTECTION

- A. Protect doors against dampness during and after delivery. Store under cover in a well ventilated building and where not exposed to extremes or changes of temperature or humidity. Keep in cartons where possible.
- B. Materials shall not be delivered unduly long before they are required for the proper conduct of the work.
- C. All doors shall be guaranteed against defects and warpage for a period of one (1) year after the doors have been installed and acceptance of the project by Owner.

3.02 WORKMANSHIP

- A. Install doors in accordance with manufacturer's recommendations and as per details. Hang doors with 1/16" clearance at sides and tops and 5/8" clearance at bottom.

END OF SECTION

SECTION 08520

SECONDARY WINDOWS

PART 1 – GENERAL

- A. SCOPE. Provide all Secondary windows of the types and sizes shown in the plans and/or as called for in this specification shall be furnished with all necessary hardware, fasteners and miscellaneous equipment as herein specified.
- B. Quality standards shall be as described within these specifications.
- C. SUBMITTALS - Provide manufacturer's catalog cuts. Provide shop drawing showing panel layout and hardware installation. Provide sample installation for approval by Owner.
- D. WARRANTY- Manufacturer shall provide a five (5) year warranty against faulty materials, paint and workmanship.

PART 2 – MATERIALS

- A. PRODUCT- Product shall be Magnetic One Lite - Operating "MOL-OP" as manufactured by Allied Window, Inc. Application shall be interior installation; lift out frame; divided lites; bottom operable; operating interior screen
- B. ALLOYS. Aluminum shall be of commercial quality and of proper alloy for window construction free from defects impairing strength and durability. All straight extruded sections shall be of 6063-T5 alloy and temper and shall have a minimum ultimate tensile strength of 22,000 P.S.I. and a yield of 16,000 P.S.I.
- C. WINDOW MEMBERS. All sash members shall be of extruded aluminum with a 3/8" x 1" dimension. All extrusions shall be of sufficient strength to perform as designed. Window members shall have a nominal wall thickness of not less than .062". All corner keys shall be of extruded aluminum. High-energy foam-backed magnetic tape shall be applied to jamb rails of removable panel/assembly.
- D. FASTENERS. All screws and other miscellaneous fastening devices incorporated shall be zinc plated, cadmium plated or other non-corrosive metals compatible with aluminum.
- E. HARDWARE/MAGNETIC SEAL. Head receptor to be extruded aluminum U-channel with dimensions of 1/2" x 5/8" and with nominal wall thickness of not less than .046". The magnetic seal is accomplished by the use of one (1) of these jamb stop alternatives:
 - Foam-backed steel tape applied to U-channel noted above
 - Foam-backed steel tape applied to aluminum angle
 - Steel angle or channel
- F. WEATHERSTRIPPING. Bottom rail of panel/assembly shall incorporate flexible "sill-seal" weatherstripping. Operating track jamb members shall be lined with pile weatherstripping equal to Stan-pro #525-160.

- G. **ASSEMBLY.** All windows shall be assembled in a secure and workmanlike manner. The master frame and insert frame(s) shall be of mitered head and sill. Frame rails and stiles shall be neatly joined together using extruded aluminum corner keys staked in place.
- H. **SASH.** The operable bottom sash shall be removable and be equipped with a full bottom rail lift handle. Heavy-duty spring-loaded latches shall be provided for variable sash positions for ventilation.
- I. **FINISH-** The exposed surfaces of all aluminum members shall be clean and free from serious surface blemishes. Standard finishes shall be mill finish or electrostatically applied baked acrylic enamel in bronze.
- J. **SCREENS-** Extruded screen insert frame(s) (3/8" x 1 1/16") with extruded aluminum corner keys shall be provided. Standard screen cloth is charcoal aluminum 18 x 16 mesh securely held in frame with vinyl spline .
- K. **GLASS AND GLAZING-**
 - (1.) **GLASS.** Glass shall be not less than "B" quality. Standard factory glazing shall be "DSB" (1/8"). Use of 5/32", 3/16", or tempered glass shall be dictated by size of panels, code requirements, or project specifications.
 - (2.) **GLAZING MATERIAL.** Glass shall be held in place with removable and reusable vinyl glazing splines. Vinyl shall be manufactured from virgin polyvinyl chloride. All corners shall be neatly mitered.

PART 3 – INSTALLATION

- A. The installer shall securely fasten windows in place to a straight, plumb and level condition, without distortion of the windows and shall make final adjustments for proper operation in accordance with the manufacturer's instructions.

END OF SECTION

SECTION 08700

FINISH HARDWARE

PART 1.00 - GENERAL

1.01 REFERENCES: General provisions of Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 DESCRIPTION OF WORK

A. Work specified in this Section:

1. Provide labor materials and equipment necessary to complete work of this Section, including but not limited to following: lever handle mortise locks and latches, hinges, closers, stops, threshold, push-pull hardware, life-safety hardware.
2. Entry locksets and interior door hardware to match existing

B. Related work specified in other Sections:

1. Wood Doors – Section 08200

1.03 SUBMITTALS

A. Issue submittals in accordance with Section 01300, Submittals and Record Documents. Submittals under this Section shall include:

1. Catalog cuts on major items and complete hardware schedule including manufacturers' names, catalog numbers, finishes, etc. Comply with Door and Hardware Institute recommendations for hardware schedule format.
2. Samples of each major type of exposed hardware, finished as specified. After approval, samples will be returned to Contractor and (if undamaged) may be used in work.

1.04 QUALITY ASSURANCE

A. Refer to Section 01600, Material and Equipment, for general provisions covering material delivery, storage and installation, and produce substitutions.

B. Hardware shall comply with applicable requirements of Massachusetts Architectural Access Board Rules and Regulations, 521 CMR; NFPA 101; NFPA 80 at fire-rated openings; and ANSI/BHMA 156 Series, Grade as specified under PRODUCTS.

C. Submit name of proposed hardware supplier and brands of hardware for approval before preparation of schedule.

D. Supplier shall have an established place of business offering builder's hardware, with a

supply of replacement parts for proposed brands of hardware. He shall have in his employ a member of American Society of Architectural Hardware Consultants, who shall prepare complete hardware and keying schedule in consultation with Architect.

PART 2.00 – MATERIALS

2.01 GENERAL

A. Acceptable manufacturers (where not itemized in later paragraphs):

1. General hardware: Corbin, Russwin, Sargent, Schlage, Yale, Best.
2. Pulls, protective plates, wall and floor stops, miscellaneous: Baldwin, Builders Brass Works, Burns, Brookline, Cipco, Glynn-Johnson, Hiawatha, Ives, Quality, Rockwood, Stanley.
3. Thresholds: National Guard Product, Pemko, Reese, Zero.

B. ANSI/BHMA 156 Series Classification: Grade 1.

C. Hardware provided under this Section for steel door and frame security assembly openings shall be of suitable materials and strength.

D. Furnish all screws, bolts and fasteners required to properly install hardware. Where possible, fasteners shall be concealed from view. Material and finish of visible fasteners shall match hardware.

E. Base metal, unless otherwise noted: stainless steel, steel, bronze or brass.

F. Finish: Satin brass US 4 (BHMA 606).

2.02 HARDWARE ITEMS: All hardware items finish to match existing door hardware unless designated otherwise on door schedule (see Hardware Schedule on Drawings). Finish shall match between items on a given door.

A. Hinges: Hinges: (Exterior door(3 per leaf)) Ives 5BB1HW 5 X 4.5 NRP

1. Hinges shall comply with BHMA/ANSI A156.1 Grade as specified above under Paragraph 2.01, GENERAL. Acceptable manufacturers: Hager, McKinney, Stanley.
2. Supply ball-bearing butt-type hinges for all scheduled doors, with flush bearings and tips, pins which are either non-removable or removable only when door is open; Stanley five-knuckle FBB 179 Line or equal at interior. FBB 199 Line at exterior unless otherwise noted.
3. Provide a minimum of three hinges per door. Hinges shall be fully-mortised.
4. Typical size: 4-1/2 x 4-1/2, standard-weight.

5. Hinges at interior doors: Steel, finish as specified above under paragraph 2.01.

B. Lock/Latchsets: Entry lockset: dummy pull to be selected

1. Lock/Latchsets shall comply with BHMA/ANSI A156.2, Grade and Finish as specified above under Paragraph 2.01, GENERAL. Acceptable manufacturers: Corbin, Schlage, Sargent, Best Lock Corporation.

2. Lock/Latchsets: Mortise type.

3. Handles: Lever type with circular rose.

3. Indicate lock functions appropriate for door location and use on hardware schedule, for Architect's approval.

C. Deadbolt lock:

1. Schlage BC 100 series grade 2 bored deadlock per ANSI156.5 for medium duty commercial application with key cylinder and thumbturn shall be Schlage BC 100 series

D. Closers:

1. Closers shall comply with BHMA/ANSI A156.4, Grade as specified above under Paragraph 2.01, GENERAL. Acceptable manufacturers: LCN, Corbin, Russwin, Sargent.

2. Closers shall be surface-mounted in a rectangular metal case with eased edges, sprayed dull brass lacquer finish, unless designated otherwise, heavy-duty type; LCN "Smoothie" 4010-4020^a4110 series, Corbin 110 series, Norton 7700 series, Russwin 2810 series, Sargent 350 series.

3. Closers shall have adjustable back check, adjustable closing and latching speeds, and 50% spring power adjustment.

4. Provide closer sizes as recommended by manufacturer for door size and use. Mount closers on hinge face of door, except use parallel-arm type on stop at face of out-swinging exterior doors and at doors swinging into corridors.

5. At exterior doors, use LCN Cush-N-Stop, heavy-duty closer-stop with manual hold-open where called for.

E. Stops: . Floor stops: Ives FS444

1. Provide wall, floor or door stop at all doors, as selected by Architect, one of following:

- Ives 400 Series or equal, convex bumper-type wall stop.
- Ives 436/438 Series or equal, dome-type floor stop.

2. Stops may be omitted at doors with overhead stop/hold-open and doors with closers striking walls at 120 degrees or more. Do not mount wall stops on gypsum board walls.

- F. Provide silencers at all doors, three per strike jamb, two per head at pairs of door.
- G. Protective plates: .050 in thick steel, finish as specified above under Paragraph 2.01, GENERAL, with bevelled edges. Size and mount plates so as to leave 1/4 inch clearance between bottom edges of plate and door, 1/2 inch clearance between side edges of plate and door when door is closed. Mount plates on push side of doors. If not shown otherwise on drawings, sizes shall be as follows:
 - 1. Push Plates: Protective plates: Ives 8400 10" X 2" LDW
- H. Door pulls: match existing.
- I. Thresholds: Flat grooved bronze saddles, 1/2 inch high, 5 " deep, Zero 654 or equal by Pemko or Hager. Provide thresholds at all exterior doors, whether or not shown on drawings. Threshold: bronze threshold NGP 425BR (or other width as required) 720
- J. Weatherstripping: NGP seals 5020 (verify color);C627 (VERIFY FINISH)

2.03 KEYING

- A. Match Owner's existing keying system.
- B. Equip locks with manufacturer's 7-pin removable core cylinders.
- D. Construct keys and lock cylinder parts from brass, bronze, stainless steel or nickel silver.

2.04 HARDWARE SETS (See Drawings)

PART 3 – INSTALLATION

3.01 INSTALLATION

- A. Furnish templates and schedules as required to door and frame manufacturers.
- B. Before beginning installation, verify that openings and cut-outs have been provided as required and that doors and frames are properly constructed and reinforced to receive hardware.
- C. Install hardware in accordance with manufacturer's instructions.
- D. Hardware location dimensions from bottom of frame to center-line of installed item: per Table V in ANSI/SDI 100, including following:
 - Top hinge: Up to 11-3/4" from rabbet section of head of frame.
 - Bottom hinge: Up to 13" from bottom of frame.
 - Intermediate hinge: Halfway between top and bottom hinges.
 - Locksets, latchset, panic exit devices: 40-5/16" to center-line of strike.
 - Push and pull bars: 42".

- Push Plates: 45".
- Deadlocks: 60" to center-line of strike, except where deadlock is incorporated in push plate.

3.02 COMPLETION

A. At completion of job, manufacturer's representative of the locks, closers and exit bolts consultant shall inspect entire installation and certify in writing to Architect that installation is satisfactory.

B. Verify that all items are securely attached and properly aligned and adjusted. Carry out final adjustments on door closers, and instruct Owner in subsequent maintenance.

C. The Contractor shall supply extra screws and other attachment devices, installation tools and maintenance and repair instructions with hardware for use by the Owner.

END OF SECTION

**SECTION 08800
GLASS AND GLAZING**

PART 1.00 – GENERAL

1.01 GENERAL

- A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 – Specification Sections apply to this Section.
- B. Provide all plant facilities, labor, materials, tools, equipment, transportation, supervision, and related work necessary to complete the work specified in this Section and as shown on the Drawings.

1.02 DESCRIPTION OF WORK

- A. The work shall include careful examination of the drawings to determine quantities, options, locations, sizes, types and details of work described in this section, including but not limited to the following:
 - 1. Laminated (safety glass).
 - 2. Plate glass.
 - 3. Wire glass.
 - 4. All related accessory items such as setting block, spacer shims, neoprene channels are required for a complete installation of the work of this section.

1.03 RELATED WORK

- A. Section 06100 – Carpentry
- B. Section 07920 – Sealants and Caulking
- C. Section 08200 – Wood Doors

1.04 REFERENCES

- A. ANSI Z97.1 Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings
- B. ASTM E84 Surface Burning Characteristics of Building Materials
- C. FS DD-G-451 Glass, Float or Plate, Sheet, Figured (Flat, for Glazing, Mirrors and Other Uses)
- D. FS DD-G-1403 Glass, Plate (Float), Sheet, Figured, and Spandrel (Heat Strengthened and Fully Tempered)
- E. FS TT-G-410 Glazing Compound, Sash (Metal) for Back Bedding and Face Glazing (Not for Channel or Stop Glazing)
- F. FS TT-S-227 Sealer Compound: Rubber Base, Two Component (for Caulking, Sealing and Glazing in Building Construction).
- G. FS TT-S-230 Sealing Compound: Synthetic Rubber Base, Single Component, Chemically Curing for Caulking, Sealing and Glazing in Building Construction

- H. CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials
- I. ASTM C 509-70 Cellular Elastomeric Performed Gasket and Sealing Material
- J. FS TT-S-1543 Sealing Compound: Silicone Rubber Base (for Caulking, Sealing and Glazing in Buildings and other Structures)
- K. FS TT-S-001657 Sealant Compound: Single Component, Butyl Rubber Based Solvent Release Type (for Buildings and other Types of Construction)
- L. SIGMA No. 64-7-2 Specification for Sealed Insulating Glass Units
- M. FGMA Glazing Manual and Sealing Manual

1.05 QUALITY ASSURANCE

- A. Conform to Flat Glass Marketing Association (FGMA) Glazing Manual and Sealing Manual for glazing installation methods.
- B. Installer Qualifications: Not less than five years experience on comparable projects.
- C. Each light of glass shall be labeled in accordance with the building code having jurisdiction over the project. Label shall be located in the lower right hand corner of each light.

1.06 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Provide structural, physical, and environmental characteristics; size limitations; special handling or installation requirements.
- C. Provide data on glazing sealant. Identify colors available.
- D. Submit sealed glass units manufacturer's certificate indicating units meet or exceed specified requirements
- E. Submit manufacturer's warranty for insulating units.

1.07 DELIVERY, STORAGE AND PROTECTION

- A. Deliver, store, and protect products at site under provisions of Section 01600.
- B. Deliver all glass with manufacturer's label attached and intact.
- C. Do not remove labels until glass has been installed.
- D. Keep glass face from contaminated materials capable of staining glass.
- E. Delivery glazing compounds and sealants in manufacturer's unopened, labeled containers.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Perform glazing when ambient temperature is 50 degrees F or above.
- B. Perform glazing on dry surfaces only.

1.09 WARRANTY

- A. Furnish manufacturer's standard written warranty insuring sealed insulated glass units for a period of 10 years from Date of Substantial Completion against material obstruction of vision resulting from film or dust collecting between interior glass surfaces and seal failure.

PART 2 - PRODUCTS

2.01 ACCEPTABLE GLASS MANUFACTURERS

- A. PPG Industries
- B. Hordis Brothers, Inc.
- C. Libbey-Owens-Ford Company
- D. Globe Amerada Glass Company
- E. ASG Industries, Inc.
- F. Approved equal domestic manufacturer.

2.02 MATERIALS

- A. General:
 - 1. Provide glass in thicknesses and sizes shown on the drawings.
 - 2. Each type of glass shall be the product of one manufacturer to insure uniform color throughout the building.
- B. Plate Glass:
 - 1. Float glass shall meet the requirements of ASTM C0-1036, Type 1, transparent flat, Class 1 clear, low E, Quality q3 glazing select; 1/4" thick minimum, or as otherwise shown on drawings.
- C. Laminated Glass:
 - 1. Fabricated from two pieces of Type 1, Class 1, Quality q3 glass laminated together with a clear .060 inch thick polyvinyl butyryl interlayer. The total thickness shall be as indicated on Drawings.
- D. Insulated Glass Units:
 - 1. Aluminum entrance and storefront: provide solar reflective low E glass.
 - 2. Aluminum windows: provide clear low E glass.
 - 3. 1. Units shall be certified by Insulated Glass Certification Council or by an independent testing laboratory as complying with ASTM E 774, Class A. Insulating glass fabricator shall be a member of Sealed Insulating Glass Manufacturers' Association (SIGMA).

4. Units shall consist of two glass lights enclosing a hermetically sealed dry air space. Separate lights with a non-ferrous spacer containing a desiccant, with welded or soldered corners. Color of spacers: black. Double-seal joints between spacer and glass with a primary butyl seal and a secondary polysulfide or silicone sealant.

E. Glass Tempering: Temper glass by fabricator's standard process, which is demonstrated by standard tests. Tempered glass shall comply with Federal Specification DD-G-1403B and tempered or laminated glass shall comply with ANSI Z97.1-1984 (Safety Glass Code).

F. Neoprene Channels:

1. Neoprene channels for non fire-rated interior door glazing and vision panels, shall conform to shapes, profiles indicated to accommodate glass thickness indicated.
 - a. Neoprene channels made in 1 piece specifically to requirement of each pane of glass.
 - b. Corners shall be injection molded; no mitered or butt corners permitted.
 - c. Shore "A" durometer for glazing channels shall be 50 + 5.
 - d. Channels manufactured by The Standard Products Company, F.H. Maloney Company, or approved equal.

G. Setting Blocks, Edge Blocks, and Spacers:

1. Blocks and spacers shall meet the requirements of ASTM C-864.
2. Shims and spacer blocks shall be as approved by glass manufacturer.
3. Setting blocks shall have a Shore "A" hardness approximately 70 to 90.
4. Spacer shims shall have a Shore "A" hardness approximately 40 to 60.

H Elastomeric Gaskets:

1. Vinyl glazing gaskets for all aluminum entrances shall be as furnished under Section 08410 and installed by this section.

2.03 SAFETY GLAZING

A. The following applications shall comply with state building code requirements for safety glazing:

- 1 All glazing in doors.
 2. Glazed panels whose nearest vertical edge occurs within 48 in of door and whose bottom edge is below level of top of door.
 3. Other glazed panels in which lowest edge is less than 18 above floor; glazing area exceeds 9 sq. ft.; and walking surfaces occur on both sides within 36 in. of panel.

4. Both leaves of insulating glass covered above shall be safety glazed.
5. Safety glass 9 sq. ft. or less in area shall meet Category I (safe breakage at 150 ft. -lb. impact) requirements; larger lights shall meet Category II (safe breakage at 400 sq. ft lb impact) requirements.
6. Safety glass shall be either 1/4 in. heat-tempered glass; or laminated glass with a clear plastic interlayer between two 1/8 in. thick glass lights, minimum 0.015 in. thick interlayer for Category I, minimum 0.030 in. thick interlayer for Category II, except at skylight see Section 07820. Wired glass may not be used as safety glass, except where called for on drawings as part of a fire-rated assembly.

2.04 FABRICATION

A. Spacer Shims:

1. Spacing shall not exceed 48" o.c.; minimum of 2 spaces per edge.

PART 3.00 – EXECUTION

3.01 EXAMINATION

- A. Inspect frames and surrounds to be glazed prior to commencement of glazing work.
- B. Notify Architect of condition or defects which will prevent satisfactory installation and completion of work.
- C. Do not proceed until such defects and conditions have been corrected.
- D. Commencement of work shall be considered full acceptance of surfaces and conditions.
- E. Glazer shall verify compliance with following requirements:
 1. That frames are firmly anchored in proper position, plum and square within 1/8" of dimensions on approved shop drawings.
 2. That projections are removed from glazing rabbets to provide specified clearance.
 3. That corners and fabrication intersections are sealed and frames weathertight.

3.02 PREPARATION

- A. Compatibility: Before purchase of the specified glazing materials, investigate compatibility with the glazing material, channel surfaces, joint fillers and other materials in the glazing channel. Provide only joint fillers and other materials in the glazing channel. Provide only materials (manufacturer's recommended variation of the specified materials) which are known to be fully compatible with the actual installation condition, as shown by manufacturer's published data or certification.

- B. Glazing materials shall be installed on clean, dry, dirt-free and dust-free surfaces in accordance with manufacturer's recommendations, in weatherproof, waterproof manner.
- C. Clean surfaces to receive glazing materials with cleaning agents as recommended by glazing material manufacturer.

3.03 INSTALLATION

- A. Glass shall be installed in accordance with recommendations of FGMA Glazing Manual as specified herein, as required by drawings, and in accordance with manufacturer's recommendations.
- B. Remove glazing beads completely, perform glazing operations, set back in correct location; do not mar beads, screws, and the like.
- C. Provide shims, setting blocks, spacers as required.
- D. Glass shall be accurately cut to required sizes allowing for minimum required bite as per manufacturer's recommendations.
- E. Glass edges shall be clean cut.
- F. Glass cut incorrectly, damaged, or not meeting requirements specified shall be removed from job immediately.
- G. Laminated glazing shall be installed in "hazardous" locations as defined in the Massachusetts Building Code.

3.04 GLASS INSPECTION

- A. During construction phase periodic examination of installed glass shall be made, measures taken to prevent etching, staining of glass from concrete or masonry wash and accumulation of scum or any other condition.
- B. Glass which has become stained or etched through neglect of this precaution shall be replaced at no additional cost.

3.05 GLASS BREAKAGE

- A. Replace damaged or broken glass from any cause, with new glass of approved equal kind and quality at no extra cost and until the date of final acceptance of building by Architect.

3.06 GLASS DEFECTS

- A. Any vision glass which contains flaws, or perceivable defects shall be rejected and shall be removed from the project and replaced with equal likes of glass with no further increase in cost.

3.07 CLEANING

- A. At completion, remove dirt and stains. Wash and polish glass inside and out. Exercise care not to scratch or damage glass. Leave work in perfect condition, as approved by Architect. Remove all excess materials and debris resulting from work of this section.

END OF SECTION

SECTION 09250

**DRYWALL CONSTRUCTION AND VENEER PLASTER
(Combined Filed Sub-Bid for Section 09250 and 09260)**

PART 2 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The "Conditions of the Contract" and "Division 1, General Requirements" form part of this Section.

1.02 FILED SUB-BID REQUIREMENTS

A Bidding procedures shall be in accordance with latest edition of Massachusetts General Laws, Chapter 149, Section 44; and Chapter 30, Section 39M. Time and place for submission of sub-bids is given in Advertisement for Bids.

B Sub-bids for work under this Section shall be for complete work and shall be filed in a sealed envelope with Awarding Authority, at time and place specified in Advertisement for Bids. The following shall appear on face of envelope:

TOWN OF PLYMOUTH
SIMES HOUSE RENOVATIONS
[NAME OF SUB-BIDDER]
COMBINED SUB-BID FOR SECTION 09250 AND 09260, LATH AND PLASTER

C Every sub-bid submitted for work under this Section shall be on forms furnished by Awarding Authority, as required by Section 44 of Chapter 149 of General Laws, and specified in Advertisement for Bids.

D Sub-bids filed with Awarding Authority shall be accompanied by bid deposits in form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the Town of Plymouth; in compliance with Chapter 149, Section 44B. Amount of bid deposit shall be as specified in the advertisement for bids.

E. Work of this Section is shown on the following drawings: T1, A1.1, A1.2, A1.3, A2.1, A2.2, A3.1, A4.1, A4.2

F. Examine all other Sections of the specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this section.

G. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

H. This Section, together with Section 09260 - Interior Plaster Patching, comprises the Filed Sub-bid on Lath and Plaster.

1.02 SCOPE OF WORK INCLUDED IN THIS SECTION: In addition to work shown on drawings and specified elsewhere in this Section, provide openings for drywall access panels specified in Divisions 15 and 16.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A Wood stud framing: Section 06100.
- B Field-finishing drywall with paint: Section 09900.

1.04 SUBMITTALS: Issue submittals in accordance with Section 01300 Submittals, Shop Drawings, Product Data and Samples. Submittals under this Section shall include manufacturers' specifications and installation instructions on all specified products.

1.05 QUALITY ASSURANCE

- A Materials and installation shall comply with manufacturer's recommendations and Applicable standards, including following:
 - ASTM C 840, Standard Specification for Application and Finishing of Gypsum Board
 - ASTM C 919, Practices for Use of Sealants in Acoustical Applications
 - GA 216, Recommended Specifications for Application and Finishing of Gypsum Board
- B Refer to General and Supplementary Conditions for general provisions covering material storage, installation, and substitutions.

2 PRODUCTS

2.01 GYPSUM WALLBOARD AND ACCESSORIES

- A. Acceptable manufacturers: Domtar, Georgia-Pacific, Gold Bond, USG.
- B. Gypsum wallboard panels shall consist of a fireproof gypsum core encased in a heavy manila-finished paper on face side, and a strong liner paper on back side, with face paper folded around long edges to protect core. Panels shall conform to ASTM C 36, 4 ft. wide, lengths to minimize field joints, with long edges tapered on face side to form a shallow channel for joint reinforcement. If not noted otherwise, panels shall be regular type. Thickness: per drawings.
- C. Backer board for veneer plaster ; high-density gypsum core with special absorption face paper designed for veneer plastering, USG Imperial Gypsum Base, Georgia-Pacific ToughRock Plaster Base, or equal, per ASTM C 588.
- D. Use fire-rated Type X where shown as fire-rated type on drawings, USG Firecode, Gold Bond Fire-Shield, or G-P Firestop.
- E. As a substrate for ceramic wall tile, use reinforced cementitious boards specified below in this Section. Use moisture-resistant gypsum board, USG W/R Panels or equal, complying with ASTM C 630, at painted bathroom walls.

- F. Accessories for control joints, edge trim, and corner beads: per ASTM C 1047, manufacturer's recommended galvanized metal, with only thin edge of trim visible after installation of joint compound; USG 200 series (edge trim), USG #093 (control joint), USG Dur-a-bead (corner bead), or equal.
 - G. Joint reinforcement materials: paper or mesh joint tape and joint compound as recommended by drywall manufacturer, per ASTM C587.
 - H. Use screws, nails, adhesives as recommended by manufacturer for particular installation.
 - I. Acoustical insulation: blanket type, as specified in Division 7 insulation Section. Acoustical sealant: butyl or latex caulking compounds specified for interior use in Division 7 sealants Section; or special acoustical sealant complying with ASTM C 919, such as Tremco Acoustical Sealant, Pecora PA-98, or PTI 808.
- 2.02 CEMENTITIOUS BOARDS: fiberglass-reinforced light-weight cementitious panels, Wonderboard Sheathing Board, USG Durock Tile Backing Board, or Laticrete EP Board; 1/2 in. thick. Georgia-Pacific Dens-Shield, mesh-reinforced vapor-retardant-treated gypsum panel, may also be used.
- 2.03 VENEER PLASTER:
- A. Veneer plaster shall be one coat application, complying with ASTM C587, smooth trowel finish.
 - B. Acceptable products include Georgia-Pacific PearlCote veneer plaster, Gold Bond Kal-Kote, USG Imperial Finish, or equal veneer plaster.
 - C. Color: manufacturer's standard white or gray, to be field painted.
 - D. Water: clean and potable.
 - E. Plaster thickness: 3/32 inch.

3 EXECUTION

3.01 JOB CONDITIONS

- A. Store materials in conformance with provisions of General and Supplementary Conditions. Store drywall under cover, flat, off floor. Do not store long over short lengths. Avoid overloading floor system. Protect adhesives and sealants from freezing.
- B. Maintain temperature between 55 degrees F and 70 degrees F for 24 hours before, during, and 24 hours after wallboard installation.
- C. Provide ventilation during and following adhesive and joint treatment applications, and to carry off excess moisture. Use temporary air circulators in enclosed areas lacking natural ventilation. Under slow drying conditions, allow additional drying time between coats of joint treatment. Protect installed materials from drafts during hot, dry weather.

3.02 WALLBOARD INSTALLATION

- A. Wallboard -- general:

1. If not noted otherwise on drawings, carry wallboard full height both sides of stud wall framing to bottom of deck above. Notch wallboard carefully around ceiling structural members or other irregularities, and fill all gaps with mineral-fiber insulation or pre-molded fillers.
2. Cut wallboard by scoring and breaking, or by sawing, working from face side. Neatly cut and seal cut-outs for piping, etc. Scribe neatly where board meets projecting surfaces. Edges and ends of board to receive casings shall be straight and true to receive full bearing for casings.
3. Install boards horizontally (perpendicular to studs) or vertically (parallel to studs) as directed by Architect. Position all edges over studs for parallel installation, ends over studs for perpendicular installation.
4. Locate joints at openings so that no end joint aligns with edge of opening. Stagger end joints. Do not locate joints on opposite sides of partitions on same stud.
5. Center abutting ends or edges over studs or furring channels. Attach screws at least 3/8 in. from panel edge, 8 in. o.c. at fire-rated assemblies and 8 in. o.c. staggered at drywall board edges, 12 in. o.c. in center area of board.
6. Apply galvanized metal corner reinforcement at horizontal and vertical exterior corners, except use flexible tape where wallboard is to receive ceramic tile.
7. Apply galvanized metal casings where gypsum wallboard abuts dissimilar materials, and joint is exposed. Leave a uniform 3/16 in. joint.
8. Apply uniform thin layer of joint compound over joint, approximately 4 in. wide. Center tape over joint and embed into compound, leaving sufficient compound over tape to provide proper bond.
9. Treat internal corners in manner specified for joints, except fold tape lengthwise through middle and fit neatly into corner.
10. Allow compound to dry thoroughly, a minimum of 24 hours between coats.
11. Cover tape with compound, spread evenly over tape and neatly feathered 3 in. beyond tape edges. When dry, cover with another coat of compound, with a smooth uniform slight crown over joint, feathered 3 in. beyond preceding coat.
12. Dimples at nail or screw heads shall receive three coats of compound
13. Conceal flanges of metal corner beads, control joints, and miscellaneous trim with at least two coats of compound, which when finished shall extend approximately 8 in. from exposed nosing.
14. Sand all coats as necessary after each application of compound has dried. Final coat, after sanding, shall leave wallboard and treated areas smooth and ready to receive finish. Take care not to scuff paper surface of board when sandpapering. Replace scuffed board.

15. At partitions containing sound insulation, provide a bead of acoustical sealant under floor track, at non-taped wall and ceiling junctions between casing and dissimilar materials, at floor line between bottom of wallboard and floor before installation of base, at edges of drywall panels at control joints, and around cut-outs in wall such as electrical boxes and switches. Firmly friction-fit insulation between studs full height of wall, fitting carefully behind electrical boxes and other penetrations, and securing to back of wallboard with staples or adhesive.

B Install moisture-resistant board with un-cut long edge at bottom of work, and space 1/4 in. above edge of base or fixture. Seal ends, cut-edges, and penetrations of each piece with sealant.

C Install reinforced cementitious boards level and true, with board faces neatly aligned. Center abutting ends or edges over studs. Attach screws at least 3/8 in. from panel edge, 8 in. o.c. staggered at board edges, 12 in. o.c. in center area of board. Allow a 1/16-to-1/8 in. joint between adjacent boards. Fill joint with grout, and cover with fiberglass tape.

3.02 VENEER PLASTER INSTALLATION

A. Application shall conform to ASTM C 843. Finished plaster surfaces shall be evenly applied and properly trowelled, and have a surface of even color, without stain, marks, or defects. Surfaces shall be straight edged and plumb or level in every direction, jambs and angles straight.

B. Accurately proportion materials for each plaster batch with measuring devices of known volume. Size batches for complete use within one hour after mixing. Retemper plaster stiffened from evaporation, but do not use or retemper partially hydrated plaster. Do not use caked or lumpy materials.

C. Clean mechanical mixer of set or hardened materials before loading for a new batch. Maintain mixer in continuous operation while adding materials. Conform to mixing sequences and times recommended by the manufacturer.

D. Tightly scratch veneer plaster into previously treated joints and corner beads, then immediately scratch in tightly over the wall and/or ceiling area. Double back over the area just scratched with material from the same batch to a total thickness of 3/32 (2.4 mm). When double-back coat is completed, immediately drop back and begin dry troweling or closing in the surface, filling in all voids and trowel laps, leaving the wall smooth and ready to receive the first light water troweling

E. After the first light water troweling is completed, check the material for the beginning of the initial set. When material starts to set, final water polish troweling should begin.

3.03 JOB COMPLETION

A. At completion of installation, clean and sand wallboard as required to provide acceptable base for finishing. Remove loose screws and replace with new screws approximately 1-1/2 in. from old, patching damaged surface with compound. Fill cracks with compound, finish smooth and flush.

B. Repair joint ridging as required. Sand ridges in reinforcing tape without cutting through tape. Fill

concave areas on both sides of ridge with topping compound. After fill is dry, blend in topping compound over repaired area.

END OF SECTION

SECTION 09620

**INTERIOR PLASTER PATCHING
(Combined Filed Sub-Bid for Section 09250 and 09260)**

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 FILED SUB-BID REQUIREMENTS

A Bidding procedures shall be in accordance with latest edition of Massachusetts General Laws, Chapter 149, Section 44; and Chapter 30, Section 39M. Time and place for submission of sub-bids is given in Advertisement for Bids.

B Sub-bids for work under this Section shall be for complete work and shall be filed in a sealed envelope with Awarding Authority, at time and place specified in Advertisement for Bids. The following shall appear on face of envelope:

TOWN OF PLYMOUTH
SIMES HOUSE RENOVATIONS
[NAME OF SUB-BIDDER]
COMBINED SUB-BID FOR SECTION 09250 AND 09260, LATH AND PLASTER

C Every sub-bid submitted for work under this Section shall be on forms furnished by Awarding Authority, as required by Section 44 of Chapter 149 of General Laws, and specified in Advertisement for Bids.

D Sub-bids filed with Awarding Authority shall be accompanied by bid deposits in form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the Town of Plymouth; in compliance with Chapter 149, Section 44B. Amount of bid deposit shall be as specified in the advertisement for bids.

E. Work of this Section is shown on the following drawings: T1, A1.1, A1.2, A1.3, A2.1, A2.2, A3.1, A4.1, A4.2

F. Examine all other Sections of the specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this section.

I. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

J. This Section, together with Section 09250 - Drywall Construction and Veneer Plaster, comprises the Filed Sub-bid on Lath and Plaster.

1.2 SECTION INCLUDES

A. Work of this Section includes all labor, materials, equipment and services necessary to complete the plaster patching work for existing ceilings and walls scheduled to remain as specified herein, including

but not limited to, the following:

1. Contractor shall survey all areas where existing plaster is shown to remain and to be repaired, in order to verify extent of patch or repair. Scope of work to include plaster patching where called for in the Restoration Schedule.
2. Cutting out and removing existing interior plaster surfaces where needed to repair existing gypsum plaster.
3. Cutting out and removing existing plaster on walls and ceilings as required for installation of new work.
4. Repair and patching cracks, spalls, delaminations, breaks, losses, chips, holes or other defects in gypsum plaster surfaces.
5. Providing plaster accessories and associated Work.
6. Providing new plaster to align with existing plaster at existing walls and ceilings.
7. Plaster patching and new plaster ceilings to match historic conditions of: plaster on wood lath, plaster on wire lath or plaster on wire lath over plaster on wood lath.
8. Cleaning of all existing plasterwork on the walls and ceilings of the existing building within the room included in the scope of work.

B. Qualifications of Historic Plaster Repair Contractor: Must be experienced in all phases of historic plaster repair, specifically lime based plasters, the preservation and reproduction thereof. The contractor must have six years and/or four projects of similar historical significance. They should have had training at a nationally recognized hands-on training program in historic plaster repair that stresses the stabilization of historic plaster with conservation adhesives.

1.3 RELATED SECTIONS

- A. Section 09250 Drywall and Veneer Plaster.
- A. Section 09900 Painting.

1.4 QUALITY ASSURANCE

- A. Conform to the following standards:
 1. ASTM C 841 - Standard Specification For Installation Of Interior Lathing And Furring
 2. ASTM C 842 - Standard Specification For Application Of Interior Gypsum Plaster
 3. ASTM C 847 - Standard Specification For Metal Lath
 4. ASTM C 28 - Standard Specification For Gypsum Plasters
 5. ASTM C 631-81 - Standard Specification For Bonding Compounds For Interior Plastering
 6. ASTM C 35 - Standard Specification For Inorganic Aggregates For Use In Gypsum Plaster
 7. ASTM C 206 - Standard Specification For Finishing Hydrated Lime
- B. Allowable Tolerances: All plaster repairs shall be keyed and feathered to exactly match and continue edges and contours of existing plaster work. Repairs shall be true and flat in connections with adjacent surfaces when checked with an 8 ft. straight edge; do not exceed 1/8 inch variation in 8 ft. for bow, warp, plumb, or level for flat and curved surfaces.
- C. Defects
 1. Plastering with defects of such character as will mar the appearance of finished Work, or which is otherwise defective, shall be rejected, removed and replaced at the Contractor's expense.
 2. All ridges, ledges and visual irregularities shall be rejected, removed and plaster replaced at the Contractor's expense.
 3. Any defects or irregularities of plaster restoration work telegraphing through paint shall be cause for rejection of the Work. The Contractor shall remove any subsequent work, remove and replace the defective or irregular plaster restoration work and have the subsequent work replaced by skilled workman in the appropriate trades, to the satisfaction of the Architect, at the Contractor's expense.

1.5 SUBMITTALS

- A. Materials List: Before any materials are delivered to the job site, submit a complete list of all the materials proposed to be furnished and installed.
- B. Product Data: Submit manufacturer's product data for plaster materials, lath, metal support components, and accessories; including manufacturer's current recommendations as to methods and installation.
- C. Lath Samples: Submit samples of wood and metal lath.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer.
- B. Store materials inside, under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes. Neatly stack gypsum lath flat to prevent deformation.
- C. Handle gypsum lath to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after application of plaster.
- B. Ventilation: Ventilate building spaces in compliance with ASTM C 842 and as required to remove water in excess of that required for hydration of plaster. Begin ventilation immediately after plaster is applied and continue until it sets.
- C. Protection
 - 1. Restoration of existing plaster shall be done in such manner as not to cause damage to contiguous work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Gypsum Plaster: ASTM C28. Neat plaster for hand application of scratch coat over metal lath, concrete and terra cotta shall contain not less than 0.01 percent by weight of synthetic or vegetable fibers or not less than 0.02 percent by weight of mineral fibers.
- B. Bond Compound: A plaster bonding compound having special bonding properties shall be used for application to concrete surfaces that have been sufficiently roughened to provide a mechanical key. The Bond Compound shall be "Plaster Weld" made by Larsen Mfg. Co. or approved equal. It shall be mixed and applied in strict accordance with the Manufacturer's directions.
- C. Plaster Crack Patching Compound: Provide "Sheetrock All Purpose Joint Compound Ready Mixed" as manufactured by U.S. Gypsum Co., or approved equal made by DAP; apply per manufacturer's recommendations.
- D. Special Finishing Hydrated Lime: ASTM C-206. Lime putty shall be made from special finishing hydrated lime, machine mixed with water to form a putty and allowed to stand for at least 15 minutes before using. Approved measures shall be taken to protect the putty from sun and to prevent excessive evaporation when stored.
- E. Sand: ASTM C35. Graduation of natural or manufactured sand for plaster shall be as follows:

U.S. Standard Sieve Size No.	Percentage Retained	
	Max.	Min.

4	0	0
8	10	0
16	40	10
30	65	30
50	100	95
100	100	95

F. Basecoat Plasters (course stuff), for application on wood lath or masonry

Mix lime putty, 1:3, with sand, for the scratch coat, well haired

Mix lime putty, 1:2.0-2.5, with sand, for the float coat, haired

OR: formulate according to mortar analysis or volumetric test

2-2 Finish coat Plasters or small area, crack repair

Mix lime putty, 1:1, with graded sand, for the finish coat,

OR;

Mix lime putty, 3:1, with gauging plaster

OR;

Mix according to the mortar analysis or volumetric test

2-3 Gauging Plaster

USG Champion Quality Gauging Plaster or equal

2-4 Lime

Lime putty that has emley plasticity greater than 400, 98% or better calcium, and a high surface area of 30m²/gram or better. Lime putty matching these specifications is available from Traditional & Sustainable Building, www.traditionalandsustainable.com at 443-822-0983, or approved equal.

Or match the existing historic sand as determined by the CO and/or the mortar analysis.

G. Fiber for Scratch and Float coats

The allowable fibers are as determined by mortar analysis or as follows in order of priority, hemp, goat hair, cattle hair, hog hair, jute, sisal, or manila. The fiber should be 1" to 1

H. Water: Clean, fresh, potable, and free from injurious amounts of oils, acids, alkalis and organic matter injurious to the plaster.

I. Metal Accessories: Grounds and casing corner beads shall be zinc-coated sheet steel, 26 ga. or heavier, with expanded or perforated flanges or clips so shaped and fabricated as to permit complete embedment in the plaster.

J. Wood Lath: Use 1-1/2"x3/8" wood lath to match existing historic.

K. Wire Lath: Galvanized metal lath.

L. For wood lath to wood framing, stainless steel, ring shank siding nails.

For metal lath to wood framing, galvanized or stainless steel bugle head deck screws and galvanized metal plaster washers

2.2 MIXING OF PLASTER

A. Mix and apply plaster in accordance with the directions of the manufacturer.

B. Texture of finishing coat shall match existing plaster.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions where plaster work is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until

unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Architect.

3.2 GENERAL

A. Sequence plaster installation properly with the installation and protection of other work, so that neither will be damaged by the installation of others work.

B. Cut out and replace all unbonded spots. Build in the work in others and do all cutting and patching of plaster in this connection. Where abutting other built-in materials, plaster shall be finished tightly against them and neatly trimmed unless otherwise indicated.

C. At exposed wood lath, re-secure to existing framing with stainless steel nails or pre-drill holes for deck screw attachment. Clean out keys and vacuum clean. Attach perimeter of sound plaster with an approved conservation adhesive, allow to coalesce as necessary. Rake perimeter of hole, to cut it back, for replacement plaster to tuck in behind the existing plaster.

D. Dampen wood lath until the surface is damp.

E. Replace missing wood lath with similar materials. It is not appropriate to mix wood and metal lath.

F. At existing sound plaster bases/ delaminating top coats: Determine, in consultation with the CO, which delaminations are to be saved and which are to be removed. Reattach the ones that are to be saved with the conservation adhesive and remove the others.

G. The cracks are not to be raked out. This cuts the fiber binder that is still bridging the crack. This raking would weaken the plaster stability. If the fibrous binder is rendered by the width of the crack it is permissible to rake out the crack after stabilization with adhesives.

H. Application of plaster

1. Large area repair, adhere the perimeter of the opening and fill with two to three layers of the lime/sand/hair basecoat plaster, no more than 5/16" per coat, and a finish coat, flush with the surrounding surfaces.

2. Small area repair, two inches or larger, fill with large area material, smaller, fill with crack fill material, flush with the surrounding surfaces.

3. Crack fill rake out crack, (only if fibrous binder is rendered, if crack fiber is intact do not rake out) to approximately 1/2" depth and fill with non sanded finish coat material, flush with the surrounding surfaces. If crack is not open then topping with a thin layer of ready mix joint compound after stabilization is appropriate.

4. Surface delaminations, remove as necessary, and replace with non-sanded finish coat material, flush with the surrounding surfaces.

5. Skim surface for cosmetic effect with joint compound, either ready mix or setting type.

6. Moldings, remove old repairs, evaluate conditions in conjunction with CO and decide on course of repair. Repair to follow crack repair specifications keeping true to profile.

7. Plaster thicknesses indicated shall be considered as a minimum; plaster shall be of such thickness required to plumb and square wall surfaces so that plaster is flush with adjacent surfaces.

8. Replicate, repair and restore flat wall and ceiling plaster as indicated.

9. Plaster repairs shall be executed edge to edge in long strips or large areas for each separate coat. Where breaks are necessary lap new work over adjoining work.

10. Bring finished surfaces of plaster to true planes and when complete surface shall be clean, free from blisters, pits, discoloration, cracks or other defects. In all cases the plastering throughout is to be delivered clean and perfect in every respect.

3.3 QUALITY ASSURANCE:

A. Applicator/Installer Qualifications:

1. Scrub all walls and ceilings to remove dirt, soot, dust and stains.

2. Use a mild detergent solution and a soft bristle scrub brush to scrub all walls and ceilings. Rinse and dry walls and ceilings with a squeegee.

3. Minimize water usage to avoid excessively wetting work area. Use towels or drop cloths to prevent water accumulation on floors. Dry floors with towels immediately if water gets on floor surfaces. Dry surfaces immediately after rinsing.

B. Remove all loose and flaking paint, wallpaper, spalled plaster, insect nests, spider webs and other foreign substances.

1. Use scrapers to remove all loose and flaking paint on all walls and ceilings. Remove all painted finishes where the condition of the existing painted surface is unsuitable for receiving finishes by scraping or stripping.

2. Use scrapers to remove all wallpaper that has come unglued from wall or ceiling surface. Use a steamer and scraper to remove adhered wallpaper where indicated for removal or wall paper is unsuitable for receiving new finishes.

3. Scrape off all other foreign materials down to sound plaster.

4. Do not gouge walls or ceiling while scraping. Keep scraper blade flat and almost normal to the surface.

3.1 PREPARATION

A. Inspect all surfaces to be plastered before beginning Work and correct all defects which will affect the proper execution of this Work.

B. After cleaning all existing plaster surfaces, mark surfaces and plaster areas where plaster is to be removed with chalk as determined by tapping or sounding walls, ceilings and partitions to determine if plaster is bonded to substrate.

C. If plaster is sound, examine surface for defects such as cracks, gouges, spalls, loose or other surface damage that is damaged, mark areas affected.

D. Obtain Architect's approval for areas marked to be repaired before commencing demolition work.

E. Removal of Plaster: Carefully remove existing damaged plaster not removed under demolition and wood lath and salvage the wood lath. Inspect wood lath in all existing plaster walls and partitions. Remove plaster carefully without breaking or damaging wood lath. When lath is exposed, remove lath intact without pry marks, splitting or other damage. Do not damage the Substrate or assembly to which later is attached. Remove fasteners from lath and Substrate. Carefully extract fasteners to avoid splitting. Clean and salvage all lath, removing all residue of plaster. Dress edges of plaster removal area to . Remove loose bits of plaster. Prepare removal area for Re-installation of wood later and plaster work.

F. Use chisels or other cutting tool to clean and shape surface defects edges to a minimum 1/16 inch depth.

Widen holes and cracks to permit adequate patching plaster penetration to sufficiently bond. Scrape off loose or spalling plaster to sound plaster Substrate. Shape edges of gouges and dents to receive patching plaster of sufficient thickness (minimum 1/16 inch deep) without feathering.

G. Cracks: Hairline cracks, random cracking and checking shall be repaired using plaster crack patching compound specified herein.

H. Bonding compound shall be applied to all plaster, concrete and masonry surfaces for all plaster repairs.

Application shall be in strict accordance with manufacturer's written recommendations and first and brown coats shall be applied directly over bonding compound.

I. All preparation shall be done with compatible materials and methods that will not compromise the integrity o the plasters, and will not telegraph through finished surfaces.

3.2 GYPSUM PLASTER APPLICATION, GENERAL:

A. Prepare existing plaster surfaces for bonded base coats and use bonding compound or agent.

B. Tolerances: Do not deviate more than 1/8 inch in 10'-0" from a true plane in finished plaster surfaces, as measured by a 10'-0" straightedge placed at any location on surface.

- C. Sequence plaster application with the installation and protection of other work so that neither will be damaged by the installation of the other.
- D. Plaster flush with existing surfaces.
- E. Apply thicknesses and number of coats of plaster as required by the depth of the defect to the surface.

3.3 GYPSUM PLASTER APPLICATION ON METAL AND WOOD LATH

- A. For Metal and Wood Lath Apply in Three (3) Coats: Scratch Coat, brown coat and finish coat.
- B. Scratch Coats: Apply with sufficient material and pressure to form full bond with solid base materials. Scratch the surface to form a bond for the brown coat.
- C. Brown Coats: Do not apply brown coat until after the scratch coat has hardened, and not less than 24 hours after application of the scratch coat. All joints in brown coat plaster shall be lap joints. After drying, all shrinkage cracks shall be cut out and filled with scratch coat plaster.
- D. Mix scratch and brown coats shall be mixed in the proportions of 100 lbs. gypsum neat plaster to 2-1/2 cu. ft. of sand. Scratch and brown coats of fibered gypsum plaster shall be mixed in the proportions of 100 lbs. fibered gypsum plaster to one cu. ft. of sand.
- E. Finish Coats: Gypsum gauging plaster finish. Mix in the proportion of one part calcined gypsum, to 3 parts of lime putty by volume. Apply bonding compound to existing base coat and then apply finish coat over base coat of gypsum plaster. The finish shall be allowed to draw a few minutes and then shall be well troweled with water to a smooth finish, free from blemishes. The thickness of finish coat shall be from 1/16" to 1/8" and total thickness of gypsum plaster shall be as indicated but no less than 5/8".

3.4 FINISHING

- A. Cut, patch, point-up and repair plaster as necessary to restore shrinkage cracks, dents and imperfections. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry-outs, efflorescence, sweat-outs and similar defects, and where bond to the substrate has failed. Patched surfaces in existing plaster surfaces shall be imperceptible.
- B. Sand smooth-troweled finishes lightly to remove trowel marks and arrises.
- C. Remove temporary protection and enclosure of other work. Remove plaster from other surfaces which are not to be plastered. Repair floors, walls and other surfaces which have been stained, marred or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers and equipment and clean floors of plaster debris.
- D. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures plaster work being without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 09300

CERAMIC TILE

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Attention is directed to the General and Supplementary Conditions and Division I, including all subdivisions thereof, as listed in the Table of Contents, which are made a part of this section.

1.02 DESCRIPTION

- A. Furnish all labor, materials, equipment and services necessary for proper and complete
- B. installation of ceramic tile and accessories, as shown on the Drawings and as herein specified.
- C. Scope of work generally includes, but is not limited to, ceramic mosaic tile floor and ceramic tile walls.
- D. Plumbing fixtures, and other items are scheduled to be penetrate or applied to tile work. Tile subcontractor shall obtain all applicable templates, and shall drill through ceramic tile materials at all required locations.

1.03 SEE ALSO THE FOLLOWING SECTIONS

- A. SECTION 06100 - ROUGH CARPENTRY, regarding coordination of built-in wood blocking requirements.
- B. SECTION 07900 - SEALANTS, regarding sanitary silicone sealant.
- C. SECTION 09250 - GYPSUM DRYWALL, regarding coordination of built-in wood blocking requirements and backing and underlayment material for ceramic tile.
- D. SECTION 10800 - TOILET AND BATH ACCESSORIES, regarding coordination of toilet accessories.
- E. SECTION 220001 - PLUMBING, regarding plumbing fixtures to be applied over ceramic tile.

1.04 QUALITY ASSURANCE

- A. Provide tile of standard grade conforming to Tile Council of America and ANSI 137.1.
- B. Acceptable manufacturers of Ceramic Tile:
 - 1. American Olean Tile Company.

2. Dal-Tile.
3. United States Ceramic Tile Company.

1.05 SUBMITTALS

- A. Colors and patterns of tile shall be as selected by the Architect from full range of manufacturer's samples to match the Housing Authority's existing tile.
- B. Samples: Submit in duplicate:
 1. Glazed wall tile and unglazed ceramic mosaic tile:
 - a. Panel for each color and type.
 - b. Minimum of four tiles per panel.
 2. Marble: submit 3"X 6" piece.
- C. Submit list of products and manufacturers proposed for use indicating that products comply with specifications and are suitable for intended use.
- D. Extra Stock: Provide one carton of each of glazed wall tile, and unglazed ceramic mosaic tile, of same colors as installed.

1.06 JOB CONDITIONS

- A. Comply with minimum temperature recommendations of manufacturers for bonding and grouting materials in latex-Portland cement mortar.
- B. Protect adjoining work surfaces before tile work begins.

PART 2 - PRODUCTS

2.01 TILE

- A. General Requirements:
- B. Standard grade: ANSI A137.1.
- C. Colors : As selected by Architect.
- D. Glazed Wall Tile:
 1. Description: glazed ceramic tile .

2. Conforming to SECTION 5, ANSI A137.1; cushion edges; colored bright-glazed; nominal sizes 4-1/4" x 4-1/4" x 5/16" thick; spacer lugs on edges of tiles. Tile shall be American Olean Bright & Matte series or approved equal.
3. Use: Bathroom walls, tub and shower surrounds, kitchen backsplash.

E. Unglazed Porcelain Type Ceramic Mosaic Tile:

1. Conforming to SECTION 6a, ANSI A137.1.; cushion edge; nominal size 2" x 2" x 5/16" thick.
2. Color: As selected by Architect.
3. Use: Bathroom floors.
4. Similar to American Olean Master Set System or approved equal.

F. Unglazed Encaustic Floor Tile

1. Encaustic geometric fired ceramic tiles, consisting of clay, not cement, with a colored surface layer at least 1/8 inch thick ; match size and thickness of existing tiles.
2. Color: As selected by Architect to match existing.
3. Use: replacement of missing and damaged tiles at Front Vestibule floor.
4. As produced by Minton Hollins (Johnson Tiles USA, 122 Tices Lane, East Brunswick, New Jersey, 08816 USA (732 698 0900) usa1@johnson-tiles.com)

G. Trim Shapes and Bases:

1. Same type and size as wall tile.
2. Include bases, caps, stops, returns, trimmers and other shapes necessary for a finished installation.
3. Color and finish: Match wall tile.
4. Unless otherwise noted, internal corners shall be square; external corners shall be bullnosed; base shall be coved.

H. Accessories:

1. Porcelain soap holder at tubs and showers, similar to American Olean No. BA725.

- I. Marble thresholds: Where floor tile terminates against dissimilar flooring material, provide natural marble threshold beveled as required for field conditions, centered under door or within frame, as shown on drawings or selected by Architect.
 1. Transition element shall comply with Massachusetts Architectural Access Board regulations (521CMR), Paragraph 29.2.
 2. Marble shall comply with standards of the Marble Institute of America and shall have a minimum abrasion resistance of HA13 per ASTM C241 with smooth sand finish on all exposed surfaces and color selected by Architect from lightly veined white or light buff range.

2.02 SETTING MATERIALS

- A. Wall and floor tile: Latex-Portland Cement Mortar, Conforming to ANSI A118.4.
- B. Reinforcing Mesh: Welded Wire Fabric, 2" x 2" 16/16 gauge.

2.03 GROUTING MATERIALS

- A. Conform to ANSI 118.6.
- B. Grout for glazed wall tile: Manufacturer's standard for sheet joining; color as selected by Architect.

2.04 SEALANT: Refer to SECTION 07900 - Sealants, for sanitary silicone sealant.

2.05 LATEX THINSET ADMIXTURE:

- A. ANSI A108.5 and ANSI A118.4, compounded and stabilized latex for blending with neat Portland cement or Portland-sand mix.
- B. Acceptable Manufacturer: American Olean (Model AO Latex Mortar Additive), Laticrete International (Model #4237), Hydroment/Bostik (Model #425). or equal approved by Architect.
- C. Latex Thinsset Admixture shall be mixed in accordance with manufacturer's recommendations for particular applications.
- D. Grout for unglazed floor tile: Manufacturer's standard for sheet mounting; color as selected by Architect.

PART 3 - EXECUTION

3.01 INSPECTION OF SURFACES

- A. Before installing ceramic tile materials, examine surfaces to receive these materials and accessories for defects or conditions adversely affecting quality and execution of tile installation.
- B. Do not proceed with installation work until unsatisfactory conditions have been corrected.
- C. Conditions of surfaces to receive tile:
 - 1. Surfaces shall be firm, dry, clean, and free of oily or waxy films.
 - 2. Grounds, anchors, built-in wood blocking, plugs, hangers, bucks, plumbing, electrical and mechanical work in or behind tile shall have been installed prior to proceeding with tile work.

3.02 INSTALLATION

- A. Prepare surfaces, fit, set, or bond, grout and clean in accordance with applicable requirements of ANSI Standards for the setting method specified, except as otherwise noted.
 - 1. Latex-Portland Cement Mortar: ANSI A-108.5 and AI 18.4
- B. Tile shall be hand sorted prior to installation.

3.03 WORKMANSHIP, CUTTING AND FITTING

- A. Install tile in a manner conforming with the best published practices of the industry.
- B. Do not cut tile excessively. Make no cuts smaller than half size. Make all cuts on the outer edges of the field.
- C. Smooth all cut edges with a Carborundum stone, and install no tile with jagged or flaked edges.
- D. Make corners of all tile flush and level with corners of adjacent tile, with due allowance to warpage tolerances for tile as specified in ANSI A137.1.
- E. Keep all joint lines straight and of even width, including miters.
- F. Provide patterns of tile as indicated on the Drawings.
- G. The finished tile work shall be clean and free of tiles which are pitted, chipped, cracked, flaked or scratched.

3.04 INSTALLATION OF MARBLE THRESHOLDS

- A. Setting bed mixes and installation procedures shall be as set forth in ANSI and TCA standards. Use procedures similar to and compatible with adjacent floor tile.
- B. Carefully cut marble thresholds in one piece, full width, to exact size with end profiles matching adjacent door frame profiles and with uniform end joints not exceeding 1/8" in width. Set thresholds in the same manner as adjacent floor tile to proper height and true level adhering soundly to substrate.

3.05 PROTECTION AND CURING

- A. Keep spaces in which tile is being set closed to traffic and other work until tile is firmly set. Protect tile from damage until acceptance.

3.05 CLEANING TILE

- A. Upon completion of setting and grouting, sponge and wash tile thoroughly, diagonally across joints. Finally polish with clean, dry cloths.

END OF SECTION

SECTION 09640

WOOD FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Solid-wood strip or plank flooring.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for wood substrates, including sleepers and subflooring.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show installation details including location and layout of each type of wood flooring and accessory.
- C. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work. Include sample sets showing the full range of normal color and texture variations expected.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed wood flooring similar in material, design, and extent to that indicated for this Project and whose work has resulted in wood flooring installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of material and product from one source with resources to provide materials and products of consistent quality in appearance and physical properties.
- C. Southern Pine Flooring: Comply with SPIB grading rules for species, grade, and cut.

- D. Softwood Flooring: Comply with WCLIB No. 17 grading rules for species, grade, and cut.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wood flooring materials in unopened cartons or bundles.
- B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.
- C. Store wood flooring materials in a dry, warm, well-ventilated, weathertight location.
- D. Move wood flooring into spaces where it will be installed, at least seven days before installation.

1.6 PROJECT CONDITIONS

- A. Conditioning: Maintain relative humidity planned for building occupants and an ambient temperature between 65 and 75 deg F (18 and 24 deg C) in spaces to receive wood flooring for at least seven days before installation, during installation, and for at least seven days after installation. After post-installation period, maintain relative humidity and ambient temperature planned for building occupants.
 - 1. For unfinished products, open sealed packages to allow wood flooring to acclimatize.
 - 2. Do not install flooring until it adjusts to the relative humidity of and is at the same temperature as the space where it is to be installed.
 - 3. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by flooring and finish manufacturers.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Wood Flooring: Equal to 1 percent of amount installed for each type and finish indicated.

PART 2 - PRODUCTS

2.1 SOLID-WOOD STRIP AND PLANK FLOORING

- A. Strip and Plank Flooring: Provide kiln-dried wood flooring as follows:
 - 1. Species: White pine quarter sawn heartwood
 - 2. Grade: Clear.
 - 3. Cut: Quarter sawn.

4. Thickness: 3/4 inch.
5. Face Width: 4 inches to 8 inches.
6. Matching: Tongue and groove, and end matched.
7. Backs: relief cut and channeled (kerfed) for stress relief.
8. Random Lengths: Provide standard random-length strips complying with applicable grading rules.

2.2 FINISHING MATERIALS

- A. Finish System: Complete system of compatible components that is recommended by finish manufacturer for application indicated.
 1. Type: Tung oil, satin finish.
 2. Stain: Penetrating and nonfading type.
 - a. Color: As selected by Architect from manufacturer's full range.
 3. Manufacturers: Subject to compliance with requirements, provide products by Waterlox, Inc.: Waterlox Sealer/Finish
- B. Wood Filler: Formulated to fill and repair seams, defects, and open-grain hardwood floors; compatible with finish system components and recommended by filler and finish manufacturers for use indicated. If required to match approved samples, provide pigmented filler.

2.3 ACCESSORY MATERIALS

- A. Felt Underlayment: ASTM D 226, Type I, No. 15, asphalt-saturated felt.
- B. Wood Flooring Adhesive: Mastic recommended by flooring and adhesive manufacturers for application indicated.
- C. Fasteners: As recommended by manufacturer, but not less than that recommended in NOFMA's "Installing Hardwood Flooring."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of wood flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with flooring manufacturer's written instructions, but not less than recommendations in NOFMA's "Installing Hardwood Flooring," as applicable to flooring type.

- B. Pattern: Lay wood flooring in pattern indicated on Drawings or, if not indicated, as directed by Architect.
- C. Felt Underlayment: Where strip or plank flooring is nailed to solid-wood subfloor, install flooring over a layer of asphalt-saturated felt.
- D. Solid-Wood Plank Flooring: Blind nail or staple flooring to substrate according to NOFMA's written recommendations.
 - 1. Plank Flooring: For flooring of face width more than 3 inches (75 mm), install not less than two countersunk nails at each end of each piece, spaced not more than 16 inches (406 mm) along length of each piece, in addition to blind nailing. Fill holes with matching wood filler.

3.3 SANDING AND FINISHING

- A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that would be noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.
- B. Apply filler according to manufacturer's written instructions.
 - 1. Fill and repair seams and defects.
- C. Apply stain to match approved Sample if required.
- D. Apply four (4) coats floor sealer/finish according to finish manufacturer's written instructions.

3.4 PROTECTION

- A. Cover installed wood flooring to protect it from damage or deterioration, before and after finishing, during remainder of construction period. Use heavy kraft-paper or other suitable covering. Do not use plastic sheet or film that could cause condensation.
 - 1. Do not cover site-finished floors with kraft paper, or any other material, until finish reaches full cure, but not less than seven days after applying last coat.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1.00 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The "Conditions of the Contract" and "Division 1, General Requirements" form part of this Section.

1.02 SCOPE OF THE WORK

- A. Work included in this Section, without limiting the generality thereof, consists of providing all labor materials, and equipment necessary to complete all resilient flooring work as indicated on the Drawings and called for on the Room Finish Schedule, including but not limited to the following:
1. Vinyl composition floor tile.
 2. Vinyl sheet flooring
 3. Rubber bases, including straight type at carpeting; and coved type for all other locations.
 4. Stair riser, treads and stringers (skirts)
 5. Vinyl reducer strips wherever resilient flooring meets dissimilar flooring except carpeting.
 6. Edge strips, where resilient flooring terminates at exposed concrete floors.
 7. Latex mastic levelling material as required.
 8. Adhesives.
- B. Do all preparation of surfaces to receive materials and perform all cleaning and finishing of materials furnished and installed hereunder.
- C. Related Work Specified Elsewhere:
1. Removal of existing asbestos bearing material: Section 02080
 2. Removal of other existing floor finishes, and patching, repairing, preparation and cleaning of existing surfaces: Section 01040 and Section 01045.
 3. Rough Carpentry: Section 06100

1.03 SUBMITTALS

- A. Submit samples of all vinyl composition tile, and base materials to the Architect for approval before ordering.
- B. Submit manufacturer's recommendations of adhesive for vinyl composition tile.
- C. Submit colors and patterns of all materials. Colors will be selected later by the W.H.A.
- D. Submit maintenance and cleaning instructions and manuals for all resilient flooring materials specified herein.

1.04 QUALITY ASSURANCE

- A. Refer to Section 01600, Products and Installation, for general provisions covering material storage, installation and substitutions.
- B. Before proceeding with complete installation of resilient flooring materials, install a 3 ft. x 3 ft. sample panel of each specified type of flooring over each type of substrate, to test for compatibility of adhesive to substrate and general appearance of finished installation. Do not proceed with complete installation until a minimum of 72 hours after completion of sample panels. Subject to Architect's approval, accepted sample areas may become part of completed work.
- C. Follow manufacturer's instructions for installation.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the project site in original factory wrapping and containers, clearly labeled with identification of manufacturer, brand name, pattern name, quality of grade, fire hazard classification, and lot number.
- B. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, and soiling; laid flat, blocked adequately to prevent sagging and warping.
- C. Deliver materials to site in ample time to avoid delay in job progress and at such time as to permit proper coordination of the various parts.

1.06 GUARANTEE

- A. In addition to the manufacturer's warranty, guarantee the work of this Section against defects of materials or faulty workmanship for a period of one (1) year from date of final acceptance of the building, and repair or replace same during the life of the guarantee without charge.
 - 1. Adjustment: During guarantee period and within 15 days written notice, reset and repair any areas of faulty workmanship.

1.07 JOB CONDITIONS

- A. The resilient flooring installer shall be responsible for inspecting the work of other relating to conditions of the sub-flooring prior to the application of any resilient flooring or customary layout and application of adhesive to the surface.

PART 2.00 – MATERIALS

2.01 VINYL COMPOSITION TILE

- A. Vinyl composition tile shall be a composition of polyvinyl chloride resin, binder, fillers and pigments with colors and texture dispersed uniformly throughout its thickness.
 - 1. The term vinyl resilient tile and vinyl composition tile are synonymous.
 - 2. All tile shall be 12 in. x 12 in. (305 mm x 305 mm), 1/8 in. (3.2 mm) thickness.
 - 3. Vinyl composition tile shall be one of the following, or approved equal:
 - Armstrong Cork Company: "Imperial Modern Excelon"
 - Azrock Floor Products: "Futura"
 - Kentile, Inc.: "Architectural Accents"
 - or approved equal.

- B. Reference Specifications:
ASTM F 1066, Class 2 – through pattern
Fire Test Data:
ASTM E 648 Critical Radiant Flux – 0.45 watts/cm or more,
Class I
ASTM E 662 Smoke – 450 or less
CAN/ULC-S102.2 – M88
Flame Spread 25 or less
Smoke Developed 50 or less
Static load limit: ASTM F970: 125 psi min.
- C. Materials shall be uniform in thickness and size, with edges cut accurately and square, of uniform color, with variations in variegated patterns kept to a minimum. Provide primer, adhesive, cleaners and finishing materials recommended by manufacturer for conditions encountered in field.
- D. Reducing Strips: Solid rubber, 1" x 3/32", tapering to feather-edge, in colors as selected by Architect from manufacturer's standard range.
- E. Edging: 1/8" thick, tapered, 1" wide, solid rubber, in colors selected by Architect from manufacturer's standard range.

2.02 SHEET VINYL

- A. Inlaid Vinyl Sheet Flooring:
1. Description: Inlaid sheet flooring consisting of an embossed wear layer of vinyl chips/granules consolidated on a flexible fibrous backing. Protected by a UV-cured polyurethane finish, the colors and pattern detail are dispersed uniformly throughout the wear layer of the product. Color pigments are insoluble in water and resistant to cleaning agents and light.
 2. Inlaid vinyl sheet flooring shall conform to the requirements of ASTM F1303 Standard Specification for Sheet Vinyl Floor Covering with Backing, Type II, [Grade 1] [Grade 2], with Class A backing
 3. Overall thickness: .08 inches
 4. Manufacturer: Armstrong World Industries; Product: Connections Corlon
 5. Color: As selected from manufacturer's full range of colors.
- B. Vinyl Weld Rod:
1. [Provide [solid color] [patterned] vinyl weld rod as produced by Armstrong World Industries, Inc., and intended for heat welding of seams. Color shall be compatible with field color of flooring or as selected by Architect to contrast with field color of flooring. Color selected from the range currently available from manufacturer.
- C. Seam Adhesive:
1. [Provide Armstrong S-761 Seam Adhesive at seams as recommended by the resilient flooring manufacturer.]

2.03 BASE

- A. All base shall be vinyl as manufactured by Johnsonite, Kentile, Inc., Robbins, Armstrong, or approved equal, 4" high coved, .080" gauge. Type I, straight uncoved type when used in conjunction with carpeting, coved type for all other locations, in colors as

selected, furnished with matching end stops wherever ends of base are exposed to view. External corners shall be pre-formed; internal corners shall be hob-formed. Base shall be provided in continuous lengths from 1 20 foot rolls.

- B. Final selection of colors by Architect.

2.04 STAIR RISERS, TREADS AND STRINGERS

- A. Risers, treads and stringers where scheduled shall be vinyl as manufactured by Johnsonite, Kentile, Inc., Robbins, Armstrong, or approved equal,
B. Risers shall match stair riser height coved, .080" gauge. Final selection of colors by Architect.
C. Stringer shall be 10" high, .080" gauge. Color to match riser.

2.05 ADHESIVES

- A. Water resistant types as recommended by the manufacturer of each material, delivered in sealed containers and used without adulteration. Adhesives: for tile base and accessories shall be type and brand recommended by manufacturer for each of the various conditions and flooring materials. Where manufacturer lists more than one (1) recommended adhesive, the manufacturer's "preferred choice" shall be used. Adhesive for application of base materials shall be specifically recommended for such use. Adhesive for below grade use shall be water-resistant.

2.06 LATEX UNDERLAYMENT

- A. Use to correct any imperfections in flooring beneath tile.
B. Formulations containing only cement and sand are not acceptable.
C. Use one of the following, or approved equal:
- Armstrong "5-105"
- Flintkote "Latex Underlayment"
- Allied "Lev-L-Astic"

2.07 CRACK FILLER

- A. As recommended by flooring manufacturer equal to Armstrong 5-1 90, Flintkote Crack Filler, or Kentile Fast Kenpatch No.1 2 as approved.

2.08 PRIMERS

- A. For use for all the various conditions and materials shall be as recommended by manufacturer of each specific material for each specific application.

2.09 FLOOR CLEANER

- A. Cleaner shall be Armstrong S-485 commercial floor cleaner or Flintkote Floor Cleaner, Hillyard's Super Shine-All, as approved.

2.10 POLISH

- A. Polish shall be manufacturer's approved, non-slip commercial floor finish equal to Armstrong S-480 floor polish, or equal by Flintkote Floor Finish, or Hillyard's Poly-Kote, as approved.

PART 3.00 – INSTALLATION

3.01 WORKMANSHIP

- A. The resilient flooring contractor shall be responsible for inspecting the work of others relating to tolerances and conditions of the existing and new sub-flooring prior to application of any

resilient flooring. He shall immediately notify the Contractor in writing of unsatisfactory surface or assume responsibility for same and rectify any resulting unsatisfactory finish at no additional cost to the Owner.

B. Resilient flooring shall be installed by craftsman skilled in this type of work.

3.02 GENERAL

A. Store materials in original containers at not less than 55 degrees F for not less than 24 hours immediately before installation, in conformance with general provisions of Section 01600, Products and Installation.

B. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 70°F (16°C) and a maximum temperature of 90°F (32°C) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F (13°C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances. Coordinate this requirement with Housing Authority Construction Manager.

C. The Contractor shall test all surfaces for dampness using sub-floor calcium chloride test or other approved manner and no work shall be installed on any base that has not been thoroughly dried out.

D. Approved primer shall be used on concrete surfaces, if so called for by the tile and carpet manufacturer's specifications. Primer shall be allowed to thoroughly dry out before setting tile.

E. Surfaces of concrete floors shall have all minor depressions, gouges, chips, cracks and joints, filled with latex underlayment and protrusions removed.

F. This Contractor shall clean and remove grease and other foreign matter from surfaces to be covered. This Contractor shall be responsible for providing a surface beneath flooring in proper condition to insure complete permanent adhesion and acceptable results.

G. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

3.03 PREPARATION

A. Examine sub-floor for dampness, loose material, excessive irregularity, oily or waxy areas impeding adhesion, or other conditions which would prevent proper installation. Verify that no incompatible curing compound has been used on newly-poured concrete.

B. Allowable variation from level for substrate: 1/4 in. from level in any direction when tested with 10 ft. straight-edge, except as required by unavoidable existing conditions.

C. Levelling sub-floor:

1. Use latex/cement-based levelling compound; Allied Levellastic, C-Cure Latex Underlayment, Selby Levelite-Latex or equal. Formulations containing only cement and sand are not acceptable. Use manufacturer's recommended underlayment for particular combination of substrate and floor material.
 2. Level as required to prevent telegraphing through of substrate irregularities and to achieve specified tolerance for variations from level in finished floor.
 3. Fill cracks greater than 1/16 in. wide and depressions deeper than 1/8 in. Apply levelling compound in thin layers not exceeding 1/8 in., filling up and levelling minor cracks and depressions and providing smooth feather-edged transitions between minor changes of level.
 4. Overall levelling compound thickness shall not exceed 3/8 in.
- D. Broom-clean or vacuum surfaces to receive flooring, before beginning installation.
- E. Apply primer-sealer to substrate, if recommended by flooring or adhesive manufacturer.

3.04 VINYL COMPOSITION TILE

- A. Spread flooring adhesive evenly in strict accordance with recommended specifications of the manufacturer. Apply adhesive only in area which can be covered within recommended working time. Remove any adhesive which dries or films over. Avoid soiling adjacent walls and floors with adhesive. Promptly remove any spillage. Completely embed each tile in adhesive with closely fitted, straight, inconspicuous joints.
- B. Lay resilient material to insure uniform contact with close, even joints, with all finished surfaces smooth and in a true plane, free from buckles, waves or other imperfections.
- C. Carry resilient flooring neatly into breaks and recesses and under kitchen appliances, washing machines and similar heavy equipment. Install reducing strips where flooring does not terminate against a wall, centered under door where occurring at door openings. Cut flooring neatly and accurately to fit snugly against pipes and other vertical surfaces. Seal joints at pipes with adhesive.
- D. Lay tile symmetrically about center lines of rooms, or spaces with not less than 4" wide tile at edges as nearly equal as possible in pattern selected by Architect. Do not cut tile except for edges. Begin laying tiles at center of room, working toward walls.
- E. Finished VCT floor must be smooth and free from buckles, cracks, breaks, waves, and projecting edges and neatly fit at pipes and other projections.
- F. Install vinyl edging or divider strips at edges of flooring where required and where tile meets carpeting. Securely fasten strips to floor below.
1. Edging strips will not be required where adjoining floor finishes are the same level nor where thresholds are required.
 2. Provide divider strips at all changes in floor finish.
- G. Cutting and Fitting: Do all cutting and fitting as required for other installation and leave the whole work in a neat and workmanlike manner. Carefully scribe, cut, and fit to permanent columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.

3.05 CLEANING, WAXING, AND POLISHING VCT

- A. Remove all setting cement, etc. from finished surfaces at once. Clean and buff surfaces as soon as cement has set hard.
- B. Immediately after installation sweep or vacuum thoroughly. Wipe with a dilute neutral detergent solution such as Armstrong S-485 Floor Cleaner and a clean, white, damp cloth – carefully wiping up dirt, scuff marks, black marks and excessive soil. Do not soak with water or other cleaning agent, wet wash or scrub or strip flooring for at least 4-5 days after installation.
- C. Three (3) coats of approved, non-slip wax such as Armstrong S-480 floor polish shall be applied and buffed; no wax containing turpentine, oil, or other solvent that would affect the tile shall be used. Do not soak the tile. All work shall be properly protected until final completion.

3.06 BASE

- A. Vinyl base shall be installed in all spaces designated on the Room Finish Schedule. Wall surfaces presenting an uneven surface shall be carefully smoothed with a butter coat of latex underlayment. Base, corners, and end stops shall be in perfect alignment and shall be thoroughly rolled insuring a full bond. Base shall be installed at all kick spaces and ends of all cabinets.
- B. Cut base to accurate lengths. Minimize number of joints. Maximum joint width: 1/64 in. Neatly score at changes of direction, where pre-molded corners cannot be used. Scribe base accurately to abutting materials. Bond securely to substrate, applying adhesive to wall with notched trowel and pressing base firmly against wall.

3.07 ADJUSTMENTS

- A. This Contractor shall inspect and make necessary adjustments within one (1) month of time that heat is supplied continuously in finished areas. All VCT tiles that have not "seated" in a level plane with surrounding tile shall have heat applied locally and shall be quickly rolled to the surrounding level of floor tile. All tile showing minor breaks and fracture lines entirely across their surface shall be warmed, carefully removed and new tile of the same color and thickness substituted.

3.08 ADDITIONAL MATERIAL

- A. Extra Tile: The Contractor shall supply to the Owner five (5) boxes of extra tile of each manufactured batch of each color used in the work.
- B. Wall base and other accessories: The Contractor shall supply to the Owner at least eighteen (18) lineal feet each type of , in every color used, neatly packaged and clearly labeled.
- C. Supply two copies of manufacturers' maintenance instructions, and three-month supply of recommended cleaning materials.
- D. Obtain signed receipt from the Owner verifying Owner's receipt of extra materials.

END OF SECTION

SECTION 09900

**PAINTING
(Filed Sub-Bid)**

PART 3 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include GENERAL CONDITIONS and applicable parts of Division 1 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.
- D. See Section 06901 - Restoration of Existing Woodwork
- E. Follow recommendations of National Park Service Preservation Brief #10 -Exterior Paint Problems on Historic Woodwork.
- F. Assume existing paint is contains lead. Take suitable precautions to protect workers and prevent spread of paint dust to adjacent properties.
- G. Paint new wood elements with one coat oil-based primer and two coats exterior latex paint.
- H. Paint existing wood elements one coat exterior latex paint. SEE TREATMENT RECOMMENDATIONS
- I. Paint new interior wood trim with one coat latex primer and two coats interior latex paint.
- J. Provide sample on-site to match Architect's color selection.

1.02 FILED SUB-BID REQUIREMENTS

A Bidding procedures shall be in accordance with latest edition of Massachusetts General Laws, Chapter 149, Section 44; and Chapter 30, Section 39M. Time and place for submission of sub-bids is given in Advertisement for Bids.

B Sub-bids for work under this Section shall be for complete work and shall be filed in a sealed envelope with Awarding Authority, at time and place specified in Advertisement for Bids. The following shall appear on face of envelope:

TOWN OF PLYMOUTH
SIMES HOUSE RENOVATIONS
[NAME OF SUB-BIDDER]
SUB-BID FOR SECTION 09900, PAINTING

C Every sub-bid submitted for work under this Section shall be on forms furnished by Awarding Authority, as required by Section 44 of Chapter 149 of General Laws, and specified in Advertisement for Bids.

D Sub-bids filed with Awarding Authority shall be accompanied by bid deposits in form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the Town of Plymouth; in compliance with Chapter 149, Section 44B. Amount of bid deposit shall be as specified in the advertisement for bids.

E Work of this Section is shown on the following drawings: T1, A1.1, A1.2, A1.3, A2.1, A2.2, A3.1, A3.2, A3.3, A4.1, A4.2

F Examine all other Sections of the specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this section.

G Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.03 SCOPE OF THE WORK

A Provide all materials, equipment, labor and services required to do all painting work required for the Work, as indicated on the Drawings, as specified herein, or both. Scope of work under this Section includes field finishing exposed to-view surfaces of all newly installed materials customarily receiving field finish, including (but not necessarily limited to the following:

1. Miscellaneous steel (including galvanized items).
2. Finish carpentry items scheduled for clear or painted finish.
3. Steel and wood doors and frames (including galvanized items)
4. Shop-primed and existing wood windows.
5. Gypsum board and plaster.
6. Paint or stain all existing previously painted or stained surfaces not less than one coat.
7. Spot prime factory-primed and previously painted items as required.
8. Paint all existing exterior and interior surfaces indicated to be painted. See Drawings and Finish Schedule for location of surfaces to be finished where not indicated herein.
9. Paint or seal edges of fixtures, equipment and other material where they present an unfinished appearance.
10. Paint all materials customarily receiving field finish except items indicated to be left unpainted

B Provide not less than one prime coat and two coats of finish paint at all new surfaces except as

otherwise indicated.

- C. Prime all surfaces not factory primed. Properly prepare all new and existing surfaces indicated for finish painting.
- D. Spot prime factory-primed and previously painted items as required.
- E. Apply one coat white oil based primer at raw plaster walls scheduled to receive wallpaper.
- F. Provide all staging, scaffolding and rigging required for this work.
- G. See Drawings and Finish Schedule for location of surfaces to be finished where not indicated herein.
- H. Refinish surfaces of existing construction within rooms where painting is called for on finish schedule and other locations where called for on drawings. Cracks, holes or other defects shall be filled and sanded smooth. Clean, patch and remove loose matter.
- I. Following do not require field finishing, unless otherwise noted on drawings:
 - Factory-finished items, exterior masonry and concrete, sheet metal for roofing and flashing and other items indicated to be left unpainted.
 - Materials and equipment specified with shop-applied or integral finish.
 - Surfaces of finished metals such as anodized aluminum, copper, stainless steel, bronze and chrome.
 - Galvanized sheet steel.
 - Mechanical and electrical equipment; except that equipment (i.e. convector covers, panelboards, piping, conduit and ductwork) mounted in or on painted surfaces, and exposed-to-view equipment mounted on roof or on site, shall be field-painted.
 - Do not paint over any code-required labels, such as UL and FM, or any equipment identification, performance rating, nomenclature plate, etc.
- J. Materials and application shall conform to governmental VOC/VOS regulations in effect at time work is being done.

1.04 RELATED WORK UNDER OTHER SECTIONS

- A. Removal of existing finishes -- SELECTIVE DEMOLITION 02070.
- B. Wallpaper - WALLCOVERING 09950

1.05 SAMPLES AND DATA

- A. Submit samples of all materials specified herein in accordance with requirements of Division 1.
- B. List: Submit paint and coating materials list giving the manufacturer's name, product name and

product number for each material.

C. Data: Submit manufacturer's technical data sheet for each paint and coating, giving descriptive data, curing time, mixing, thinning, and application instructions.

D. Timing: Samples of all colors, stains, and finishes shall be prepared in advance of requirements so as not to delay work, and shall be submitted to the Architect for approval before any work is commenced.

E. Panels: 8" x 10" x 18 gauge metal panels for painted metal surfaces; and 8" x 10" x 1/4" wood panels for painted wood finish.

1.06 COLORS

A. The Architect will furnish a schedule of colors for each area and surface not otherwise indicated. All colors shall be mixed in accordance with the manufacturer's instructions.

B. Colors of priming coats (and body coats where specified) shall be lighter than those of finish coat.

C. Architect will select colors from Moore's Moor-o-Matic Color System. Do not job-mix or tint colors without Architect's approval.

D. Colors shall be pure, non-fading pigments, mildew-proof, sunproof, finely ground in approved medium. Colors used on concrete, masonry, gypsum board, stucco and plaster surfaces (as applicable) shall be limeproof.

E. Provide all facilities for comparison and adjustment of colors; and place final samples for approval directly on the surface to be finished. Machine mixing by the manufacturer's representative will be permitted where advantageous, but only after final approval of colors by the Architect.

F. After final approval of all colors, submit to the Owner color chips of all paints and coatings used, with manufacturer's name and his designation of the paint and color for the purpose of future re-ordering. Color chips shall total at least six (6) square inches for each color.

1.07 STORAGE AND USE OF MATERIALS

A. All materials shall be brought to the building and stored in an approved location in manufacturer's original sealed containers, bearing the manufacturer's standard label, indicating type and color. Materials shall be delivered in sufficient quantities in advance of the time needed in order that work will not be delayed in any way.

B. All materials shall be stored in designated spaces in a manner which meets the requirements of applicable codes and fire regulations. When not in use, such spaces shall be kept locked and inaccessible to those not employed under this Section. Each space shall be provided with a fire extinguisher of carbon dioxide or dry chemical type bearing the label of the National Board of Fire Underwriters and tag of recent inspection.

C. Do not use building sanitary system for mixing or disposal of refuse material. Carry water to mixing rooms and dump waste material in a refuse receptacle. Remove oily rags and waste

each day.

1.08 QUALITY ASSURANCE

- A. Where manufacturer makes more than one grade of any material specified, use the highest grade of each type, whether or not the material is mentioned by trade name in these Specifications.
- B. Include on labels of all containers the manufacturer's name, the product name and number, the color and the batch number.
- C. No claim by the Painting Subcontractor concerning the unsuitability of any material specified or his ability to produce first class work with same will be entertained after Contract is signed.

2.00 MATERIALS

2.01 MANUFACTURERS

- A. Standard paints and finishes used for the project shall be as manufactured by:
1. Benjamin Moore and Co., New York, NY
 2. California Products Corp., Cambridge, MA
 3. Glidden Coatings, Cleveland, OH
 4. PPG Industries, Pittsburgh, PA
 5. Sherwin Williams Co., Cleveland, OH
- B. Manufacturers names used below are to indicate quality and type of materials and not to limit competition.

2.02 COMPATIBILITY OF COATINGS

- A. Ensure that all paints and coatings to be applied in the field are compatible with coatings used for shop-primed items and items which have been primed-coated by other trades. Shop Drawings and manufacturer's data sheets generally indicate types of priming materials used. Such information may be obtained from the Architect upon request.
- B. Determine that the materials specified in the Painting Schedule are compatible with shop coats to which these materials are to be applied, and bring to the Architect's attention any condition which may require a change in the specifications before proceeding with work. Failure to do so shall be construed as acceptance of the coatings specified. Perform all corrective measures, at no additional cost to the Owner, for any defects in work resulting from the use of such materials.
- C. Existing Coatings: Determine by tests, samples or other approved methods that new coatings to be applied are compatible with existing previously applied coatings. Do all preparatory work to prepare previous coatings to receive new work, including spot priming, intercoating, sanding and paint removal to assure permanent adhesion of new coatings to existing work.
- D. Where primer is called for, use primer recommended by manufacturer for particular combination of substrate and finish coat, such as block filler at concrete masonry, latex or PVA at gypsum board. Verify compatibility of primer where painting over existing painted surfaces.
- B. Where painting over shop-applied primers, verify that finish paint proposed for field application is compatible with shop primers actually used.

3.00 EXECUTION

3.01 INSPECTION AND ACCEPTANCE OF SURFACES

- A. Inspect all surfaces to assure that they are in proper condition to receive work under this Section. Do not commence work until all surfaces are in a satisfactory condition.
- B. Assume existing paint is contains lead. Take suitable precautions to protect workers and prevent spread of paint dust to adjacent properties.
- C. If surfaces are not clean, smooth and thoroughly dry or if they cannot be put in proper condition to receive paint, notify the Contractor requesting necessary correction.
- D. See Section 02070 for methods of removing existing finishes.
- E. Commencement of work in any space will be construed as acceptance of the surfaces as being satisfactory. All defects in painting work resulting from such accepted surfaces shall be corrected under this Section at no additional cost to the Owner.

3.02 PROTECTION

- A. Furnish and lay drop cloths in all rooms and areas where painting and finishing is being done to adequately protect flooring and other work from damage during painting work.
- B. Remove canopies of lighting fixtures, electrical switch plates and similar equipment, set them carefully away and cover adequately to protect fixtures. Replace the canopies, plates, and other items, in as good condition as when found after painting is completed.
- C. At completion of work of each area remove all paint spots, oil and stain from all surfaces, including finish hardware. Do not use abrasive paper or abrasive cleaner on hardware or similar finished surfaces.
- D. Perform no work in rain, dew or fog; when the temperature is below 50 degrees F; or before other finish materials have thoroughly dried out.

3.03 PREPARATION

- A. General: Prepare all new and existing surfaces as required to properly receive paint and finish materials. See Section 02070 for methods of removing existing finishes. All surfaces to receive paint shall be smooth and free of sandpaper scratches, mill marks, and other imperfections and, except for coats applied in shop, shall be inspected by the Architect before application of prime and finish coats.
 - 1. Remove blisters and other imperfections in previous coats caused by foreign substances and paint skins from all painted surfaces before the subsequent coat is applied. Wood and metal surfaces shall be rubbed down before finishing and between coats with sandpaper or steel wool, leaving perfectly clean surface. Smooth finished surfaces shall be sanded before finishing and between coats as required to smooth out rough areas and to assure smooth, even finish.

2. Remove all foreign matter which would otherwise prevent adhesion of the applied finishes. Remove all grease and dirt with solvent before applying paint.
3. All knots, pitch streaks and sappy spots in wood shall be touched up with knot sealer before applying first coat. Use orange shellac for dark and white shellac for light painted surfaces.
4. Fill nail holes, cracks, and the like with putty or plastic wood after primer or first coat of finish is dry. On natural finished wood, tint putty to match finished wood.
5. All scratches, cuts, cracks and abrasions in plaster and wallboard surfaces shall be cut out as required, filled with approved patching compound flush with adjoining surfaces and when dry shall be sanded and sealed before application of priming coat.
6. Clean only metal surfaces by wire brushing, power grinding and sanding all mill scale, rust, slag from field welds, loose paint, abraded surfaces of shop coats, grease, oil, dirt and other foreign matter from ferrous surfaces, then properly wash with approved cleaning agent. After cleaning, the surfaces shall be etched, pickled, primed, or otherwise prepared as recommended by the paint manufacturer. Use only rust-inhibiting type primer for ferrous metal priming.
7. Do all required preparatory work to assure permanent adhesion of new coatings to previously coated surfaces as described above.

B. Exterior Surface Conditions Generally Requiring No Paint Removal:

1. To remove dirt, Soot, Pollution, Cobwebs, Insect Cocoons, etc. wash with a strong, direct stream of water from the nozzle of a garden hose. Scrub stubborn dirt and soot off using 1/2 cup of household detergent in a gallon of water with a medium soft bristle brush. Rinse the cleaned surface thoroughly.
2. To remove exterior mildew apply a solution consisting of one cup non-ammoniated detergent, one quart household bleach, and one gallon water. Scrub surface with the solution using a medium soft brush. For particularly stubborn spots, an additional quart of bleach may be added. After the area is mildew-free, rinse with a direct stream of water from the nozzle of a garden hose, and permit to dry thoroughly.
3. To remove excessive chalking clean chalk off with a solution of 1/2 cup household detergent to one gallon water, using a medium soft bristle brush. After scrubbing to remove the chalk, rinse with a direct stream of water from the nozzle of a garden hose and allow to dry thoroughly.
4. Where staining occurs, locate the source of the stain. Remediate rusting of nail heads or oxidizing iron, steel, or copper anchorage devices or other metal objects adjacent to a painted surface by hand sanding object and coating with a rust-inhibitive primer followed by two finish coats. Exposed nail heads should be countersunk, spot primed, and the holes filled with a high quality wood filler. Apply a stainblocking primer such as "Kilz" where discoloration occurs due to knotholes in wood. If stain bleeds through apply additional coats. Each primer coat should be allowed to dry at least 48 hours.

C. Exterior Surface Conditions Generally Requiring Limited Paint Removal (See Section 02070 for

methods of removing existing finishes):

1. Where crazing or surface cracking or wrinkling occurs treat by hand or mechanically sanding the surface to provide as even a surface as possible, before repainting.
2. Where intercoat peeling occurs the peeling top coat should be scraped and hand sanded. Mechanical sanding may be done using an orbital sander only.
3. For blistering caused by moisture, cut blister open. If another layer of paint is visible, then treat for solvent blistering (see below). If bare wood is revealed, then moisture is probably to blame.

D. Exterior Surface Conditions Generally Requiring Total Paint Removal (See Section 02070 for methods of removing existing finishes):

1. Surface conditions are such that the majority of paint will have to be removed prior to repainting include Peeling, Cracking/Alligatoring, Intercoat peeling, Solvent blistering, wrinkling, extensive blistering, and extensively deteriorated paint over large areas.
2. Leave a small sample of intact paint in an inconspicuous area either by covering the area with a metal plate, or by marking the area and identifying it in some way. (When repainting does take place, the sample should not be painted over). This will enable future investigators to have a record of the building's paint history.

3.04 WORKMANSHIP

- A. Materials shall be applied by skilled mechanics under proper supervision. All paint shall be evenly spread and thoroughly brushed out using rollers and paint brushes. Finished surfaces shall be uniform in gloss, finish and color, and shall be free from brush marks.
- B. Apply all materials under adequate illumination and in an atmosphere substantially free of airborne dust.
- C. Before application, materials in containers shall be thoroughly stirred, unless otherwise directed by the manufacturer, to ensure uniformity of color and mass, and all paint skins or other materials which could cause lumps or roughness shall be strained out. Materials shall be applied without the addition of any ingredients and without reducing or thinning.
- D. Painting and finishing shall be carefully done and left perfect. No paint spots shall be left on glass, hardware or other finished work. Do not paint around hardware or removable wall receptacle plates. Such items shall be removed prior to painting.
- E. Workmanship shall be of the very best quality, with all materials evenly spread and smoothly flowed on without runs or sagging. Properly prepare all surfaces before painting to ensure a smooth and uniform surface without variations of gloss, suction or other blemishes.

3.06 APPLICATION

- A. All materials shall be applied in strict accordance with the manufacturer's printed instructions

and in accordance with the best trade practices. Each coat shall be inspected by the Architect before succeeding coat is applied.

- B. No painter's finish shall be applied until the preceding coat is thoroughly dry, and in no case in less than seven (7) days for exterior work and two (2) days for interior work. Where manufacturer's literature indicates a longer drying time, the more stringent requirement shall apply.
- C. Make each coat of paint slightly lighter in color tone than the succeeding coat.
- D. Touch up finish coats of factory finished items that become damaged before completion of the building. Sand damaged areas smooth and apply primer before applying finish coat. Where spot touch up cannot be done neatly and blended smooth with other finish material, repaint entire surface or panel.
- E. All paint shall be applied by brush or roller except as otherwise indicated or specifically approved by the Architect.
- F. Apply coatings only when air and surface temperatures are above 50 degrees F and below 110 degrees F, and with relative humidity below 85 percent. Surface temperature shall be at least 5 degrees above dew point.
- G. Paint surfaces behind movable equipment and furnishings same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only, before final installation of equipment.

3.06 CLEAN UP

- A. Upon completion of work of this Section, remove all paint and coating spatters from glass, prefinished surfaces, bright metals, and from other surfaces that have not been painted or finished under this Section. Remove all painter's materials and debris and leave the surrounding area and the work in a clean condition.
- B. Final Inspection: Protect all painted and finished surfaces against damage until the date of Substantial Completion of the Work. The Architect will inspect all painted work. Painting Subcontractor will be required to repaint, refinish, or retouch any areas which do not comply with the requirements of this Section.
- C. Retouching work required after painted and finished surfaces have been accepted shall be paid for by the Contractor.

3.07 INTERIOR SURFACES

- A. Gypsum Plaster Vertical Surfaces:

First Coat:

Moore Latex Quick Dry Primer Sealer
California Acrylic Enamel Undercoat
Glidden 341 6 Vinyl Primer Tinted
PPG Speedhide Emulsion Sealer

Two Coats:

Moore Regal Aquavelvet
California All-Sheen Acrylic Eggshell
Glidden Spred Latex Satin Enamel
PPG Satinhide Latex Low Lustre Enamel

B. Gypsum Plaster, Overhead Surfaces (Typical):

See above under Gypsum Plaster Vertical Surfaces. Use mildew resistant paint at bathrooms.

C. Wood (except natural finish):

First Coat:

Moore Alkyd Enamel Underbody
California Interior Alkyd Enamel Undercoat
PPG Interior Alkyd Enamel Undercoat

Two Coats:

Moore Alkyd Dulamel
California Alkyd Semi-Gloss Enamel
Glidden Spred Lustre Semi-Gloss Enamel
PPG Satinhide Alkyd Low Lustre Enamel

D. Wood Floors (except natural finish -see Section 09640 Wood Flooring):

First Coat:

Moore Alkyd Enamel Underbody
California Interior Alkyd Enamel Undercoat
PPG Interior Alkyd Enamel Undercoat

Two Coats:

Porch and Floor Enamel by Valspar, Moore, PPG, or California

E. Natural finished hardwood:

one coat alkyd or oil-based wood stain;
one coat bleached shellac
two coats tung oil-based finish (as selected by Architect), satin finish.

F. Shop-primed exposed structural steel, interior and exterior miscellaneous metal:

Two coats alkyd semi-gloss enamel, per FS TT-E-489, dry film thickness 2.0-to-2.5 mils per coat.

Apply paint manufacturer's recommended primer when painting over any of following:

- Steel not provided with shop-primer
- Galvanized or stainless steel
- Aluminum or copper

G. Paint interior steel doors and frames with same color paint specified for interior wood trim surfaces.

3.08 EXTERIOR PAINTING SCHEDULE

A. Ferrous Metal:

First Coat (for galvanized metal only): Exterior galvanized metal primer product of the finish coat manufacturer.

First Coat (for non-galvanized bare metal only): Exterior zinc-rich metal primer product of the finish coat manufacturer.

Two Coats:

Moore Impervo enamel
PPG Quick-dry enamel
California Larcoloid enamel
Glidden Glid-guard Industrial enamel

B. Painted exterior wood:
one coat oil based primer
two coats alkyd house and trim paint, per FS TT-P-91 1.5-to-2.0 dry mils film thickness per coat.

Acceptable products include Devoe All-Weather House Paint, Duron House & Trim Paint, Fuller-O'Brien House & Trim Paint, Glidden Spred Dura, MAB Seashore House Paint, Martin-Senour Great Life, Moore's House Paint, P & L Effecto Enamel, Pittsburgh Sunproof, Sherwin-Williams Gloss House & Trim Paint.

3.10 MAINTENANCE SUPPLY

A. Furnish at least two (2) gallons of each type and color of paint and finish as maintenance supply for future use.

B. Deliver in unopened sealed containers with manufacturer's label indicating contents clearly legible. Store in building in maintenance area where directed.

END OF SECTION

SECTION 10000

MISCELLANEOUS SPECIALTIES

PART 1.00 GENERAL

1.01 GENERAL SCOPE OF WORK

A. General provisions of Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 SUBMITTALS: Issue submittals in accordance with Section 01300, Submittals and Record Documents. Submittals under this Section shall include:

- A. Manufacturers specifications and installation instructions on all specified products.
- B. Color charts and finish samples on factory-finished items.

1.03 QUALITY ASSURANCE: Refer to Section 01600, Products and Installation, for general provisions covering material storage, installation, and substitutions.

PART 2.00 PRODUCTS

2.01 GENERAL

A. Products of particular manufacturers are specified to establish a standard of quality. Similar products by other established manufacturers may be submitted for approval.

B. Unless otherwise noted, Architect will select color and finishes on all items from manufacturer's standard range. If not specified, sizes, locations, mounting details, and quantities of items shall be as shown on drawings.

2.02 ARCHITECTURAL METAL ACCESS PANELS

1. Manufactured by Bar-Co, Inryco/Milcor, Karp, JL, Nystrom, Wilkinson, or Williams, of appropriate type for wall or ceiling material in which doors are being installed.
2. Construction: 16 ga. steel frame and 14 ga. panel, white baked enamel shop primer, sizes as shown on drawings.
3. Mount doors flush with finished surface, on frames with concealed spring hinges which open to 175 degrees, preventing impact with surface. Panels shall be removable by taking pin out or hinge leaf. Locks: flush, screwdriver-operated with cam.
4. Where shown or required, provide fire-rated doors with UL 1-1/2-hour B label, with automatic closing mechanism, construction generally as specified above.
5. All access panels shall be keyed alike.

2.03 MAILBOXES

A. Front-Loading Outdoor Mailboxes: USPS approved Cluster Box Unit (CBU); aluminum with one outgoing mail slot. 360 degree wrapped hinges on all doors. Tenant doors equipped with five-pin cylinder lock cam with dust and rain shield. F-Spec as manufactured by Salsbury Industries or Bommer Industries.

1. Model: Salsbury 3300 Series.
2. Model 3308, Type I: 8 compartments, 1 outgoing mail receptacle, 2 parcel lockers.
3. Cabinet: 0.10 inch (2.5 mm) thick welded aluminum sheet.
4. Doors: Minimum 0.125 inch (3 mm) thick aluminum, with stainless steel hardware and hinges.
5. Locks: 5-pin cylinder cam lock with spring-loaded cover on each unit, 3 keys each lock; USPS-1172 910B lock.
6. Pedestal: Model 3395 for Types I and II; 28.5 inches (724 mm) high. Provide poured in place concrete slab for mounting.
7. Finish: Powder coated.
8. Color: As selected by Architect.
9. Box Identifications: Self-adhesive with black text on silver background; weather resistant.

2.04 WINDOW BLIND

A. Horizontal venetian blinds

1. Blinds shall be Celebrity series by Hunter Douglas with standard cordlock operating system.
2. Slats: Aluminum 1" wide
3. Color: as selected by Architect from manufacturers standard series.

2.05 WHITEBOARD

A. Custom size whiteboard

1. Whiteboard material shall be porcelain enamel on 28 ga. steel on 1/2" hardboard as manufactured by Semper Furniture, West Coast Whiteboards, or Ghent.
2. Size: measure to fit
3. Color: white.

2.06 FIRE EXTINGUISHERS AND CABINETS

A. Acceptable Manufacturers:

1. JL Industries, Inc.(division of Activar Construction Products Group), Larsen Manufacturing Company, or Kidde (division of UTC)
2. Provide fire extinguisher and cabinet from the same manufacturer

B. Extinguishers

1. Multi-Purpose Chemical Type: Extinguisher unit containing a fluidized and siliconized mono ammonium phosphate powder; nonconductive and nontoxic.
2. Construction: Heavy duty steel cylinder with metal valve and siphon tube, O-ring seal, replaceable valve stem seal, visual pressure gage, pull pin and upright squeeze grip.
3. Finish: Factory powder-coated; Red.
4. Effectiveness (Rating): Class A, B, and C fires.
5. Model Identification and UL Rating: JL Cosmic 5E; 3A-40BC or equal
6. Ship extinguishers to the Project site fully charged.

C. Cabinets

1. Trimless Cabinet with Overlapping Door: Embassy Series, Model 5644
2. Cabinet Style: Recessed, trimless with overlapping door.
3. Components:
 - a. Tub: Cold-rolled steel; Finish: Factory-applied powder coat paint finish.
 - b. Standard Color: White.
 - c. Bronze Door Construction: Flush, formed design doors 7/8 inch (22.25 mm) deep, with 2 concealed hinges, and concealed handle with roller catch. V and W door styles feature standard zinc-plated or pull painted to match.
 - d. Bronze Finish: US10/BHMA 612 Satin bronze, clear coated.
 - e. Door Style: Vertical window; with pull.
 - f. Glazing: Type 13: Clear wire glass with safety film.
 - g. Fire-Rating: Fire-Rated for 1-hour.
 - h. Cabinet Lettering: Mounting Direction: Vertical; Type: Diecut lettering; Text: FIRE EXTINGUISHER; Color: Black

3.00 EXECUTION

3.01 INSTALLATION

- A. Examine surfaces and areas to receive specified products. Verify that they are dry, level, properly dimensioned, structurally adequate and otherwise suitable to permit installation.
- B. Verify blocking has been installed properly
- C. Install specified products in accordance with manufacturer's instructions, and protect after installation as required with sheet plastic, kraft paper, etc.
- D. Before Substantial Completion, verify that all equipment is properly functioning, and touch up damaged finishes. Deliver keys and operating and maintenance instructions to Owner.

END OF SECTION

**SECTION 10800
TOILET AND BATH ACCESSORIES**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Attention is directed to the General and Supplementary Conditions and Division I, including all subdivisions thereof, as listed in the Table of Contents, which are made a part of this section.

1.02 DESCRIPTION

A. Furnish labor, materials, equipment and services necessary for the proper and complete installation of all toilet and bath accessories, as shown on the Drawings and as herein specified.

1.03 SEE ALSO THE FOLLOWING SECTIONS

A. SECTION 06100 - ROUGH CARPENTRY, for solid wood blocking at anchorage points of toilet accessories.

B. SECTION 09250 - GYPSUM DRYWALL, regarding coordination of wood blocking requirements at anchorage points of toilet accessories.

C. SECTION 09300 - CERAMIC TILE, regarding coordination of installation of toilet and bath accessories.

D. SECTION 220001- PLUMBING

E. SECTION 260001 - ELECTRICAL, regarding installation of medicine cabinets furnished under this section.

1.04 QUALITY ASSURANCE

A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.

B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

C. Coordinate with requirements of SECTION 06100 - ROUGH CARPENTRY, regarding solid wood blocking for anchorage.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each

toilet accessory.

B. Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices and cut-out requirements in other work.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Approved Manufacturers:

1. Toilet Accessories:

- a. Nutone, Inc.
- b. Basco
- c. Bobrick
- d. Broan
- e. Or equivalent approved by Architect.

B. Provide all accessories from a single manufacturer, in one style and finish.

C. Accessories scheduled are as manufactured by Nutone Inc., or as noted. Equivalent accessories by another manufacturer will be considered for approval by the Architect.

2.02 ACCESSORIES

A. Coordinate with Plans and Room Elevations, on Drawings, for locations of toilet accessories as scheduled. Notify Architect of any significant variation.

B. Provide all toilet accessories in factory finish, as noted herein.

C. Accessories:

Residential Bathrooms 307 and 308:

1. Medicine Cabinet with light: Nutone #1402, top lighted Lafayette with 3-60w incend. lamps, surface mounted medicine cabinet. Modify cabinet to eliminate self-contained switch and electric outlet.
2. Toilet Paper Holder (Surface): Bobrick B685
3. Shower Curtain Rod: Extra-heavy duty shower curtain rod with exposed mounting flanges. Tubing shall be 18 gauge alloy 18-8 stainless steel, 1-1/4 inch OD with satin finish; flanges

shall be 20 gauge satin finish stainless steel countersunk for 3 #10 oval head screws.
Length shall fit full opening; provide ceiling hanger where greater than 72 inches.

4. Lavatory Soap Holder: Bobrick /Gamco 7680
5. Toothbrush holder: Bobrick /Gamco 7679
6. Tub Soap Holder: See section 09300 Ceramic Tile
7. Towel Bar: NuTone HM896-24PC (direct mount). Provide concealed anchors and anchor plates to be built in to stud walls as required.

Public Restrooms 113 and 211:

1. Grab Bars: Bobrick B-6800 series, grab bars with concealed mounting, peened non-slip grip with polished ends, 1-1/2 in. diameter. Sizes and configurations: as shown on drawings.
Provide concealed anchors and anchor plates to be built in to stud walls as required.
 2. Towel Dispenser: Bobrick 3944 recessed paper towel dispenser in satin stainless steel; Unit includes convertible folded paper towel module and 12-gallon waste receptacle module; include 3944-12 vinyl waste liner.
 3. Toilet Paper Dispenser: Bobrick 2888 Classic series semi-recessed toilet paper dispenser in satin stainless steel
 4. Soap Dispenser: Bobrick 2111 Classic series surface mounted satin stainless steel liquid soap dispenser with 40 oz. vertical tank.
5. Baby Changing Station - Surface-Mounted Horizontal Design Baby Changing Station (at Public Restrooms 107 and 113 only):
- a. Basis of Design: Model KB200, color to be selected by Architect, as manufactured by Koala Kare Products, a Division of Bobrick. The design and manufacture shall be compliant with the 2010 ADA Standards for Accessible Design and the 2009 ICC A117.1, Accessible and Usable Buildings and Facilities. Unit shall conform to ASTM F 2285-04 Standard Safety Performance Specification for Diaper Changing Tables for Commercial Use, ANSI Z535.4 Product Safety Signs and Labels, EN 12221:2008, ASTM G22 Antibacterial standards
 - b. Materials. FDA approved injection-molded polypropylene. Unit shall have Microban® antimicrobial embedded into plastic material on the changing surface.
 - c. Operation: Concealed pneumatic cylinder providing controlled, slow opening and closing of the changing station bed.
 - d. Hinge Mechanism: Reinforced full length steel-on-steel hinge.

- e. Changing Surface: Contoured, concave and smooth, 450 sq. in.
- f. Safety Straps: Replaceable, snap-lock, nylon protective holding straps.
- g. Performance: When mounted to specification, unit has been tested to 300 lbs and will deflect less than 1 degree from 90 degrees with a 200 lb static load placed in the center of the changing surface.
- h. Warranty: Unit shall be backed by manufacturer's 5-year limited warranty on materials and workmanship and include a provision for replacement caused by vandalism. Unit shall be manufactured in the U.S.A.
- i. Mounting: Concealed 11 gauge plated steel mounting chassis with 16 inch centers and 6 mounting points the top 2 mounting points feature keyholes for ease of installation units include mounting hardware.
- j. Features: No hinge structure exposed on interior or exterior surfaces; two bag hooks; locking built-in dual cavity liner dispenser with 50 liner capacity supplied with 2 keys that are keyed alike to Bobrick Washroom Accessories.
- k. Instruction Graphics: Universal instruction graphics and safety messages in multiple languages. Optional Braille Label: required.

2.03 FABRICATION

A. General: Only an unobtrusive stamped logo of manufacturer, as approved by Architect, is permitted on exposed face of toilet or bath accessory units. On either interior surface not exposed to view or back surface, provide additional identification by means of either a printed, waterproof label or a stamped nameplate, indicating manufacturer's name and product model number.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install toilet accessories in accordance with manufacturers' instructions, using fasteners which are appropriate to substrate. Install units plumb and level, firmly anchored in locations and at heights indicated.

B. Clean and polish all exposed surfaces after removing temporary labels and protective coatings.

END OF SECTION

SECTION 11452

RESIDENTIAL APPLIANCES

1 GENERAL

1.01 REFERENCES: General provisions of Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to work specified in this Section.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A Kitchen and bathroom cabinets: Section 12390.
- B Plumbing: Division 15.
- C Electrical service: Division 16.

1.03 SUBMITTALS: Issue submittals in accordance with Section 01, Submittals, Shop Drawings, Product Data and Samples. Submittals under this Section shall include:

- A Manufacturers' specifications and installation instructions on all specified appliances, including color charts.
- B Schedule of appliances, using same room designations shown on drawings.
- C Bound set of operating and maintenance instructions for each unit for all appliances provided within that unit, plus a minimum of two complete sets for Owner containing instructions for all equipment within Project.

1.04 QUALITY ASSURANCE

- A Refer to General and Supplementary Conditions for general provisions covering material storage, installation, and substitutions.
- B Equipment shall bear UL labels, and energy guide labels with energy cost analysis (annual operating costs) and efficiency information required by Federal Trade Commission.

2 PRODUCTS

2.01 APPLIANCES

- A. Appliance color: white

Apartment Kitchens 310 and 311:

- B. Electric range: 30 in. slide-in type, GE JSS16PD or equal, including following features:
 - 1. Hinged, recessed, porcelain enamel cooktop; four tilt-lock~plug-in heating elements, two 8 in., two 6 in.; infinitely adjustable controls; removable chrome trim rings and drip pans.
 - 2. Self-cleaning oven equipped with manually-switched light, porcelain oven door with window with safety locking feature, two adjustable chrome racks, and porcelain-enamel broiler/roaster pan with chrome grille insert; control panel with clock, timer, and automatic oven controls; storage drawer below oven; towel bar handle.
 - 3. Approximate cut-out dimensions: 36 in. high, 30 in. wide, 25 in. deep.
 - 4. Acceptable manufacturers: Amana, Frigidaire, General Electric, Hotpoint, Kenmore, Modern Maid, Whirlpool, White-Westinghouse.
- C. Over the Range Microwave Oven: Samsung SMH9187SW or GE PSA9120DFWW; 1.8 cu. ft. capacity with built-in fan and vent to duct.

- D. Refrigerator: side-by-side type, freestanding two-door unit, 19 c.f, GE GSS20DBM or equal, including following features:
1. Capacity of specified unit: total volume: 19.8 cu. ft. Capacity (Fresh Food 12.75 cu. ft. / Freezer 7.04 cu. ft.)
 2. Both compartments frostless, with separate temperature controls; switch for condensation control heating element at freezer opening.
 3. Adjustable shelves, meat compartment, vegetable crisper, butter-conditioning compartment, removable egg trays or bins, door shelves, not less than two ice cube trays.
 4. Adjustable rollers.
 5. Dimensions of specified unit: 66-1/2 in. high, 31-1/2 in. wide, 30-3/4 in. deep.
 6. Acceptable manufacturers: Amana, Frigidaire, General Electric, Hotpoint, Kenmore, Whirlpool, White-Westinghouse.
- E. Dishwasher: GE GDF520PGDWW 24 inch built-in with front controls, gray plastic tub and door liner.

Apartment Laundry Closets 317 and 318:

- F. Unitized Washer and Dryer: GE GUD24ESSJ 24 inch or equal, with 2.0 DOE Cu. Ft. Washer and 4.4 Cu. Ft. Dryer, Rotary-electromechanical controls (dryer), 12 wash cycles, 6 wash/rinse temperatures, 1 wash/spin speed combinations, auto-load sensing, rotary-electronic controls (washer), bleach and fabric softener dispensers, cycle status lights. Acceptable manufacturers: Amana, Frigidaire, General Electric, Hotpoint, Kenmore, Whirlpool, White-Westinghouse.

3 EXECUTION

3.01 INSTALLATION

- A Examine surfaces and areas to receive specified appliances. Verify that they are dry, level, properly dimensioned, and generally suitable to permit installation.
- B Install appliances in accordance with manufacturer's instructions, and protect after installation as required with plastic, kraft paper, etc.
- C Securely anchor built-in equipment to supporting cabinetry or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning, and rough openings are completely concealed.
- D Place free-standing equipment in final locations after finishes have been completed in each area. Verify that clearances are adequate for proper operation of equipment.
- E At job completion, test each appliance item to verify proper operation. Make necessary adjustments. Verify that accessory items required have been furnished. Touch up damaged finishes. Leave units in clean condition, ready for operation. Deliver operating and maintenance manuals to Owner.

END OF SECTION

**SECTION 11900
KITCHEN AND BATH CABINETS**

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Attention is directed to the General and Supplementary Conditions and Division 1 including all sub-divisions thereof as listed in the Table of Contents, which are made a part of this section.

1.02 DESCRIPTION

- A. This section covers casework at Apartment Bathrooms 307 and 308 and Apartment Kitchens 310 and 311.
- B. Furnish labor, materials, equipment and services necessary for proper and complete fabrication of bath cabinets and counters as shown on drawings and as herein specified, including finish hardware and plastic laminate surface.

1.03 SEE ALSO THE FOLLOWING SECTIONS

- A. SECTION 06100 - ROUGH CARPENTRY, regarding stripping, blocking, nailers and rough bases not part of cabinets.
- B. SECTION 06200 - FINISH CARPENTRY, regarding countertops.
- C. SECTION 220001 - PLUMBING, regarding sinks to be installed in kitchen and bath countertops.

1.04 QUALITY ASSURANCE

- A. Cabinetry shall comply with ANSI/KCMI - A 161.1 "Minimum Construction and Performance Standards for Kitchen and Vanity Cabinets", and Paragraph 611-1.1, "HUD Minimum Property Standards - Housing 4910.1" 9/8/86.
- B. Cabinetry shall comply with "severe use" category per Department of Housing and Urban Development - "Minimum Property Standards for Kitchen Cabinets 4910.1" and Section 12370 – RESIDENTIAL CABINETS "HUD GUIDE SPECIFICATIONS FOR PUBLIC AND INDIAN HOUSING" dated September 1993
- C. Plywood shall comply with ANSI/HPMA HP 1983 – Hardwood and Decorative Plywood Standard. All plywood shall have a cross laminated veneer core.

1.05 SUBMITTALS

- B. Shop Drawings:
1. Submit shop drawings in accordance with contract conditions for all cabinets, identified with location, quality grade, type of plastic laminate and finish.

2. Show cabinets in related and dimensional position with sections either full size or 3 inches equal 1 foot scale.
 3. The manufacturer shall be responsible for details and dimension not controlled by job conditions.
 4. Show all required field measurements beyond control of the manufacturer.
 5. Indicate and dimension locations of joints and special patterns.
- C. Submit approved manufacturer's full range of colors of plastic laminate.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle cabinets in manner to prevent damage deterioration.
- B. Defer delivery to the job until the installation and storage areas are complete and dry of all wet-type construction.
- C.
- D. Maintain relative humidity in storage areas not to exceed 60 percent.
- E. Protect all surfaces of cabinets and counter tops subject to damage while in transit.
- F. Provide temporary skids under all large or heavy cabinets.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURER'S:

- A. All new cabinetry shall be manufactured by the following manufacturers:
 1. Armstrong (Triangle Pacific Corp., 25 Crown St., Nashua, NH 03061, (800) 722 0756) "HUD Severe Use" - Traditional style.
 2. Evans Cabinet Corporation, 1321 North Franklin Street, Dublin, GA 31021. Tel. (912) 272-2530, "Public Housing Cabinet, Consolidated Supply"
 3. Mastercraft Cabinets, Inc. division of Elkay
 4. Mid-America Cabinets, Gentry, AK
 5. S&W Cabinets, Inc

or equivalent cabinets by other KCMA certified manufacturers as approved by the Architect.

2.02 CABINETS

- A. Cabinet Construction:
- B. WALL AND BASE CABINET(CONSTRUCTION): Cabinets shall be manufactured using the materials herein specified and shall be provided with wood blocks and braces glued and stapled in place as necessary to assure sturdy rigid construction.

1. Base Cabinets: Constructed of solid lumber and/or exterior grade plywood with wood veneer core. Particleboard, flakeboard, fiberboard, or hardboard not allowed.
 2. Parts Touching Floor: Pressure treated solid lumber. Provide integral toe space of minimum 75 mm (3 inches) by 75 mm (3 inches).
 3. Toe Kicks: 19.1 mm (3/4 inch) net thickness, pressure treated solid lumber.
- C. FACE FRAMES OR STILES: Cabinets shall be constructed with front frame members of sound solid hardwood oak lumber, kiln dried suitable for natural finish and of 3/4" nominal thickness. All frame members shall be mortised and tenoned with joints glued and stapledr pressure, filled and sanded.
1. Vertical End Members(Stiles): Minimum (38 mm) 1-1/2 inch net width.
 2. Vertical Center Members between Doors and Drawers (Mulls): Minimum (50 mm) 2 inches net width.
 3. Horizontal Members (Rails): (44 mm) 1-3/4 inches net width.
 4. Stiles and Top and Bottom Rails: Dadoed to receive ends, bottoms and tops.
- D. END PANELS: All end panels shall be dadoed to receive backs, shelves, bottoms and wall tops. All end panels shall be let into face frame rails.
1. Exposed End Panels: Minimum 2-2 Grade, 12.7 mm (1/2 inch) thick 5-ply exterior hardwood plywood, selected or light uniform color.
 2. Ends Not Exposed : May be 12.7 mm (1/2 Inch exterior softwood plywood, Grade A-D, with Grade A side to inside of cabinet.
 3. Ends: Dadoed minimum 16 mm (1/4 inch) deep to receive shelves, bottoms and tops. Let into dado in face frame.
 4. Base Cabinet End Panels: Stop 89 mm (3-1/2 inches) above floor and supported by 19.1 mm (3/4 inch) by 69 mm (3-1/2 inch) pressure treated solid lumber member.
- E. SHELVES AND BOTTOMS: 1/2" thick 2-2 grade softwood plywood with exterior glue and solid wood banded exposed edges.
- F. BACKS: Cabinet backs of 1/4" softwood plywood shall be attached to minimum size 3/4" x 3-1/2" solid wood hanging rails which shall be mortised to receive back and bottom.
- G. DOORS: Doors of 3/4" oak plywood exterior glue shall have edges shaped to form continuous finger grip that will permit opening of the door with finger tip.
- H. BASE BOTTOMS: Base cabinet bottoms of 1/2" softwood plywood w/ exterior glue shall be let into ends and back rails and shall be supported by 1" x 6" pressure treated lateral braces at 24" o.c. and on ends.
- I. DRAWERS: Drawers shall be constructed as specified. Sides and backs shall be 5/8" solid pine lumber dovetailed into fronts. Back of drawer shall be dadoed into sides, and drawer backs, sides and fronts shall be dadoed to receive drawer bottoms. All drawer bottoms to be 1/4" softwood drawers plywood.on metal side rails with 34 kg (75 pound) loading capacity.
- J. INSTALLATION CLEATS: Minimum 19.1 mm (3/4 inch) by 89 mm (3-1/2 inches) net thickness S4S, Grade C, kiln dried solid lumber, dadoes to receive bottoms and tops. Provide two horizontal members running full length of cabinet at top and bottom.

1. Base Cabinets with Drawers: Side mount drawer slide bracket(s) rigidly attached to 12.7 mm (1/2 inch) thick plywood or wood block which is rigidly attached to top cleat. See "Drawers" paragraph above for alternate mounting.
- K. FINISH: Exposed surfaces and interior of cabinets shall be factory finished consisting of stain, sealer, and varnish coats, lightly sanded between applications.
- L. PULLS: Pulls shall u-shaped brushed stainless steel, 5 inch (128mm) centers

2.03 MISCELLANEOUS ITEMS

- A. Furnish all end skins, toe kick mouldings, fillers, closure pieces, trim, backs, etc. as required for a complete finished installation.
 1. All such items to be exposed to view shall be finished to match cabinetry.

PART 3 - EXECUTION

3.01 FABRICATION

- A. Cabinets shall be fully factory assembled, finished units with all required hardware.
- B. Manufacturer shall use his standard units to whatever extent possible. Minor deviations from the design indicated may be allowed provided there is no change in the concept or quality.
 1. Refer to Drawings for component layout.
- C. Cabinets shall be pre-drilled for screw mounting to walls and to adjacent cabinet boxes.

3.02 CONDITION OF SURFACES

- A. Examine all ground, stripping and blocking to secure cabinets.
- B. Do not install until all defects are corrected.

3.03 INSTALLATION

- A. Install cabinets plumb and level without distortion.
 1. Cabinets shall be screw mounted with fasteners appropriate to type of construction of mounting surface.
- B. Shim as necessary with concealed shims.
- C. Accurately scribe and closely fit all face plates, filler strips and trim strips to irregularities of adjacent surfaces.
- D. Furnish wood blocking requirements to the Contractor in adequate time for inclusion in walls.

3.04 ADJUST AND CLEANING

- A. Upon completion of installation, completely check each installed item and adjust for the proper operation.
- B. All cabinets shall be left in a clean condition both outside and inside with all tags and marks removed from the cabinets and counter tops.

END OF SECTION