PROJECT MANUAL
August 4, 2011

ALTERATIONS TO 130-132 PLEASANT STREET
Portland, Maine

Owner:
Neva Cram & Kerry Drach
136 Pleasant Street
Portland ME 04101
Tel: 207-772-7654

Architect:
Mills Whitaker Architects LLC
PO Box 750089
Arlington MA
Tel: 617-876-7611 / Fax: 617-876-6420

Structural Engineer:
Design/Build basis by the General Contractor

Mechanical Engineer:
Mechanical Systems Engineers, Inc.
Royal River Center, Unit #10
10 Forest Falls Drive
Yarmouth ME 04096
Tel: 207-846-1441 / Fax: 207-846-1443

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Electrical Design Consultants
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A. Before submitting a bid, the Contractor shall make a thorough examination of the conditions at the site, checking the requirements of the Plans and Specifications with the existing conditions.
B. No claim for extra compensation or extension of time will be allowed because of the Contractor's failure to properly estimate the quantities, measurements, locations and site complexities of all items required to complete the work which could be discerned from visiting the site.
C. During the bidding period, the Contractor shall report any discrepancies immediately to the Architect and request a written interpretation. In the absence of any such requests, the Contractor certifies that the conditions at the site are properly represented by the scope of work described by the Plans and Specifications as prepared by the Architect.
D. Asbestos and hazardous materials demolition or removal work is not part of this contract. If any asbestos or asbestos-containing materials are encountered, notify the Architect and Owner immediately and cease work operations in the particular area. The Owner will retain a licensed abatement contractor for the removal of any asbestos encountered during this project.

END OF SECTION

SECTION 00 45 43 – CORPORATE RESOLUTIONS

CERTIFICATE OF VOTE OF AUTHORIZATION

_____20___

I hereby certify that a meeting of the Board of Directors of the:

_____*(Name of Corporation)* duly called and held at

_____ (*City or Town)* on the_____ day of _____ 20____

at which a quorum was present and acting, it was voted that _____

(Name of Corporate Officer) of the _____ *(Name of Corporation)* be and hereby is authorized to execute and deliver for and on behalf of the Corporation a Contract with

_____(*Owner*), for work to be done at _____

in the City/Town of _____, in the state of _____ and to act as Principal to execute Bonds in connection therewith, which Contract and Bonds were presented to and made a part of the records of said meeting.

I further certify that_____ *(Name of Corporate Officer)* is the duly qualified and acting _____ *(Title)* of the Corporation and that said vote had not been repealed, rescinded or amended.

A true copy of the record,

ATTEST:

_____

(CORPORATE SEAL)

SUBSCRIBED AND SWORN TO THIS_____DAY OF_____ BEFORE ME.

_____ My Commission Expires:_____

Notary Public

END OF SECTION

SECTION 00 52 13 - AGREEMENT FORM – STIPULATED SUM

A. The Agreement Form to be used for the Contract shall be AIA Document A101-1997 *Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment is a Stipulated Sum*.
B. The Contractor should be thoroughly familiar with this document prior to submitting a bid.

END OF SECTION

SECTION 00 65 00 – CLOSE OUT FORMS

A. The Affidavit for Payment of Debts and Claims Form to be used for the Contract shall be AIA Document G706-1994 *Affidavit of Payment of Debts and Claims.*

B. The Affidavit of Release of Liens Form to be used for the Contract shall be AIA Document G706A-1994 *Affidavit of Release of Liens.*

C. The Certificate of Substantial Completion Form to be used for the Contract shall be AIA Document G704-2000 *Certificate of Substantial Completion.*

D. The Contractor should be thoroughly familiar with these documents prior to submitting a bid.

END OF SECTION

SECTION 00 72 13 - GENERAL CONDITIONS

A. The General Conditions to be used for the Contract shall be AIA Document A201-1997 *General Conditions of the Contract for Construction*.
B. The Contractor should be familiar with this document prior to submitting a proposed Contract Sum.

END OF SECTION

SECTION 00 73 00 – SUPPLEMENTARY CONDITIONS

The following supplementary conditions modify, delete or add to the AIA Document A201-1997 *General Conditions of the Contract for Construction*. Provisions of the General Conditions not expressly modified or deleted by these Supplementary Conditions shall remain in effect.

ARTICLE 1: GENERAL PROVISIONS

1.1.2 Delete the last sentence in Subparagraph 1.1.2.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS
Add Clause 1.2.1.1 to Subparagraph 1.2.1:

1.2.1.1 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

1. Modifications per Paragraph 1.1.1 of the General Conditions.
2. The Agreement.
3. Addenda, with those of later date having precedence over those of earlier date.
4. The Supplementary Conditions.
5. The General Conditions of the Contract for Construction.
6. Divisions 0 and 1 of the Specifications contained in the Project Manual.
7. The Drawings and Divisions 2 through 28, inclusive, of the Specifications contained in the Project Manual.

In the case of conflicts or discrepancies between the Drawings and Specifications or within either Document not clarified by Addendum, the Architect will determine which takes precedence in accordance with Subparagraph 4.2.11.

1.5.1 EXECUTION OF CONTRACT DOCUMENTS
Delete the last sentence in Subparagraph 1.5.1.

1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
Add the following Subparagraph 1.6.2 to Paragraph 1.6:

1.6.2.1 The Architect may, with the concurrence of the Owner, furnish to the Contractor versions of Instruments of Service in electronic form. Any Instruments of Service furnished in electronic form shall not be considered Contract Documents. The Contract Documents shall be only those identified in Subparagraph 1.1.1.

1.6.2.2 The Contractor shall not transfer or reuse Instruments of Service in electronic or machine-readable form without the written consent of the Architect.

ARTICLE 2: OWNER

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER
Delete Subparagraph 2.2.1. and substitute the following:

2.2.1 The Owner has made financial arrangements necessary to fulfill the Owner's obligations under the Contract. After the commencement of work the Contractor may request in writing that the Owner provide reasonable

evidence of the financial arrangements if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall not be required to furnish such evidence as a condition precedent to commencement of the Work. However the Owner shall furnish, if requested in writing by the Contractor, such evidence as a condition precedent to continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

Delete Subparagraph 2.2.5 and substitute with the following Subparagraph 2.2.5:

2.2.5 The Contractor shall be furnished, free of charge, five (5) copies each of the Drawings and Project Manual. Additional sets will be furnished at the cost of reproduction, postage and handling.

2.2 OWNER'S RIGHT TO STOP THE WORK

2.3.1 Delete the word "persistently" in the second line of Subparagraph 2.3.1.

ARTICLE 3: CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

Add the following Subparagraph 3.2.4:

3.2.4 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for the Architect to evaluate and respond to the Contractor's requests for information, where such information is reasonably available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

3.4 LABOR AND MATERIALS

Delete Subparagraph 3.4.2 and substitute the following:

3.4.2 After the Contract has been executed, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 01 of the Specifications). By making a request for substitutions, the Contractor:

1. represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
2. represents that the Contractor will provide, at a minimum, the same warranty for the substitution that the Contractor would for that specified;
3. certifies that the cost data presented is complete and includes all related costs associated with the substitution except the Architect's redesign costs, and waives all claims for any other costs related to the substitution including, without limitation, those which subsequently become apparent; and

4. will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects without additional compensation.

3.4.4 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect to evaluate the Contractor's proposed substitutions and to make agreed-upon changes in the Drawings and Specifications made necessary by the Owner's acceptance of such substitutions.

3.5 WARRANTY

Add the following new provisions:

3.5.2 The Contractor agrees to deliver and assign to the Owner at the time of final completion any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties.

3.5.3 In all cases in which a manufacturer's name, trade name or other proprietary information is used in connection with materials or articles to be furnished under this Contract, whether or not the phrase "or equal" is used after such name, Contractor shall furnish the product of the named manufacturer(s) without substitution, unless a written request for a substitute has been submitted by the Contractor and approved in writing by the Architect as provided in the Contract Documents.

3.9 SUPERINTENDENT

Add the following Subparagraph:

3.9.2 The Contractor shall not re-assign the superintendent to another project without prior written authorization from the Architect and Owner. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect and other costs incurred by the Owner because of any change in the superintendent initiated by the Contractor without the prior written authorization of the Architect and Owner. The Superintendent shall remain on site until Substantial Completion and for such additional time thereafter as the Owner and Architect may determine is necessary for the expeditious completion of the Work.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Add the following Subparagraph 3.12.11:

3.12.11 The Architect's review of the Contractor's submittals will be limited to examination of the initial submittal and no more than one resubmittal. The Architect's review of additional submittals will be made only with the consent of the Owner after notification by the Architect. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for evaluation of such additional resubmittals.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

Delete Subparagraph 4.1.2 in its entirety.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

Add the following Subparagraph 4.2.2.1:

4.2.2.1 The Contractor shall reimburse the Owner for compensation paid to the Architect for additional site visits made necessary by the fault, neglect, or request of the Contractor. In addition the Contractor shall reimburse the Owner for more than two reviews of each of the Contractor's Applications for Payment.

Delete Subparagraph 4.2.4 and substitute with the following Subparagraph 4.2.4:

4.2.4 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized, the Owner (and any third-party acting as the Owner's Project Representative) and the Contractor shall communicate with each other through the Architect about matters arising out of or relating to the Contract Documents. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors, materials suppliers and the Contractor's design/build consultants shall be through the Contractor; provided, however, that nothing in this provision shall prohibit direct communications by the Owner and/or Architect to Subcontractors, materials suppliers or design/build consultants in the event that there are reasonable grounds to believe that they have not been paid sums due in accordance with the terms of their respective agreements with the Contractor. Communications by and with separate contractors shall be through the Owner or Owner's Project Representative.

4.3 CLAIMS AND DISPUTES

Delete Subparagraph 4.3.10 in its entirety and replace it with the following 4.3.10:

4.3.10 Except as provided below, the Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Subparagraph 4.3.10 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents. Notwithstanding the mutual waiver set forth above, the parties agree that, in the event Final Completion of the Work is delayed more than sixty (60) days from the date of Final Completion, as may be adjusted in accordance with the terms of this Agreement, as a result of a cause or causes for which the Contractor is responsible under the terms of this Agreement or the law, then the Owner, in addition to any other remedies available to it, shall be able to recover actual consequential damages resulting from such delay; *provided, however*, that any consequential damages recovered by Owner for such delay shall be capped at One Hundred Thousand ($100,000) Dollars.

4.4 RESOLUTION OF CLAIMS AND DISPUTES

4.4.6 Delete the first sentence of Subparagraph 4.4.6.

4.5 MEDIATION

4.5.2 Delete Subparagraph 4.5.2 and replace with the following:

The parties shall endeavor to resolve their Claims by mediation. If the parties are unable to agree on a mediation process, it shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect. Request for mediation shall be filed in writing with the other party to the Contract and, if necessary, with the American Arbitration Association. The request may be made concurrently with the filing of a demand for arbitration but, in such event, mediation shall proceed in advance of arbitration or legal or equitable proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

4.6 ARBITRATION

Delete Subparagraphs 4.6.2, 4.6.3 and 4.6.4 and replace with the following:

4.6.2 Claims not resolved by mediation shall be decided by arbitration. If the parties are unable to agree on an arbitration process, it shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect. The demand for arbitration shall be filed in writing with the other party to the Contract and, if necessary, with the American Arbitration Association, and a copy shall be filed with the Architect.

4.6.3 A demand for arbitration shall be made within a reasonable time after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations.

4.6.4 The parties agree that any arbitration proceeding initiated by either of them may be consolidated with any other arbitration then pending or later initiated, so long as the arbitrations involve substantially common issues and the parties have consented to arbitration of disputes. The arbitrator(s) in the earliest-initiated arbitration shall resolve all disputes as to the issue of consolidation. In addition, Contractor agrees, at the Owner's request, to participate in any mediation or arbitration in which Owner and Architect are participants.

ARTICLE 5: SUBCONTRACTORS

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

Add the following Subparagraph 5.4.3:

5.4.3 Each subcontract or the Contractor's design/build consultant agreement shall specifically provide that the Owner shall only be responsible to the Subcontractor or the Contractor's design/build consultant for those obligations of the Contractor that accrue subsequent to the Owner's exercise of any rights under this conditional assignment.

ARTICLE 7: CHANGES IN THE WORK

7.1 GENERAL

Add the following Subparagraph 7.1.4:

7.1.4 The combined overhead and profit included in the total cost to the Owner of the change in the Work shall be based on the following schedule:

1. For the Contractor, for Work performed by the Contractor's own forces, five percent (5%) of the cost. The cost shall include the additional costs of supervision and field office personnel directly attributable to the change.
2. For the Contractor, for Work performed by the Contractor's Subcontractors, ten percent (10%) of the amount due to the Subcontractors.
3. Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.6. This provision shall apply to Contractor and Subcontractor costs.
4. In order to facilitate checking of quotations for extras or credits, proposals shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where cost items are Subcontracts, they shall be itemized also.

ARTICLE 9: PAYMENTS AND COMPLETION

9.3 APPLICATIONS FOR PAYMENT

Add the following sentence to Subparagraph 9.3.1:

The form of Application for Payment, duly notarized, shall be a current authorized edition of AIA Document G702 *Application and Certificate for Payment*, supported by a current authorized edition of AIA Document G703 *Continuation Sheet*.

Add the following Clause 9.3.1.3 to Subparagraph 9.3.1:

9.3.1.3 Until Substantial Completion, the Owner shall pay ninety percent (90%) of the amount due the Contractor on account of progress payments. Retainage shall be paid to Contractor upon Substantial Completion of the Work except that Owner shall retain one hundred and fifty (150%) percent of the value of all punch list items, incomplete and defective or corrective work. The Owner and Contractor agree that, at the time of signing the Owner-Contractor Agreement, that this provision is a reasonable estimate of the probable cost to the Owner of procuring completion of punch list, incomplete and defective or corrective work and that it bears a reasonable relation to the value of such work. The Owner shall pay to the Contractor the sum retained for punch list monthly upon completion of the respective punch list items. This retainage provision shall be incorporated into A101-1997 Section 5.1.8.

Add the following new Subparagraph 9.3.4:

9.3.4 Each Application for Payment shall be accompanied by a Release, Certification, Indemnification, and Partial Waiver of Liens from the Contractor and each of its Subcontractors, including design/build consultants, with subcontracts or purchase orders over $2,500. Each Release, Certification, Indemnification, and Partial Waiver of Liens shall state the amount paid to the Subcontractor. In addition each Release, Certification, Indemnification, and Partial Waiver of Liens shall state that the Subcontractor has been paid all amounts due the Subcontractor on the basis of the previous periodic payment to the Contractor, or, if not, the Release, Certification, Indemnification, and Partial Waiver of Liens shall state the amount not paid and the reason for the discrepancy. In the event of any such discrepancy, the Contractor shall furnish the Contractor's own written explanation to the Owner through the Architect. The Release, Certification, Indemnification,

and Partial Waiver of Liens from the Contractor and each of its Subcontractors and design/build consultants shall be in a form acceptable to the Owner and the Owner's sources of financing, if any.

9.8 SUBSTANTIAL COMPLETION

Add the following Subparagraph 9.8.3.1 and 9.8.3.2:

9.8.3.1 Except with the consent of the Owner, the Architect will perform no more than two (2) inspections to determine whether the Work has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections.

9.8.3.2 As a condition precedent to Substantial Completion, the Contractor shall deliver to Owner all certificates of occupancy and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial occupancy of the Project.

9.10 FINAL COMPLETION AND FINAL PAYMENT

Add the following sentences at the end of Subparagraph 9.10.1 and 9.10.1.1:

9.10.1 All warranties and guarantees required under or pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Architect as part of the final Application for Payment. The final Certificate of Payment will not be issued by the Architect until all warranties and guarantees have been received and accepted by the Owner.

9.10.1.1 Except with the consent of the Owner, the Architect will perform no more than one (1) inspection to determine whether the Work has attained Final Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections.

ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

Add the following Clauses 11.1.2.1 through 11.1.2.5 to Subparagraph 11.1.2:

11.1.2.1 The limits for Worker's Compensation and Employer's Liability insurance shall meet statutory limits mandated by State and Federal Laws. If (1) limits in excess of those required by statute are to be provided or (2) the employer is not statutorily bound to obtain such coverage or (3) additional coverages are requried, additional coverages and limits shall be as follows:

E.L. EACH ACCIDENT	$500,000
E.L. DISEASE – EACH EMPLOYEE	$500,000
E.L. DISEASE – POLICY LIMIT	$500,000

11.1.2.2 The limits for Commercial General Liability insurance including coverage for Premises-Operations, Independent Contractors' Protective, Products-Completed Operations, Contractual Liability, Personal Injuury and Broad Form Property Damage (including coverage for Explosion, Collapse and Underground hazards) shall be as follows:

$1,000,000	Each Occurence
$ 50,000	Damage to Rented Premises (Each Occurence)

$ 5,000	Medical Expense (Any One Person)
$1,000,000	Personal and Advertising Injury
$2,000,000	General Aggregate
$2,000,000	Products-Completed Operations Aggregate
$2,000,000	Underground Explosion Insurance

.1 The policy shall be endorsed to have the General Aggregate apply to this Project only.

.2 The Contractual Liability insurance shall include coverage sufficient to meet the indemnity obligations in the Contract Documents.

.3 Products and Completed Operations insurance shall be maintained for a minimum period of at least two (2) years after either 90 days following Substantial Completion or final payment, whichever is earlier.

.4 The Underground Explosion Insurance shall be maintained by the Contractor for the duration of the contract and work. To the extent excavation work is done by sub-contractors those subcontractors shall also maintain underground explosion insurance. The Contractor shall provide the Architect with copies of all such insurance prior to any excavation work.

11.1.2.3 Automobile Liability insurance (owned, non-owned and hired vehicles) for bodily injury and property damage shall be as follows:

$1,000,000	Each Occurrence

11.1.2.4 Umbrella or Excess Liability coverage shall be as follows:

$3,000,000	Each Occurrence

11.1.2.5 The Architect of Record and Owner shall be named as primary additional insureds under all the Contractor's insurance policies except statutory workers compensation insurance. The Owner’s officers, third-party project representatives, officials, employees, and volunteers are to be added as "additional insureds" as respects liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor, premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Architect or Owner, its third-party representatives, its officers, officials, employees or volunteers. The Contractor shall provide to the Architect and Owner a copy of the insurer’s policy endorsement showing that the the Architect and Owner have been added as additional insured parties under the Contractor’s policies.

Add the following sentence to Subparagraph 11.1.3:

If this insurance is written on a Commercial General Liability policy form, the certificates shall be ACORD 25-S, completed and supplemented in accordance with AIA Document G715, Instruction Sheet and Supplemental Attachment for ACORD Certificate of Insurance 25-S.

Add the following Subparagraph 11.1.4:

11.1.4 The Contractor shall cause each Subcontractor to procure insurance reasonably satisfactory to the Owner.

11.3 PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE

Delete Subparagraph 11.3.1 and add the following Subparagraph 11.3.1:

The Contractor shall purchase and maintain Project Management Protective Liability insurance, from the Contractor's usual sources, as primary coverage for the Owner's, Contractor's and Architect's vicarious liability for construction operations under the Contract. The Contractor shall not be responsible for purchasing any other liability insurance on behalf of the Owner. The minimum limits of liability for such coverage shall be equal to the aggregate limits required for Contractor's liability insurance under Clauses 11.1.2.1 through 11.1.2.5.

11.4 PROPERTY INSURANCE

Insert the following Subparagraph 11.4.1.1

11.4.1.1 The Owner shall maintain its current property insurance and obtain a builder's risk policy, both of which shall be in full effect throughout the performance of the Work. The combined value of these two policies must be greater than the total cost to rebuild the building in the event of a total loss. The Owner shall continue to maintain property insurance on the building after the Work is completed.

In Subparagraph 11.4.7, insert "existing structure on the Project site or the" in the first sentence after "the" and before "Work."

Delete the phrase "as fiduciary" whereever it appears in Subparagraphs 11.4.7, 11.4.8, 11.4.9 and 11.4.10.

11.5 PERFORMANCE BOND AND PAYMENT BOND

Delete Paragraph 11.5 and Subparagraphs 11.5.1 and 11.5.2.

12.2.2 AFTER SUBSTANTIAL COMPLETION

Delete "and to make a claim for breach of warranty" in the third line from the bottom of Subparagraph 12.2.2.

13.7 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

Delete Paragraph 13.7 in its entirety.

14.2 TERMINATION BY THE OWNER FOR CAUSE

Delete the word "persistently" in Subparagraph 14.2.1.1 and 14.2.1.3.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

Delete "along with reasonable overhead and profit on the Work not executed" in Subparagraph 14.4.3.

END OF SECTION

PART B

SPECIFICATIONS

SECTION 01 11 00 - SUMMARY OF WORK

1.01 PROJECT DESCRIPTION

A. The Project Name is “Alterations to 130-132 Pleasant Streer.” All Work is described in the Contract Documents prepared by Mills Whitaker Architects LLC, which consist of Drawings and a Project Manual.
B. The Work under the Contract consists of partial renovation of an existing historic house at 130-132 Pleasant Street in the Spring Street Historic District of Portland.
C. The original building was constructed circa 1804 as a two-story Federal style house one room deep by two rooms wide with a central entrance on the north façade facing Pleasant Street. The house was extensively modified in 1834-1835 when another building was moved to the site from Park (formerly Anne) Street, attached to the rear, and matching Greek Revival entrances were constructed into the east and west facades. An ell that was constructed at various times at the rear of the building (south side) has undergone multiple changes over time.
D. In 1992-1993, the house was converted from a two-family home into a single-family residence and professional offices. The essential elements of the 1834-1835 modifications of the main body of the house remain largely intact to the present day while the extensively modified rear ell is absent of historic fabric.
E. The focus of the current project is to preserve the historic fabric of the exterior and interior while reorganizing the residential and office uses so that the first floor can serve as an accessible single-family home and the second floor can serve as offices.
F. There is no change of use or occupancy associated with the project.

1.02 PROJECT SCHEDULE

A. The Work shall commence upon acceptance by the Owner of the proposed Contract Sum. The Project dates for commencement of construction, Substantial Completion and Final Completion shall be as stated in the Owner-Contractor Agreement.
B. The anticipated date of Substantial Completion shall be March 1, 2012, at which time the building shall be ready for occupancy.
C. The building will be unoccupied from August 8, 2011 through February 29, 2012.
D. The Contractor shall submit a proposed construction schedule and will regularly update the schedule as the project proceeds.

1.03 OTHER INFORMATION

A. Permits: Obtain and pay for any and all permits that may be required to perform the Work except to the extent noted below. Submit copies to the Owner and Architect. Arrange for and pay the cost of any use of the sidewalk and street areas as may be required for succesful completion of the Work.
B. The Owner has applied for and received a Certificate of Appropriateness, without conditions, from the City of Portland Historic Preservation Board. The Owner will provide a copy of this Certificate to the Contractor, along with the relevant application materials that were submitted and reviewed as part of the approval process. The Contractor shall become thoroughly familiar with this document and shall endeavor to abide by its requirements as submitted and as clarified by the Contract Documents.
C. The Owner has submitted Parts 1 and 2 of the Historic Preservation Certification Application and has received approval for the project, with conditions, from the Maine Historic Preservation Commission and the National Park Service. The Owner will provide a copy of these conditional approvals, along with the relevant application materials that were submitted and reviewed as part of the approval process. The Contractor shall become thoroughly familiar with these documents and shall endeavor to abide by its requirements as submitted and as clarified by the Contract Documents.
D. Codes / Inspections / Occupancy: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and

similar communications to the Owner and Architect immediately upon receipt. Upon completion of the project, provide a copy of the Building Permit with all required signatures to the Architect and Owner for their records.

E. Dimensions: Verify dimensions indicated on Drawings with field dimensions before fabrication or ordering of materials. Do not scale Drawings.
F. Existing Conditions: Notify the Architect of existing conditions differing from those indicated on the Drawings. Do not remove or alter structural components without prior written approval.
G. Definitions for terms used in the plans and specifications:
    1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.
    2. Approved: Acceptance of item submitted for approval. Not a limitation of release from compliance with the Contract Documents or regulatory requirements. Refer to limitations of 'Approved' in General and Supplementary Conditions.
    3. Match Existing: As acceptable to the Architect.
H. Intent: Drawings and Specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth but reasonably implied or necessary for proper performance of the project shall be included.
I. Writing style: Drawings and Specifications are written in the imperative mode. Except where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, “Provide” means “Contractor shall provide.”
J. Welding: Minimize the need for field welds by utilizing shop-welded material wherever possible. If field welding is required, Contractor shall notify the Owner and the local authorities in advance. Contractor shall take all necessary precautions and shall provide a constant fire watch during welding operations.
K. Change Orders: Any work that will result in an increase or decrease to the Contract Sum shall be made by Change Order. If work is to result in an increase to the Contract Sum, it must be approved by the Owner and Architect in writing prior to commencement of the work. If any work is begun or completed prior to an expressly stated determination of additional cost and prior to a written authorization to proceed, then that portion of the work will be performed at no additional cost to the Owner.
L. Clean and protect the Work as it proceeds.
M. Employment & Harmony of the Work: The Contractor shall employ personnel who will, at all times, work in harmony with personnel employed by the Owner and other Subcontractors on the Project.
    1. Contracts will be awarded and labor employed without discrimination as to whether the employees of the Owner, the Contractor or any subcontractor are members or non-members of any labor organization.
    2. In the event that the work is stopped or delayed due to the Contractor not having proper or adequate personnel to perform the work, the Owner shall have the right to employ such personnel as are needed to complete the unfinished or contested portion of the Work. A Change Order shall deduct the Owner’s cost of completing that portion of the Work, including a reasonable allowance for supervision and overhead, from the Contract Sum.

END OF SECTION

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, DIVISION 00 – PROCUREMENT & CONTRACTING REQUIREMENTS and PART B, DIVISION 01 – GENERAL REQUIREMENTS, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of Work required.

1.02 RELATED DOCUMENTS

A. Consult the individual sections of the specifications for the specific submittals required under those sections and for further details and descriptions of the requirements.
B. Nothing in this Section shall be interpreted to conflict, in any way, with the terms of the A201 General Conditions and, in particular, Subparagraph 4.2.7, as they relate to the effect of the Architect's review of submittals. In particular, but without limitation, notwithstanding any of the terms hereof, the Architect's review of all submittals shall be for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

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 re-submittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Architect in advance of the Work.
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**: 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, re-submittal), 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 "Approved" 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 “Approved as Noted” 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 Re-submittal**: 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 "OR EQUAL"

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 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. Refer to section 01 60 00 "Product Requirements" for a list of criteria for "or equal" items.

D. The Architect 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 that may be caused by such substitution.

F. **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 45 calendar days prior to the incorporation of the item into the Work. If the time period specified in the Contract Documents from the Notice to Proceed to Substantial Completion is less than 45 days, then the Architect can waive this requirement.
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 that the item is, or is not, considered acceptable as an "or equal" substitution.

1.05 SHOP DRAWINGS

A. Shop Drawings shall be complete, giving all information necessary or requested in the individual section of the specifications. They shall also show adjoining Work and details of connection thereto.

B. Shop Drawings shall be for whole systems. 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 to the Architect one legible, reproducible transparency and five black line prints of each shop drawing. Transparency and prints shall be mailed or delivered in roll form. A transmittal notice shall accompany each submittal. Three copies, including the transparency, will be returned to the Contractor. The Architect will retain one copy, distribute one to the Owner and, when applicable, one to the Architect's Consultant.
F. When the transparency is returned by the Architect with the stamp "Revise and Resubmit" or "Disapproved", the Contractor shall correct the original drawing or prepare a new drawing and resubmit a transparency and at least five 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 "Approved" or "Approved as Noted", the Contractor shall provide and distribute the prints for all Contractor and Subcontractors use in an expeditious manner.
H. The Contractor shall maintain one full set of approved Shop Drawings at the site. The site documents shall be organized and readily available for review by the Contractor, Subcontractors, the Owner and Architect when necessary.

1.06 PRODUCT DATA

A. The Contractor shall submit six 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 a 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 that will not impair legibility.
C. Product Data returned by the Architect as "Revise and Re-submit" or "Disapproved" shall be resubmitted in six copies until the Architects approval is obtained.
D. When the Product Data are acceptable, the Architect will stamp them "Approved" or "Approved as Noted", retain 3 copies, and return 3 copies to the Contractor. The Architect will retain one copy, distribute one to the Owner and, when applicable, one to the Architect's Consultant. 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 Product Data at the site. The site documents shall be organized and readily available for review by the Contractor, Subcontractors, the Owner and Architect when necessary.

1.07 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, more than two samples may be required in order to 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 shall be the actual materials with the actual finishes applied. Color brochures or similar submissions will not be considered as acceptable samples.
E. 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.
F. If the Architect rejects a sample, 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.

1.08 CONSTRUCTION SCHEDULE

A. The Contractor shall prepare and regularly update a detailed schedule for the Work that indicates the starting and ending dates for each activity. The components of the schedule shall be listed in accordance with CSI format and will include sufficient detail of specific project Work items in order to be a useful planning and tracking document for the Contractor, Owner and Architect.

END OF SECTION

SECTION 01 45 23 - TESTING AND INSPECTING SERVICES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to coordinate the Work of this Section, including but not limited to the following:
   1. Concrete testing for basement slab.
   2. Concrete testing for any interior footings or underpinning that may be specified by the General Contractor's Design/Build Structural Engineer.
   3. Concrete testing for deck and ramp foundations.
   4. The Testing Agency shall be selected by and paid by the Owner.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 03 30 00 Cast-in-Place Concrete.

1.04 REFERENCES

A. Concrete testing is to be perfomed in accordance the specific version of the *International Building Code* as authorized by the City of Portland.

PART 2- MATERIALS (N/A)

PART 3 - EXECUTION

3.01 CONCRETE TESTING

A. General
   1. Mix Design Submission: Submit proposed mix design to inspection and testing firm for review prior to commencement of work.
   2. Cement and Aggregates: Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
   3. Test Cylinders: Three concrete test cylinders will be taken for each day's batch.
   4. One additional test cylinder will be taken during cold weather concreting and cured on the job site under the same conditions as the concrete it represents.
   5. One slump test will be taken for each set of test cylinders taken.
B. Delivery tickets: Batch plant shall certify by signing, initialing, or stamping delivery slips that ingredients in truck-load mixes conform to proportions of aggregate weight, cement factor, and water-cement ratio as specified. Review the delivery tickets of the

ready-mix concrete trucks arriving on-site. Notify the Contractor if the concrete cannot be placed within the specified time limits or if the type of concrete delivered is incorrect. Reject any loads that do not comply with the Specification requirements. Rejected loads are to be removed from the site at the Contractor's expense. Any rejected concrete that is placed will be subject to removal.

C. Laboratory tests: Furnish certified compression test reports to the Architect. Each test report shall indicate the following information:
    1. Cylinder identification number and date cast.
    2. Specific location at which test samples were taken.
    3. Type of concrete, slump, and percent air.
    4. Compressive strength of concrete in psi.
    5. Weight of lightweight structural concrete in pounds per cubic foot.
    6. Weather conditions during placing.
    7. Temperature of concrete in each test cylinder when test cylinder was molded.
    8. Maximum and minimum ambient temperature during placing.
    9. Ambient temperature when concrete sample in test cylinder was taken.
    10. Date delivered to laboratory and date tested.

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1- GENERAL

1.01 GENERAL PROVISIONS

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 replacing any temporary facility that is removed prior to Substantial Completion.
B. Removal of all temporary facilities 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 state, federal and local government agencies applicable to Work under this Contract.

1.02 TEMPORARY FACILITIES AND CONTROLS INCLUDED

A. TEMPORARY TOILETS
   1. The Contractor shall provide a secure, temporary toilet on the site for its use during construction.
   2. The toilet shall be kept clean and sanitary at all times.
   3. The temporary toilet location shall be approved by the Owner in advance of its installation. Coordinate the location in deference to any neighborhood concerns.
B. TEMPORARY STRUCTURES AND MATERIAL HANDLING
   1. 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.
   2. The Contractor must obtain the permission of the Owner for the location of any temporary storage facilities on site. The Contractor assumes full responsibility for stored items. Evenly distribute the weight of items stored within the building in order to avoid overloading the capacity of the existing structure.
   3. Protect existing site features for any items stored outside the building.
C. TEMPORARY STAGING, STAIRS, CHUTES
   1. 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. Provide fire-retardant debris netting that is neatly and securely attached to staging.
   2. The Contractor shall furnish, install, maintain in safe condition, and remove any and all temporary ramps, stairs, ladders, and similar items as required for the use of all trades for the proper execution of the Work.
   3. The Contractor shall furnish, install, maintain, and remove covered dumpsters and rubbish containers as may be necessary for the project. Such shall be in locations approved by the Owner and local authorities and permit disposal of rubbish directly into trucks or disposal units provided by the Contractor. The Contractor shall be responsible for the procurement of any sidewalk, street and parking space usage permits and their associated fees.
   4. Debris shall not be allowed to fall freely from the roof and upper levels of the building. Materials shall not be dropped from windows.
D. TEMPORARY WEATHER PROTECTION
   1. The Contractor shall provide temporary protection in the areas of Work as applicable to protect the existing building from weather damage throughout the construction period.

2. Protect the existing building from water infiltration during demolition and construction activities related to the building envelope, including the provision of securely fastened temporary enclosures, temporary tarps, temporary sheathing and watertight temporary drainage as needed.
3. Should high wind warnings be issued by the U.S. Weather Bureau, the Contractor shall take every precaution to minimize danger to persons, to the Work, and to adjacent properties.

E. TEMPORARY HEATING
1. The Contractor shall provide temporary enclosures and heat to permit work to be carried on during the months of October through April to the extent required based on outdoor temperatures and conditions in relation to the type of work being performed. The Contractor shall include the costs of all fuel and electricity required for temporary heating and enclosures, until Substantial Completion, in the Contract Sum.
2. Temporary enclosures and heat shall provide adequate working areas 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 temporary enclosures and heat and shall be responsible for all costs to maintain a minimum of 40 degrees F. at the working surface. This provision does not supersede any specific requirements for methods of construction, application limits for specific materials, curing of materials, or the applicable conditions set forth in the Contract Documents with added regard to performance obligations of the Contractor.
3. The Contractor shall assume the entire responsibility for temporary enclosures and heat during construction until Substantial Completion, and shall be liable for any damage to any Work caused by failure to supply proper enclosures, adequate temperature levels and proper ventilation.
4. The Contractor shall provide a sufficient number of thermostats to monitor air and surface temperatures in the areas of Work.
5. Any constructed element of the building or Work provided under this contract that is damaged by frost shall be removed and replaced by the Contractor at its own expense.
6. The Contractor shall do no Work under any conditions deemed unsuitable by the Contractor for 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.

F. PROJECT SIGN
1. The Contractor will be allowed to place a temporary sign or signs on the property, subject to local approval, to identify the Project, Owner, Architect, Contractor and Subcontractors. The size and location of the sign must be reviewed and approved in advance by the Owner and Architect.
2. The Contractor shall be responsible for securing and paying for any required signage permits as necessary.

G. PARKING
1. The Contractor will be responsible for legally parking in the vicinity of the site.
2. The Contractor shall be responsible for obtaining approvals and permits for their use of the street and sidewalk and for paying all associated fees as necessary.

H. PROTECTION OF PERSONS & PROPERTIES
1. The existing building will not be occupied during construction. The Contractor shall take all necessary precautions to ensure protection of the public and occupants of adjacent buildings and site areas during construction.
2. Any damage to the existing building, any adjacent buildings, sidewalks (brick, concrete and other), roads (public and private), bituminous concrete areas, fences, lawn areas, trees, shrubbery, poles, underground utilities, curbs, etc. shall be made good by and at the Contractor's own expense, all to the satisfaction of the Owner, Architect, abutters and authorities having jurisdiction.

3. In the event that the Contractor damages any property of the Owner, abutters or the like, he shall notify the Owner immediately in writing.
4. The Contractor shall, at no expense to the Owner, patch, repair and/or replace all adjacent materials and surfaces that may become damaged. All repair and replacement Work shall match the existing in kind and in appearance.

I. TEMPORARY PROTECTION
1. The Contractor shall protect the existing building and materials at all times from damage of any origin. Provide all coverings and other materials and equipment as required by job conditions to accomplish this requirement.
2. After the installation of the Work by any Subcontractor is completed, the Contractor shall, unless directed otherwise by the Work of other Sections, 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.

J. TEMPORARY ACCESS PROVISIONS
1. The Contractor shall, at all times, leave an unobstructed way along walks, hallways, and stairways, 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.

K. SECURITY
1. The Contractor shall be responsible for providing all security precautions necessary to protect the Contractor's and Owner's interests.

L. NOISE AND DUST CONTROL
1. The Contractor shall take special measures to protect the neighbors, and general public from noise, dust, and other disturbances by:
   a. Keeping common pedestrian areas clean and unobstructed.
   b. Provide temporary acoustical barriers as needed for limiting sound levels to within the range of allowable maximum levels.
   c. Cooperating with local neighborhood and municipal requirements and regulations in effect regarding noise pollution during construction and respecting the environmental constraints of working at the project site.

M. FIRE PROTECTION
1. 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.
2. Installation of equipment suitable for fire protection shall be done as soon as possible after commencement of the Work.
3. The Contractor shall promptly comply with any and all requirements or directives provided by the local fire department regarding precautions and fire safety.
4. Provide a constant fire watch for any on-site welding activities. The fire watch shall fully comply with the requirements of the local fire department.
5. Smoking in and around the building is prohibited.

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table Of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 MANUFACTURERS

A. Provide products from one manufacturer for each type or kind as applicable. Provide secondary materials as recommended by manufacturers of primary materials.

1.03 SUBSTITUTIONS

A. Provide products selected or approved equal. Products submitted for substitution shall be submitted with acceptable documentation, including costs of substitution and related work.
B. Conditions for substitution include:
    1. An “or approved equal” phrase in the specifications.
    2. Specified material cannot be coordinated with other work.
    3. Specified material is not acceptable to authorities having jurisdiction.
    4. Substantial advantage is offered Owner in terms of cost savings, time, or other valuable consideration.
C. Substitutions shall be submitted prior to the agreement of the Owner and Contractor establishing the final Contract Sum per paragraph 7.6.1 of the Contract for Construction, unless otherwise acceptable. Approval of shop drawings, product data, or samples does not constitute approval of substitution unless clearly presented as a substitution at the time of submittal.

END OF SECTION

SECTION 01 73 29 - CUTTING & PATCHING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Provide cutting and patching work to properly complete the work of the project, complying with requirements for:
   1. Demolition and construction work.
   2. Visual requirements, including detailing and tolerances.
   3. Operational and safety limitations, including fire-resistance ratings.
   4. Inspection, preparation, and performance.

B. Do not cut and patch in a manner that would result in a failure of the work to perform as intended, decreased energy performance, increased maintenance, decreased operational life, or decreased safety.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Match existing materials for cutting and patching work with new materials conforming to project requirements. Provide materials, which are compatible with existing adjacent construction and which match existing textures, colors, tooling and composition.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Inspect project conditions prior to work to identify scope and type of work required. Protect adjacent work.

B. Perform work with workmen skilled in the trades involved.

C. Cutting: Use cutting tools, not chopping tools. Make neat holes. Minimize damage to adjacent work. Check for concealed utilities and structure before cutting. Core drill masonry and concrete surfaces where piping requires passage.

D. Patching: Make patches, seams, and joints durable and inconspicuous. Comply with tolerances for new work. Infill holes where existing devices are removed from surfaces and where piping, conduits, ductwork and the like penetrate walls and floors. Provide fire stopping at penetrations in surfaces that are fire-rated. Seal all penetrations in exterior surfaces so that they are fully weathertight.

E. Protect all surrounding areas from damage from water, dust and debris as a result of cutting and patching work. Clean all areas affected by operations.

END OF SECTION

SECTION 01 74 00 - CLEANING & WASTE MANAGEMENT

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Consult the individual sections of the Specifications for cleaning of Work installed under those Sections.

1.02 WORK INCLUDED

A. CLEANING DURING CONSTRUCTION
   1. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
      a. Do not burn or bury rubbish and waste materials on the site.
      b. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
      c. Do not dispose of wastes into streams or waterways.
   2. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
   3. Do not allow materials and rubbish to drop free or be thrown from upper floors or the roof, but remove by use of a material hoist, rubbish chutes or by removal to a lower level within the building.
   4. Maintain the Site free from accumulations of waste, debris, and rubbish. Provide cleaning throughout the day as needed.
   5. Provide on-site containers for collection of waste materials and rubbish.
   6. At the end of each day, remove from site and legally dispose of all waste materials and rubbish generated as part of the Work under this contract.
   7. Vacuum clean interior building areas that may be affected by the Work on an as-needed basis until Substantial Completion.
   8. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
   9. Disposal of materials shall be in compliance with all applicable laws, ordinances, codes, and by-laws.
   10. Recycle construction demolition and debris in all categories in accordance with regulations and, where not required by law, to the greatest extent possible.

B. FINAL CLEANING
   1. 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.
   2. Unless otherwise specified under other Sections of the Specifications, the Contractor shall perform final cleaning operations as herein specified prior to final inspection.
   3. Cleaning shall include all surfaces, interior and exterior, which the Contractor has had access to, whether new or existing. Cleaning shall also extend to all areas of dust migration as a result of the Work of this contract, including cleaning of adjacent spaces, concealed areas and areas on other floor levels of the building as deemed necessary.
   4. Employ experienced workmen or professional cleaners for final cleaning.
   5. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.
   6. Use cleaning materials which will not create a hazard to health or property and which will not damage surfaces.
   7. All broken or defective glass caused by the Contractor's Work shall be replaced with matching glass at the expense of the Contractor.

8. 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.
9. Clean and polish interior and exterior surface of all windows and doors in the Work area and areas affected by the Work. This cleaning shall be completed by qualified, professional window cleaners hired by and at the expense of the Contractor just prior to acceptance of the Work.
10. Repair, patch, and touch up marred surfaces to the specified finish, to match adjacent surfaces.
11. Leave all architectural metals, hardware, and fixtures in undamaged, polished conditions.
12. In cleaning items with manufacturer's finish or items previously finished by a Subcontractor, care shall be taken to not damage such manufacturer's or Subcontractor's finish. In cleaning glass and finish surfaces, care shall be taken to not 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.
13. Owner's responsibility for cleaning commences at Substantial Completion, except in areas further disrupted by the Work of this Contract or not yet occupiable and useable by the Owner.

C. 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.
D. Clean and polish interior surfaces of all glass throughout the Work. This cleaning shall be completed by qualified, professional window cleaners hired by and at the expense of the Contractor just prior to acceptance of the Work.
E. Repair, patch, and touch up marred surfaces to the specified finish, to match adjacent surfaces.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUBSTANTIAL COMPLETION

A. Prior to requesting the Certificate of Substantial Completion, 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 items to be provided by the Contractor and Subcontractor 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.
C. The Architect shall then conduct a similar review of the work. If the Architect agrees that the Work is Substantially Complete, the Architect will promptly review the work and prepare a punch list, setting forth in detail any items on the Contractor's list and additional items that are unacceptable or incomplete. The Contractor shall coordinate all Subcontractors to achieve prompt completion of the punch list.
D. The Contractor shall not be relieved of the responsibility to provide Contract items left off of the Architect's punch list.
E. 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.
F. When the punch list has been prepared, the Architect will arrange a meeting with the Contractor to identify and explain all punch list items and answer questions on work that must be done before final acceptance.
G. The Architect may revise the punch list, from time to time, to ensure that all items of Work are properly completed.
H. The Architect shall prepare the Certificate of Substantial Completion.

1.02 RECORD DRAWINGS

A. Consult the individual sections of the Specifications for the specific requirements of those sections. In cases of inconsistency the more stringent requirement, as directed by the Architect, shall be applied.
B. Prior to final payment and completion, the Contractor shall provide all marked up As-Built Drawings as required under other sections of the Specifications. If no specific requirements in other Sections are stated, the Contractor shall prepare two sets of As-Built Drawings with notations clearly delineating any changes to the Work due to Addenda, unforeseen conditions, or Change Orders.
C. The Contractor shall submit two blackline copies of the Record Drawings with the date and author of the Record Drawings clearly noted on each sheet. The Architect shall review the Drawings upon submission. If the Record Drawings have been completed to the satisfaction of the Architect, the Architect shall request a set of scanned PDF versions of the Record Drawings to be submitted on two CDs in order to provide electronic supplements to the two hard copies. If the Record Drawings have not been completed to the satisfaction of the Architect, the Architect shall return them to the Contractor with comments for further information as needed.
D. The Contractor shall also markup or revise the Project Manual to make comments reflecting changes during construction. The Record Project Manual shall be dated and marked similarly to the Record Drawings. The submission of two hard copies to the Architect, along with two PDFs on CDs upon acceptance, shall be provided.

1.03 CONTRACTOR AFFIDAVITS

A. Prior to final payment and completion, the Contractor shall submit Affidavits of Payments of Debts and Claims (AIA G706-1994) and Release of Liens (AIA G706A-1994).

1.04 FINAL COMPLETION

A. FULL RELEASE OF RETAINAGE
   1. Upon completion of all Work and after receipt of all appropriate Record Drawings, Record Project Manual, 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.
   3. The Contractor shall provide a final Application for Payment to complement the close-out process.

B. CERTIFICATES OF OCCUPANCY & INSPECTION
   1. Upon completion, apply for and receive Certificates of Occupany and Inspection from the appropriate authorities.

C. PERMIT INFORMATION
   1. Provide copies of all permit applications.
   2. Upon completion of the work, provide copies of permit cards with all authorized signatures indicated.

END OF SECTION

SECTION 02 41 00 - DEMOLITION

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Remove rubble, wood flooring and earth in the basement level to prepare the subsurface for installation of a below grade vapor retarder and concrete slab as specified in other Sections. Existing exposed ledge may remain in place.
   2. Remove existing insulation in the Ell floor, walls and ceilings. Retain existing insulation in the perimeter skirt of the Ell Crawl Space.
   3. Remove portions of exterior walls on the south façade of the Second Floor and the perimeter walls of the Ell where noted for reconfiguration and restoration of exterior window and door openings as indicated on the Drawings.
   4. Remove portions of interior partitions and finishes where noted in the Drawings.
   5. Remove selective interior finishes from floors, partitions and ceilings where noted in the Drawings.
   6. Remove selective interior doors, frames and hardware as indicated in the Drawings. Note that doors and frames to be salvaged and relocated should be removed by the intended installer of the doors and frames in order to insure their integrity and continued servicability in their revised locations.
   7. Remove selective window sash and frames, in limited locations, where noted on the Drawings. The majority of window sash and frames will be restored.
   8. Remove interior trim to the extent indicated on the Drawings.
   9. Remove abandoned masonry chimney in the Ell where it penetrates the First Floor area. Removal of this chimney above the Ell roof was done previously. Retain portion of chimney brickwork in the Ell Crawl Space, below the floor framing, as evidence of this former component of the building.
   10. Remove fixtures, cabinets, appliances and finishes in bathrooms, kitchens and kitchenettes where indicated in the Drawings. Retain existing beadboard wall and ceiling finishes in the Second Floor Bathroom as noted.
   11. Remove exterior wooden fire escape. Remove related interior fire suppression system (sprinklers) that were installed to protect the exit at window locations.
   12. Remove exterior entrance deck and stairs at 130 side door, 130 rear door and 132 rear door. Retain existing entrance deck and stairs at 132 side door.
   13. Remove existing bulkhead doors and areaways for 130 and 132 as indicated.
   14. Selective removal of exterior building envelope items, such as siding, roofing, flashing, etc., shall be performed under their respective Sections.
   15. Remove and store items indicated to be salvaged and re-used. Protect salvaged items from damage during demolition, storage and re-installation.
   16. Remove and legally dispose of all demolished materials off-site.
   17. Recycle construction waste and debris to the extent possible and when required by regulations in order to divert solid wastes from local landfills.
   18. Remove items made redundant by the work. Remove any previously abandoned items encountered in the process of performing the work.

19. Remove all discontinued mechanical and electrical items once those systems are made safe by their respective trades. Remove any previously abandoned mechanical and electrical items where visible.
20. Remove any other items indicated on the Drawings or otherwise required by the Work that are not designated to be removed in other Sections.

B. Salvage and store items listed for salvage by Owner.
C. Remove and donate selected items as noted.
D. In some instances, the Owner may have already removed an item that is indicated on the Drawings to be removed. The Contractor shall be required to remove any related items (piping, wiring, supports, related devices) that still remain and that were not removed completely by the Owner.
E. Asbestos and hazardous materials demolition or removal work is not part of this contract. If any asbestos, asbestos-containing, or other hazardous materials are encountered, notify the Architect and Owner immediately and cease work operations in the particular area. The Owner will retain a licensed abatement contractor for the removal of any asbestos or hazardous materials encountered during this project.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
1. Section 01 50 00 Temporary Facilities and Controls.
2. Section 01 74 00 Cleaning & Waste Management.
3. Section 02 44 00 Shoring, Bracing & Support.
4. Division 06 Wood, Plastics & Composites.
5. Division 07 Thermal & Moisture Protection.
6. Division 08 Openings.
7. Division 09 Finishes.
8. Section 22 00 00 Plumbing.
9. Section 23 00 00 HVAC.
10. Section 26 00 00 Electrical.

1.04 SUBMITTALS

A. Submit certificates attesting to legal disposal of refuse materials.
B. Submit “Demolition Schedule of Items” as listed in this Section.

1.05 QUALITY ASSURANCE

A. Protect portions of the building adjacent to or affected by selective demolition.
B. Remove and legally dispose of all demolished materials off-site.
C. Comply with governing codes and regulations. Use experienced workmen.

1.06 PROTECTION

A. Provide for the uninterrupted safety of workers and occupants as well as adjacent structures during all phases of the work. Provide warning signs and barricades as required to maintain a separated, safe, secure site.
B. Protect all elements that are to remain, including landscaping and site improvements. Do not dismantle anything other than what is specifically indicated on the contract documents unless specifically requested to do so in writing by the Architect.
C. Do not remove any structural elements until finishes have been carefully stripped away and supported elements have been supported by other safe means.

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION

3.01 GENERAL

A. Perform full review of site and building to verify extent of demolition and dismantling and to plan for coordination with other trades.
B. Carefully study each item to be removed and determine the safest, least disturbing and least potentially damaging method of disassembly. Number the items, photograph them and make a sketch of assembled items for re-use during re-assembly. Number each component with an appropriate non-permanent method of marking, and note the points of contact or intersection and their orientation. Photograph all elements to be worked on before and after the work.
C. Prepare a DEMOLITION SCHEDULE OF ITEMS for submittal based on the information contained in the Contract Documents and the review of all field conditions. The schedule shall contain the following categories:
    1. Items to be removed from site by Contractor.
    2. Items to remain in place and protected for reuse.
    3. Items to be salvaged for reinstallation in project.
    4. Items to be salvaged and returned to Owner.
    5. Items to be donated.
D. It is the Contractor's responsibility to request clarification of the intent of the Contract Documents in the event of any ambiguity regarding the removal, salvage or protection of any item that is in question prior to proceeding with the work.
E. Do not damage building elements and improvements indicated to remain. Items of salvage value and not included on schedule of salvage items to be returned to Owner may be removed and become the property of the Contractor. Storage or sale of items at project site is prohibited.
F. Do not proceed with selective demolition until temporary shoring and bracing has been installed where applicable. Cease operations if public safety or existing structures are endangered. Perform temporary corrective measures until operations can be continued properly.
G. Do not proceed with selective demolition until applicable debris netting and temporary dust curtains or partitions have been installed and sealed in order to prevent the migration of dust and debris to adjacent areas.
H. Take all precautions as required by law for the removal and disposal of debris and dispose of in accordance with applicable regulations.
I. Do not close or obstruct streets, walks, drives or other occupied or used spaces or facilities without the written permission of the Owner and authorities having jurisdiction. Do not block any required means of egress at any time during the construction period. Do not interrupt utilities serving occupied facilities without the written permission of the Owner and authorities having jurisdiction.
J. Dismantle and salvage the specific items and store in a safe place for re-assembly.
K. Notify the Architect immediately if any damage has occurred to any of the dismantled and salvaged items and propose appropriate methods of repair.
L. If an item indicated to remain or be salvaged is damaged or destroyed, the Contractor shall provide the missing item or its equivalent, and shall bear any costs.

END OF SECTION

SECTION 02 44 00 - SHORING, BRACING, & SUPPORT

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table Of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Design and installation of all required temporary shoring, bracing and support to enable the necessary restoration and strengthening work to be completed in a safe and expedient manner.
   2. Contractor shall retain and pay for the services of a registered professional engineer familiar with shoring and bracing of historic structures during the construction process. Design drawings shall be stamped by the engineer.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 02 41 00 Demolition.

1.04 SUBMITTALS

A. Submit the following items to the Architect for review and information purposes only. The Architect shall not be responsible for approving the engineer's design for shoring and bracing since that portion of the Work relates to the means and methods of the construction process.
   1. Drawings showing shoring, bracing, and temporary supports for deteriorated and/or invasively disturbed areas.
   2. Drawings showing shoring, bracing, and temporary supports necessary for the Work.
   3. A written sequence of all phases of restoration operations and related temporary support.

1.05 QUALITY ASSURANCE

A. Comply with all referenced standards for the products employed.
B. Schedule all appropriate site visits and inspections with the Structural Engineer of Record for the shoring system.

PART 2 - PRODUCTS

2.01 MATERIALS AND PRODUCTS

A. Use products and materials that are appropriate to each application.

PART 3- EXECUTION

3.01 GENERAL

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. 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.

3.02 FIELD SURVEY & ANALYSIS

A. 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.
B. Perform a structural analysis of the areas to be affected by the work and determine loads on temporary shoring, bracing and support system.

3.03 DESIGN OF SHORING, BRACING, & SUPPORT

A. Shoring, bracing and support shall be designed to maintain existing lines and surfaces without deflection during work. Design shall be in accordance with gravity dead, live and wind load resistance requirements of the *International Building Code.*
B. Design shall be sufficient for existing and new material loads and anticipated construction loads.
C. Design shall allow for distribution of 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 not more than the span lengths divided by 720 at full loading.
D. Minimize use of side grain bearing timbers that may be susceptible to dimensional variations with changes in moisture and temperature. Seal all end grain with endgrain sealer.

3.04 CONSTRUCTION OF SHORING, BRACING, & SUPPORT

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.

3.05 MAINTENANCE OF SHORING, BRACING, & SUPPORT

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.

END OF SECTION

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. The General Contractor shall determine the scope of Work required for this Section with the assistance of a registered professional engineer.
B. The Work of the Section shall be performed on a Design/Build basis.
C. The cost of the Work of this Section, including the cost of the engineer, shall be included in the Contract Sum.

SECTION 04 21 13 – BRICK MASONRY

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. The General Contractor shall determine the scope of Work required for this Section with the assistance of a registered professional engineer.
B. The Work of the Section shall be performed on a Design/Build basis.
C. The cost of the Work of this Section, including the cost of the engineer, shall be included in the Contract Sum.

SECTION 04 43 00 – STONE MASONRY

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. The General Contractor shall determine the scope of Work required for this Section with the assistance of a registered professional engineer.
B. The Work of the Section shall be performed on a Design/Build basis.
C. The cost of the Work of this Section, including the cost of the engineer, shall be included in the Contract Sum.

SECTION 05 12 00 – STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. The General Contractor shall determine the scope of Work required for this Section with the assistance of a registered professional engineer.
B. The Work of the Section shall be performed on a Design/Build basis.
C. The cost of the Work of this Section, including the cost of the engineer, shall be included in the Contract Sum.

SECTION 06 10 00 – ROUGH CARPENTRY

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. The General Contractor shall determine the scope of Work required for this Section with the assistance of a registered professional engineer.
B. The Work of the Section shall be performed on a Design/Build basis.
C. The cost of the Work of this Section, including the cost of the engineer, shall be included in the Contract Sum.

SECTION 06 20 13 - EXTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Exterior deck, stairs, ramp and railings.
B. Refer to Section 07 46 23 Wood Siding and Section 07 27 00 Air Barriers for the following components that are not included in this Section:
   1. Standing and running trim at windows and doors.
   2. Air Infiltration Barrier at selected exterior wall areas.
   3. Exterior Wood Siding at selected wall areas.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 02 41 00 Demolition.
   2. Section 07 27 00 Air Barriers.
   3. Section 07 46 23 Wood Siding.
   4. Section 07 60 00 Sheet Metal Flashing and Trim.
   5. Section 07 92 00 Joint Sealants.
   6. Section 09 90 00 Painting & Coating.
   7. Section 22 00 00 Plumbing.
   8. Section 23 00 00 Mechanical.
   9. Section 26 00 00 Electrical.

1.04 REFERENCES

A. AWPA (American Wood Preservers Association) C1 - All Timber Products - Preservative Treatment by Pressure Process.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Side Entry Deck and Stairs at 130 Pleasant Street: match wood specie (but not profiles and details) at 132 Entry. Refer to details on the Drawings.
B. Accessible Ramp and Kitchen Deck at 130 Pleasant Street: pressure treated framing SYP (concealed); clear white cedar balusters, base rail, fascia and stair risers; clear white cedar skirt lattice; IPE decking, treads and top rail.

PART 3- EXECUTION

3.01 EXECUTION

A. Provide work to sizes, shapes, and profiles indicated on approved shop drawings. Install work to comply with quality standards referenced.
B. Comply with manufacturer's requirements for shipping, delivery, storage on site, cutting, handling and fastening of materials.
C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.
D. Prime all sides of all trim elements prior to installation.
E. Use stainless steel fasteners for all work.
F. Install plumb, level and straight with tight joints. Scribe work to fit adjoining surfaces where applicable.
G. Repair minor damage, clean and protect.

END OF SECTION

SECTION 06 20 23 – INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Provide interior standing and running trim, mouldings, wainscoting, chair rails, window and door casings as noted in the Drawings.
   2. Remove, salvage and reinstall selected interior wood trim as indicated.
   3. Install cabinets furnished under Section 06 41 00 Architectural Wood Casework.
   4. Install solid surface countertops furnished under Section 06 61 16.
   5. Install stone countertops furnished under Section 12 36 40.
   6. Provide vanity base cabinets in Bathroom 102 and bath shelves in 102 and 205.
   7. Install bath accessories furnished under Section 10 28 16.
   8. Provide wood frames for mirrors.
   9. Provide wall mounted handrails and brackets in interior stairways as indicated in the Drawings.
   10. Provide closet rods and closet shelves as indicated in the Drawings.
   11. Other components as indicated on the Drawings or required by the Work.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 02 41 00 Demolition.
   2. Section 06 10 00 Rough Carpentry.
   3. Section 06 41 00 Architectural Wood Casework.
   4. Section 06 61 16 Solid Surface Fabrications.
   5. Section 07 21 00 Thermal Insulation.
   6. Section 08 14 00 Wood Doors.
   7. Section 08 52 00 Wood Windows (Restoration).
   8. Section 08 52 99 Wood Windows and Doors (Pella).
   9. Section 08 80 00 Glass and Glazing.
   10. Section 09 64 00 Wood Flooring.
   11. Section 09 90 00 Painting and Coating.
   12. Section 10 28 16 Bath Accessories.
   13. Section 11 31 13 Residential Kitchen Appliances.
   14. Section 12 36 40 Stone Countertops.

1.04 REFERENCES

A. Architectural Woodwork Institute (AWI) *Architectural Woodwork Quality Standards*, 8th ed., Version 2.0; AWI, 46179 Westlake Drive, Suite 120, Potomac Falls, VA 20165; 571-323-3636; www.awinet.org. Provide premium grade.

1.05 SUBMITTALS

A. Shop Drawings of profiles; samples of materials.

1.06 QUALITY ASSURANCE

A. Quality standard for fabrication and products: AWI *Architectural Woodwork Quality Standards*, Premium grade unless otherwise noted.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Brockway-Smith Co. (Brosco), 146 Dascomb Road Andover, MA 01810-5898; 978-470-0296; www.brosco.com.
B. Anderson McQuaid, 170 Fawcett Street, Cambridge MA 02138; 617-876-3250; http://www.andersonmcquaid.com.
C. Period Furniture Hardware, 123 Charles Street, Boston MA 02114; 617-227-0758; http://www.pfhco.com.
D. Knape & Vogt Manufacturing Co., 2700 Oak Industrial Dr. NE, Grand Rapids, MI 49505; 800-253-1561; http://www.knapeandvogt.com/.

2.02 MATERIALS

A. Door and window trim: painted poplar; dimensions and profiles as shown on the drawings.
B. Wall trim: painted poplar; dimensions and profiles as shown on drawings.
C. Beadboard: As specified under Section 06 42 00 Wood Paneling.
D. Handrail brackets shall be Ives 59MB, solid brass with matching screws, US 10B.
E. Closets:
    1. Closet shelves: Painted birch plywood edge-banded; dimensions and profiles as shown on the Drawings.
    2. Hanging rods: Knape & Vogt 770 5 Heavy Duty Round Tubing, 1-5/16” O.D., 0.109” wall thickness, chrome-look finish.
    3. Hanging rod brackets: Knape & Vogt 776 Flanges for 1-5/16” O.D. round tubing.
    4. Adjustable shelf standards: Knape & Vogt 85 series, 1 1/14” x 1/2”, white.
    5. Adjustable shelf brackets: Knape & Vogt 185 series, white; shelf screws to match finish and to stabilize shelving.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that rough framing and substrates are plumb, true, and square before commencement of installation.
B. Review scope of selective removal, salvage and reinstallation that will be required and plan the work before proceeding.
C. Mark wood elements that will be removed so that they can be reinstalled in their original locations to the extent practical.

3.02 INSTALLATION

A. Remove existing wood elements with care to preserve their integrity without splitting, gouging or otherwise damaging the wood.
B. Provide work to sizes, shapes, and profiles indicated on approved shop drawings. Install work to comply with quality standards referenced.

C. Comply with manufacturer's requirements for shipping, delivery, storage on site, cutting, handling and fastening of materials.
D. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.
E. Back prime concealed surfaces of interior work that will abut masonry, concrete or exterior surfaces. Use non-corrosive fasteners for all work.
F. Install plumb, level and straight with tight joints. Scribe work to fit adjoining surfaces where applicable.
G. Repair minor damage, clean and protect.

END OF SECTION

SECTION 06 41 00 - ARCHITECTURAL WOOD CASEWORK

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Kitchen and Den Casework
      a. Cabinets at Kitchen 115.
      b. Cabinets at Den 116.
B. Other casework (e.g., Passage 202) shall be provided under Section 06 20 23 Interior Finish Carpentry.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 02 41 00 Demolition.
   2. Section 06 20 23 Interior Finish Carpentry.
   3. Section 07 92 00 Joint Sealants.
   4. Section 09 26 13 Gypsum Veneer Plaster.
   5. Section 09 30 00 Tiling.
   6. Section 09 64 00 Wood Flooring.
   7. Section 09 90 00 Painting and Coating.
   8. Section 11 31 13 Residential Kitchen Appliances.
   9. Section 12 36 40 Stone Countertops.
   10. Section 22 00 00 Plumbing.
   11. Section 23 00 00 Mechanical.
   12. Section 26 00 00 Electrical.

1.04 REFERENCES

A. AWI Architectural Woodwork Quality Standards, Premium grade.

1.05 SUBMITTALS

A. Materials order.
B. Shop drawings.
C. Samples of wood and finishes.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets to project site until the areas in which they are to be installed are ready to receive them.
B. Store cabinets indoors prior to installation. Take care to protect cabinets from direct sunlight.
C. Handle cabinets carefully to prevent damage to finished surfaces.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Crown Point Cabinetry, Mark Wirta – Project Manager, 462 River Rd., Claremont, NH 03743; 800-999-4994; www.crown-point.com.

2.02 CASEWORK MATERIALS

A. Cabinet work at Kitchen and Den: Crown Point
   1. Door style: Barnstead flat panel doors, flat drawer fronts.
   2. Construction: Maple wood,1" square inset frame.
   3. Paint color: Classic Paint in standard color to be selected.
   4. Knobs: DE-19-FB.
   5. Pulls: DE-18-FB.
   6. Pantry Pull-Out: Hafele full extension pantry frame, 330-lb. capacity, steel, chrome/white Arena Plus tray set.
   7. Washer/Dryer Door Pocket: Hafele HAWA turnaway pivot sliding door fitting with bi-fold door supplement.

PART 3- EXECUTION

3.01 EXAMINATION

A. Examine walls, floor surfaces, and electrical, gas, and plumbing rough-ins to verify that they are ready to receive cabinets.
B. Verify that blocking is in place where required for wall-hung cabinets.
C. Proceed with installation only after any unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Follow manufacturer's instructions. Installation shall be provided under the Work of Section 06 20 21 Interior Finish Carpentry.
B. Cabinets and shelving shall not be installed until the wood and ceramic tile flooring have been installed. Furthermore, the first coat of wood floor finish must be provided and approved by the Architect prior to installation of the cabinets. Refer to wood floor finish in Section 09 64 00 Wood Flooring.

END OF SECTION

SECTION 06 42 00 - WOOD PANELING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Wood-paneled walls at Half Bath 108.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include but are not limited to the following: Section 06 10 00 - Rough Carpentry
   1. Section 06 10 00 Rough Carpentry.
   2. Section 06 20 23 Interior Finish Carpentry.
   3. Section 09 26 13 Gypsum Veneer Plaster.
   4. Section 09 90 00 Painting & Coating.
   5. Section 10 28 16 Bath Accessories.
   6. Section 22 00 00 Plumbing.
   7. Section 26 00 00 Electrical.

1.04 SUBMITTALS

A. Manufacturer’s data sheets.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products indoors in manufacturer's unopened packaging until ready for installation.
B. Protect work from moisture damage.

1.06 ENVIRONMENTAL CONDITIONS

A. Maintain relative humidity between 25 and 55 percent prior to beginning installation.
B. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Nantucket Beadboard Co., 109 Chestnut Hill Rd., Rochester, NH 03866; 501-679-4175; www.beadboard.com.

1. Nantucket Beadboard Co. MRI premium grade moisture resistant interior fiberboard type; 1/2”-thick x 48” wide x length required to eliminate butt joints between sheets; 3” center-to-center standard bead pattern.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Verify adequacy of backing and support framing.
D. Verify that mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Condition panel prior to fabrication and installation by placing them in the room to be paneled, with spacers between each piece to allow for air circulation. Allow 48 to 72 hours for material to acclimate to the humidity and temperature of the room in which it applied.
C. Install three rows (top, middle and bottom) of horizontal blocking in the areas to receive the beadboard. Provide vertical blocking behind seams that don’t otherwise fall on the vertical joints between panels.
D. Beadboard is to be installed at the walls as indicated on the Drawings, directly over studs and blocking in same plane as veneer plaster at upper wall.
E. Run material parallel to the studs glue and nail accordingly. (Note: Horizontal joints, unless otherwise concealed by trim, are not allowed.)
F. Start installation at corner. Space to avoid having to install very narrow pieces. Dry-fit the first panel, making any tapered or angled cuts necessary so that the leading edge is left plumb and level, with seams over studs or installed blocking.
G. Set and secure materials and components in place, square and true.
H. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch.
I. Apply several beads of construction adhesive to the face of studs and blocking. Press the panel onto the wall use a hammer and a padded wood block to tap the panel into position.
J. Pull the panel away from the wall and hold it for about 30 seconds, then press the panel back into position and secure with block and hammer.
K. Apply adhesives in accordance with adhesive manufacturer’s instructions. Secure panels as necessary with finish nails. Test on samples to determine if it will be necessary to pre-drill holes for finish nailing.
L. Allow for electrical outlets and piping penetrations.
M. Use of a thin bead of paint-grade caulk at each joint to help achieve a seamless look. Clean each joint before proceeding to the next panel.
N. Countersink exposed fasteners below the surface and cover with putty or wood patching compound and sand flush. Caulk all gaps and joints with painters caulk.

END OF SECTION

SECTION 06 61 16 - SOLID SURFACING FABRICATIONS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Countertop and backsplash at Bathroom 202.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 06 20 23 Interior Finish Carpentry.
   2. Section 06 41 00 Architectural Wood Casework.
   3. Section 22 00 00 Plumbing.
   4. Section 23 00 00 Mechanical.
   5. Section 26 00 00 Electrical.

1.04 SUBMITTALS

A. Shop drawings showing the location of each item, dimensioned plans and elevations, and large-scale details. The drawings should show:
   1. Edge details, thermoforming requirements, attachments, etc.
   2. Locations and sizes of furring and blocking, including concealed blocking and reinforcement specified in other sections.
   3. Locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in the countertop.
B. Samples:
   1. Provide actual material samples for color selection.
C. Certifications:
   1. Submit manufacturer’s signed certificate for each type of product.
   2. Submit fabricator/installer qualifications, with certification number.
D. Maintenance materials:
   1. Submit manufacturer’s care and maintenance data, including repair and cleaning instructions.
   2. Include a maintenance kit for finishes in the project closeout materials.

1.05 QUALITY ASSURANCE

A. Work of this Section shall be by an experienced, certified fabricator/installer, certified in writing by the manufacturer.
B. Conduct a conference at the project site prior to installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver countertop to project site until base cabinet is ready to receive it.

B. Store countertop indoors prior to installation.
C. Handle materials carefully to prevent damage to finished surfaces, and cover the finished work to prevent physical damage or staining following installation for the duration of project.

1.07 WARRANTY

A. Provide manufacturer's warranty against defects in materials.
   1. Warranty shall provide material and labor to repair or replace defective materials.
   2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.
   3. Warranty shall be transferable to subsequent owner for remainder of warranty period.
B. Optional Installed Warranty:
   1. To qualify for the optional Installed Warranty, fabrication and installation must be performed by a DuPont Certified Fabrication/Installation source that will provide a brand plate for the application.
   2. This warranty covers all fabrication and installation performed by the certified/approved source subject to the specific wording contained in the Installed Warranty Card.
C. Manufacturer's warranty period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. DuPont; 800-441-7515

2.02 MATERIALS

A. Bath countertop: DuPont Corian 1/2" thick, front face built up to 1" thick with pencil edge treatment; color and sheen to be selected by Architect.
B. Back splashes and side splashes at Bath countertop: 1/2" Coved back splash and side splashes to be cemented into routed groove in countertop; color and sheen to match countertop; heights as noted on the Drawings.

2.03 ACCESSORIES

A. Joint adhesive: Manufacturer's standard one- or two-part adhesive to make inconspicuous, nonporous joints.
B. Sealant: Manufacturer's standard milder-resistant, FDA-compliant, UL-listed silicone sealant, color to match countertop material.
C. Sink mounting hardware: Manufacturer's standard

2.04 FACTORY FABRICATION

A. Shop-fabricate components to the greatest extent practical to the sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
B. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints. Reinforce with strip of solid polymer material, 2" wide.
C. Provide factory cutouts for sinks, and fittings as indicated on the drawings.
D. Rout and finish component edges with clean, sharp returns.
   1. Rout cutouts, radii, and contours to template.
   2. Smooth edges.
   3. Repair or reject defective and inaccurate work.
E. Outside edges of countertops to be 1" thick with pencil edges.

F. Edges of undermount sink cutout to be 1” thick with pencil edges.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
   1. Provide product in the largest pieces available.
   2. Form field joints using manufacturer’s recommended adhesive, with joints inconspicuous in finished work.
   3. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.
   4. Cut and finish component edges with clean, sharp returns.
   5. Rout radii and contours to template.
   6. Anchor securely to base cabinet or other supports.
   7. Carefully dress joints smooth, remove surface scratches and clean entire surface.
B. Coved backsplash and side splashes:
   1. Provide coved backsplash and side splashes at all walls and adjacent millwork.
   2. Fabricate radius cove at intersection of counter with backsplash to dimensions shown on the drawings.
   3. Adhere to countertop using manufacturer’s standard color-matched Joint Adhesive.

END OF SECTION

SECTION 07 11 13 – BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Bituminous dampproofing and protection board at concrete bulkhead and infilled areas of stone masonry below grade.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 03 30 00 Cast-In-Place Concrete.
   2. Section 04 43 00 Stone Masonry.
   3. Section 07 92 00 Joint Sealants.

1.04 SUBM ITTALS

A. Product Data: Submit product data, including manufacturer's specifications, installation instructions, and general recommendations for dampproofing applications. Also include manufacturer's certification or other data substantiating that the submitted products comply with requirements of Contract Documents.
B. Test Reports: Submit for acceptance, complete test reports from approved independent testing laboratories certifying that dampproofing system conforms to performance characteristics and testing requirements specified herein.

1.05 QUALITY ASSURANCE

A. The following standards and publications are applicable: Comply with governing codes and regulations.
B. Manufacturer: Provide products of manufacturer with no less than 10 years experience in manufacturing the bituminous dampproofing materials for the required work. Manufacturers that cannot provide the performance test data specified herein will not be considered for the project.
C. Applicator: Dampproofing applicator shall be experienced in the installation of bituminous dampproofing materials as demonstrated by previous successful installations, and shall be approved by the manufacturer in writing.
D. Pre-Installation Conference: Prior to installation of dampproofing, conduct meeting with dampproofing applicator, installers of work adjacent to or which penetrates dampproofing, Architect, Owner’s Representative, and dampproofing manufacturer's representative to verify and review the following:
   1. Project requirements for dampproofing as set out in Contract Documents.
   2. Manufacturer's product data including application instructions.

3. Substrate conditions, and procedures for substrate preparation and dampproofing installation.
4. Requirements for waterstop installation within concrete joint work to be provided by others.

E. Technical Consultation: The dampproofing manufacturer's representative shall provide technical consultation on dampproofing application.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.
B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.07 PROJECT CONDITIONS

A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.
B. Proceed with installation only when substrate construction and preparation work is complete and in condition to receive dampproofing.

1.08 WARRANTY

A. Manufacturer's Warranty: Manufacturer shall provide standard product warranty executed by authorized company official. Term of warranty shall be ten (10) years from the date of Substantial Completion of the overall project.
B. Applicator's Warranty: Applicator shall warrant the dampproofing installation against defects caused by faulty workmanship or materials for a period of two (2) years from the date of Substantial Completion of the overall project. The warranty will cover the surfaces treated and will bind the applicator to repair, at his expense, any and all leaks through the treated surfaces which are not due to structural weaknesses or other causes beyond applicator's control such as fire, earthquake, tornado and hurricane. The warranty shall read as follows:
C. Warranty: The applicator warrants that, upon completion of the work, surfaces treated with bituminous dampproofing will be and will remain free from water dampness resulting from defective workmanship or materials for a period of two (2) years from the date of Substantial Completion of the overall project. In the event that water dampness occurs within the warranty period from such causes, the applicator shall, at his sole expense, repair, replace or otherwise correct such defective workmanship or materials. Applicator shall not be liable for consequential damages and applicator's liability shall be limited to repair, replacement or correcting of defective workmanship or materials. Applicator shall have no responsibility with respect to water dampness or other defects caused by structural failure or movement of the structure, or any other causes beyond Applicator's control.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Bituminous Dampproofing: Trowel grade fibered emulsion mastic (ASTM D1227, Type II, Class I); (ASTM D1187, Type I), trowel applied, vapor-permeable, asphalt emulsion dampproofing containing no asbestos; Karnak 920AF Fibered Emulsion Mastic or approved equal.
B. Acceptable Manufacturer: The Karnak Corporation, 330 Central Avenue, Clark, NJ 07066; 800-526-4236; www.karnakcorp.com

C. Source Quality: Obtain bituminous dampproofing products from a single manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Site Visit: Prior to dampproofing installation, arrange visit to project site with dampproofing manufacturer's representative. Representative shall inspect and provide written certification that the concrete surfaces are in acceptable condition to receive dampproofing treatment.
B. Verification of Substrates: Verify that concrete surfaces are sound and clean, and that form release agents and materials used to cure the concrete are compatible with dampproofing treatment. Examine substrate; report unsatisfactory conditions in writing. Beginning work means acceptance of substrate.
C. Examination for Defects: Examine surfaces to be dampproofed for form tie holes and structural defects such as honeycombing, rock pockets, faulty construction joints and cracks. Such defects to be repaired in accordance to manufacturer's product data and 3.02 below.
D. Begin work only after substrate construction and penetrating work, if any, has been successfully completed.

3.02 PREPARATION

A. Surface Preparation: Smooth surfaces (e.g. where steel forms are used) or surfaces covered with excess form oil or other contaminants shall be washed, lightly sand-blasted, water-blasted, or acid etched with muriatic acid as necessary to provide a clean absorbent surface. Surfaces to be acid-etched shall be saturated with water prior to application of acid.
B. Repair of Defects: Surface defects shall be repaired:
    1. Form Tie Holes, Construction Joints, Cracks: Chip out defective areas in a "U" shaped slot one inch (25 mm) wide and a minimum of one inch (25 mm) deep. Clean slot of debris and dust. Soak area with water and remove excess surface water. Fill holes with non-shrink grout.
    2. Rock Pockets, Honeycombing or Other Defective Concrete: Rout out defective areas to sound concrete. Remove loose materials and saturate with water. Fill cavity to surface level with non-shrink grout.
C. Wetting Concrete: Prior to application of dampproofing treatment, saturate concrete surfaces with clean water as recommended by the manufacturer. Remove free surface water before application. Surface of concrete should be damp.
D. Do not apply when rain is imminent. Protect from freezing. Coating must be dried before exposure to water. Store in a heated room and keep container covered when not in use. Do not thin. Keep out of reach of children. Avoid prolonged contact with skin. Dispose of in an environmentally safe manner.

3.03 INSTALLATION

A. Comply with manufacturer's instructions and recommendations including restrictions on existing and forecasted weather conditions. Install cant strips, asphalt felt reinforcing strips and other accessories as recommended by dampproofing manufacturer.
B. Clean and prepare substrate; prime if recommended by dampproofing manufacturer. Protect adjacent work and surfaces from spillage, migration, and damage.
C. Apply two coats of bituminous dampproofing at a rate of 2 to 3 gallons per 100 sq. ft. per coat. Allow the first coat to dry prior to the application of the second coat.

D. Provide protection board on all foundation walls and other surfaces subject to backfilling.
E. Equipment may be cleaned with water immediately after use. Dried coating may be cleaned with mineral spirits.

END OF SECTION

SECTION 07 21 00 – THERMAL INSULATION

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not necessarily limited to the following:
   1. Unfaced batt insulation.
   2. Fire-retardant vapor barrier.
   3. Rigid board insulation.
   4. Sound attenuation fire blankets.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition.
   2. Section 06 10 00 Rough Carpentry.
   3. Section 06 20 23 Interior Finish Carpentry.
   4. Section 09 26 13 Gypsum Veneer Plaster.

1.04 SUBMITTALS

A. Submit to Architect for approval complete product data for all work of this SECTION. Data shall consist of product description, specifications, MSDS data sheets, thermal resistance, STC data, water vapor transmission and fire resistance information.

1.05 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
B. Provide materials which do not contain asbestos formaldehyde or other known toxins that contribute toward poor indoor air quality. Confirm compatibility of materials with all substrate conditions. Review field conditions and proposed installation with local authorities having jurisdiction prior to installation.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Unfaced batt insulation: Formaldahyde-free unfaced glass fiber blanket insulation in maximum thickness possible based on existing joist and rafter cavity dimensions;

Flame Spread 25 or less; Smoke Developed 50 or less; manufactured by Johns Manville or approved equal.

1. At north exterior wall stud cavities in central rooms on first and second floor: Bathroom 102 and Passage 202 where indicated on the Drawings.
2. At all exterior walls and the ceiling of the Ell: Kitchen 115 and Den 116.
3. At south, east and west exterior walls of the southern portion of the second floor: Waiting 208 and SW Office 211.
4. At east, west and south walls of Attic: 301, 302 and 303.
5. Depth of cavity and insulation thickness shall be determined in the field after selective demolition exposes the stud and joist depth available.

B. Vapor barrier: 6 mil clear fire-retardant, reinforced polyethylene sheet over fiberglass insulation areas.

C. Rigid board insulation: square-edge extruded polystyrene board with 5.0 R-value per inch; water vapor transmission of less than 1.0 perms; Green Guard Insulation Board by Pactiv Building Products or equal.

1. 4” thickness at floor joists of Ell in Crawl Space.
2. 4” thickness at rafters of Attic in 301, 302 and 303.

D. Sound attenuation fire blanket insulation: non-combustible mineral-fiber composition with high sound attenuation characteristics sized one-inch wider than stud spacing for tight fit within void space; Flame Spread 0; Smoke Developed 0; "Creased" SAFB as manufactured by Thermafiber, Inc.; density 2.5 PCF.

1. At demising partitions between 102 and adjacent rooms 101 and 103.
2. At demising partitions between 202 and adjacent rooms 201 and 204.
3. If ceilings of the first floor require removal for structural reinforcement and repair, provide SAFB in the joist space to provide acoustical separation between floors.

PART 3– EXECUTION

3.01 INSTALLATION

A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.

B. Except as noted otherwise, provide full thickness of insulation in one layer over entire area, tightly fitting around perimeter and any penetrations.

C. At walls, provide vapor barrier on the inside face of the studs. The sheet must cover the entire height of the wall, including the top and bottom plates. Fasten at a maximum of 16" o.c. to top and bottom plates, around all framing openings and at lap joints between sheets. Laps must be vertical only and occur at studs; overlap sheets by a full stud spacing and seal the joint with aluminized tape over the stud. Cut tight to penetrating junction boxes and seal with aluminized tape. Windows and doors should be covered and then cut undersize to allow the sheet to be folded over at the time of finishing.

D. At roofs and ceilings, provide vapor on the inside face of rafters and ceiling joists. The sheet must cover the entire surface between heated and unheated spaces. Fasten at a maximum of 16" o.c. Joints between sheets at the roof and ceilings should be horizontal, "reverse shingled" to drain any moisture to the eaves. Seal joints with aluminized tape.

E. Do not allow installation of interior wall finishes or other enclosing materials on open side of construction until observation of the installated condition of insulation products has been performed by the Architect.

F. Remove and dispose of excess insulation, wrappings and other waste materials.

G. Protect installed insulation and vapor barrier.

END OF SECTION

SECTION 07 26 16 - BELOW-GRADE VAPOR RETARDERS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Vapor retarder under interior concrete footings and slabs on grade.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following
   1. Section 02 41 00 – Demolition
   2. Section 03 30 00 - Cast-in-Place Concrete

1.04 SUBMITTALS

A. Materials specifications, sample and manufacturer's data sheets.

1.05 REFERENCES

A. Class A, ASTM E 1745 Standard Specification for Water Vapor Retarders Used in Contact With Soil or Granular Fill Under Concrete Slabs.
B. ASTM E 96 - Water Vapor Transmission of Materials.
C. ASTM E 1643 - Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Equal or better than products manufactured by: Reef Industries, Inc., PO Box 750250, Houston, TX 77275; 800-231-6074; www.reefindustries.com.

2.02 MATERIALS

A. Vapor retarder under concrete footings & slabs: Reef Industries Griffolyn Type 65 G.
   1. Material: 3-ply laminate combining 2 layers of high-density polyethylene and a high-strength non-woven cord grid with a layer of non-woven geotextile fiber.
   2. Weight: ASTM D 3776: 76 lb/1,000 ft^2 (37.1 kg/100 m^2).
   3. Puncture Propagation Tear Resistance: ASTM D 2582: 56 LBF (249 N).
   4. Permeance: ASTM E 96: 0.038 grains/hr-ft^2-in Hg (2.125 ng/(Pa-s-m^2)).
   5. Dart Impact Strength: ASTM D 1709: 4.85 LBS (2200 g).
   6. 3" Tensile Strength: ASTM D 882: 190 LBF (845 N).

7. Puncture Strength: ASTM D 4833: 102 lb (450 N).
8. Classification: ASTM E 1745, Class A.
9. Usable Temperature Range: -25 to 170 degrees F (-32 to 77 degrees C).

2.03 ACCESSORIES

A. Seam and repair tapes for vapor retarders under slabs:
   1. Mastic Tape: Griffolyn Fab Tape.
   2. Self-Adhesive Repair Tape: Griffolyn Griff-Tape.
B. Pipe Boots: Griffolyn pipe boots, field-fabricated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive reinforced vapor retarders. Notify Architect if areas are not acceptable. Do not begin installation until unacceptable conditions have been corrected.
B. Expose and clean edges of existing vapor barriers under adjacent portions of slabs and/or footings adjacent to areas of Work in order to ensure effective splices and seams for the provision of continuity in the vapor retarder system.

3.02 INSTALLATION

A. Install reinforced vapor retarders in accordance with ASTM E 1643 and manufacturer's instructions.
B. Install vapor retarders continuously at locations under footings and patched portions of slab as indicated on the drawings. Ensure there are no discontinuities in the vapor retarder at seams and penetrations.
C. Install vapor retarders in largest practical widths.
D. Ensure subgrade beneath vapor retarder is smooth, level, and compacted with no sharp projections.
E. Join sections of vapor retarder and seal penetrations in vapor retarder with mastic tape. Ensure vapor retarder surfaces to receive mastic tape are clean and dry.
F. Ensure there is no moisture entrapment by vapor retarder due to rainfall or ground water intrusion.
G. Immediately repair holes in vapor retarder with self-adhesive repair tape.
H. Seal around pipes and other penetrations in vapor retarder with pipe boots in accordance with manufacturer's instructions.

3.03 PROTECTION

A. Protect reinforced vapor retarders from damage during installation of reinforcing steel and utilities and during placement of concrete slab.
B. Immediately repair damaged vapor retarder in accordance with manufacturer's instructions.

END OF SECTION

SECTION 07 27 00 – AIR BARRIERS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Complete air infiltration barrier at exterior frame walls in areas where existing siding, trim, windows and doors are to be replaced or removed and reinstalled.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 06 10 00 Rough Carpentry.
   2. Section 07 46 23 Wood Siding.
   3. Section 07 92 00 Joint Sealants.
   4. Section 08 52 99 Wood Windows and Doors (Pella).

PART 2- PRODUCTS

2.01 MATERIALS

A. Air infiltration barrier: Dupont Tyvek HomeWrap
B. Seam tape: Dupont Contractor Tape

2.02 MANUFACTURER

A. Dupont, PO Box 80728, Wilmington, DE 19880; 800-448-9835; tyvekinf@usa.dupont.com.

2.03 SUBSTITUTIONS

A. Substitute products, in particular Typar, will not be accepted.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are suitable to accept work as outlined in this section.
B. Prior to commencing the work, report to the Architect, in writing, any defects in surfaces or conditions which may adversely affect the performance of products installed under this section.

C. Commencement of work outlined in this section shall be deemed as acceptance of existing work and conditions.

3.02 EXECUTION

A. Apply air barrier to wall sheathing according to manufacturer's instructions. Include strips of barrier material at the sill plate and header. Tape all seams.

3.03 PROTECTION

Take care to avoid damaging the air barrier before it is covered by finish materials. Before installing siding, carefully inspect the air barrier and make any necessary repairs with seam tape.

END OF SECTION

SECTION 07 31 13 – ASPHALT SHINGLES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, DIVISION 00 – PROCUREMENT & CONTRACTING REQUIREMENTS and PART B, DIVISION 01 – GENERAL REQUIREMENTS, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Granular-surfaced asphalt shingle roofing.
   2. Self-adhering underlayment for eave, rake and slope transition protection.
   3. Roofing felt underlayment for general slope protection.
   4. Roofing Cement.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition.
   2. Section 07 53 23 EPDM Membrane Roofing.
   3. Section 07 60 00 Sheet Metal Flashing and Trim.

1.04 REFERENCES

A. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
B. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
C. ASTM D 1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
D. ASTM D 3018 - Standard Specification for Class A Shingles Surfaced with Mineral Granules.
E. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
F. ASTM D 3462 - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
G. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
H. ASTM D 4869 - Standard Specification for Asphalt-Saturated Organic Felt Shingle Underlayment Used in Roofing.
I. ASTM D 6757 – Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products.
J. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
K. ASTM E 108 – Standard Test Methods for Fire Test of Roof Coverings.
L. ASTM G 21 – Determining Resistance of Synthetic Polymers to Fungi.

M. Asphalt Roofing Manufacturers Association (ARMA).
N. National Roofing Contractors Association (NRCA).

1.05 SUBMITTALS

A. Submit under provisions of Section 01 33 00 Submittals.
B. Product Data: Provide manufacturer's printed product information indicating material characteristics, performance criteria, and product limitations.
C. Manufacturer's Installation Instructions: Provide published instructions that indicate preparation required and installation procedures.
D. Certificate of Compliance: Provide Certificate of Compliance from an independent laboratory indicating that the asphalt fiber glass shingles made in normal production meet or exceed the requirements of the following:
    1. ASTM E 108/UL 790 Class A Fire Resistance.
    2. ASTM D 3161/UL 997 Type I Wind Resistance.
    3. ASTM D 3462.
    4. Shop Drawings: Indicate specially configured metal flashing, jointing methods and locations, fastening methods and locations, and installation details, as required by project conditions indicated.
E. Submit actual samples of shingles for each color option. Samples shall be submitted in sufficient quantity to indicate full range of color variation within each color choice.

1.06 QUALITY ASSURANCE

A. Maintain one copy of manufacturer's application instructions on project site.
B. Verify that manufacturer's label contains reference to specified ASTM standards.
C. Installer must be approved by the respective manufacturer for installation of all roofing products to be installed under this Section.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Take special care when applying shingle underlayment and shingles when ambient or wind chill temperature is below 45 degrees F (7 degrees C). Tack self-adhering underlayment in place if it does not adhere immediately to the deck.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
B. Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in direct sunlight.
C. Store bundles on a flat surface. Maximum stacking height shall not exceed manufacturer’s recommendations. Store all rolls on end.
D. Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.

1.09 EXTRA MATERIALS

A. Provide uncut shingles of opened and remaining containers purchased for the project to the Owner upon completion of the shingle work. Stack remnants neatly in a location on site as directed.
B. In addition to open containers, provide a minimum two (2) unopened bundles of shingles. Store on site where directed by Owner.

1.10 WARRANTY

A. Manufacturer's Warranty: Furnish shingle manufacturer's warranty for product(s) of this section as follows:
   1. 30-year limited warranty.
B. Warranty Supplement: Provide manufacturer's supplemental warranty to cover labor and materials in the event of a material defect for the following period after completion of application of shingles:
   1. First five years.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Provide products manufactured by the following manufacturer:
   1. CertainTeed Corporation, P.O. Box 860, Valley Forge, PA 19482.
      Tel: (800) 233-8990; Website: http://www.certainteed.com/.
B. Substitutions: allowed if product meets or exceeds specification.

2.02 ASPHALT FIBER GLASS SHINGLES

A. CertainTeed XT 30: Conforming to ASTM D 3018 Type I - Self-Sealing; UL Certification of ASTM D 3462; UL 2218 Impact Resistance Rating, Class 4; ASTM D 3161/UL 997; 80-mph Wind Resistance warranty upgrade; and UL Class A Fire Resistance.
   1. Weight: 240 pounds per square (100 square feet)
   2. Color: As selected by the Architect from manufacturer's full range.
   3. Standard Warranty: 30 Years.
   4. Steep slope, high wind installation: six nails, six spots of roofing cement per shingle.

2.03 SHINGLE UNDERLAYMENT

A. Self-Adhering Underlayment: Sheet barrier of self-adhering high temperature asphalt shingle underlayment, having internal reinforcement, and "split" back plastic release film. End and side laps to meet manufacturers' installation instructions. Use only materials compatible with EPDM and copper. Use the following product or a substitute that meets or exceeds specification:
   1. Grace ULTRA by Grace Construction Products.
B. Roofing Felt Underlayment: ASTM D 4869, asphalt saturated felt for use in areas where self-adhering underlayment is not to be used.

2.04 SHEET METAL AND FLASHING MATERIALS

A. Refer to Section 07 60 00 Sheet Metal Flashing and Trim, for special conditions.

2.05 ACCESSORIES

A. Nails: Standard round wire type roofing nails, corrosion resistant; hot dipped zinc coated steel, aluminum, or chromated steel; minimum 3/8 inch (9.5 mm) head diameter; minimum 11 or 12 gage (2.5 mm) shank diameter; shank to be of sufficient length to penetrate through roof sheathing or 3/4 inch (19 mm) into solid wood, plywood, or non-veneer wood decking.
B. Asphalt Roofing Cement: ASTM D 4586, Type I or II.
C. Accessory Shingles: ridge shingles and starter strips.
D. Provide 1/2” exterior grade AC plywood screwed to existing renailed sheathing.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing site conditions under provisions of Section 00 31 19.
B. Verify roof penetrations and plumbing stacks are in place and flashed to deck surface.
C. Verify proper installation of sheet metal and EPDM membrane prior to installing work of this Section.
D. Verify deck surfaces are dry and free of ridges, warps, or voids.

3.02 ROOF DECK PREPARATION

A. Existing roofing shall be removed down to the roof deck per Section 02 41 00. Existing asphalt shingles shall be recycled.
B. Existing sheathing shall be renailed as indicated on the Drawings.
C. Follow shingle manufacturer's recommendations for preparation of roof deck materials.
D. Broom clean deck surfaces under eave protection and underlayment prior to their application.
E. Verify that the deck is structurally sound and free of deteriorated decking. Notify the Architect if any deteriorated decking is uncovered after removal of existing roofing.
F. Verify that the deck is dry, sound, clean and smooth. It shall be free of any depressions, waves or projections. Cover with sheet metal, all holes over 1 inch (25 mm) in width, loose knots and excessively resinous areas.
G. Fill knotholes and cracks with latex filler at areas to receive self-adhering membrane.

3.03 INSTALLATION - UNDERLAYMENT

A. Place eave drip edge at all eaves except as noted otherwise on the Drawings. Weather-lap joints 2 inches (50 mm) minimum and seal as noted in Section 07 60 00 Sheet Metal Flashings and Trim. Secure flange with nails spaced 8 inches (200 mm) on center.
B. Refer to Section 07 53 23 EPDM Membrane Roofing for low slope roofing. Refer to Section 07 62 00 Sheet Metal and Flashing for copper work.
C. Apply Self-Adhering Underlayment at eave, rake and slope transition area as indicated on the Drawings and in accordance with manufacturer's instructions. Provide at roof hoods, vent piping and any other roofing penetrations.
D. Apply Roofing Felt Underlayment as general protection in accordance with manufacturer's instructions. Apply perpendicular to slope in all areas where self-adhering underlayment is not installed. Lap self-adhering membrane by 4" minimum. Lap roll ends by 6" minimum, Overlap subsequent sheets of roofing felt underlayment in shingle fashion by half roll width plus 2" for double-layer coverage.
E. NOTE: Architect will NOTapprove the use of self-adhering underlayment over entire roof surface.

3.04 INSTALLATION – ASPHALT SHINGLES

A. Install shingles in accordance with manufacturer's instructions for product type and application specified.
B. Minimize breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C). Handle carefully in hot weather to avoid scuffing the surfacing, or damaging the shingle edges.
C. Placement and Nailing:
    1. Secure with number of nails required per shingle per manufacturer’s instructions and to meet specified wind resistance ratings.

2. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details and refer to product requirements as indicated in this Section.
3. Provide spots of roofing cement when specified by the manufacturer for the roof slope and where noted in this Section for upgrading wind uplift resistance.
4. Nails must be driven flush with the shingle surface. Do not overdrive or underdrive the nails. Staples may be used only at proper penetration settings to avoid shingle damage and with adequate penetration (3/4" minimum) into solid wood substrate.
5. Follow steep-slope, high-wind installation requirements for shingles on all roof slopes.
6. Provide shingle offset based on application instructions for the specified shingle.

D. Penetrations: All Penetrations are to be flashed according to ARMA and NRCA application instructions and construction details.

3.05 FIELD QUALITY CONTROL

A. Visual inspection of the Work will be provided by Architect. If conditions are unacceptable, Architect will notify the Contractor.

3.06 PROTECTION OF FINISHED WORK

A. Protect finished work.
B. Any roof areas that are not completed by the end of the workday are to be protected from moisture, water penetration and contaminants.
C. Do not permit foot traffic over finished roof surface.

END OF SECTION

SECTION 07 46 23 - WOOD SIDING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Removal of existing beveled wood clapboard siding and/or provision of replacement siding where indicated on the Drawings.
   2. Salvage and reinstallation of existing beveled wood siding in areas of exterior wall structural repair (not where replacement of siding is required).
   3. Provision of flashed white cedar setting blocks for wall mounted MEP devices, such as, electrical outlets, vents, sill cocks, meters, light fixtures, wall vent for blower hood, dryer vent and telephone network interface device.
   4. Exterior white cedar trim in profiles and dimensions on the Drawings.
   5. Air infiltration barrier as described in Section 07 27 00 Air Barriers.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition.
   2. Section 06 10 00 Rough Carpentry.
   3. Section 06 20 13 Exterior Finish Carpentry.
   4. Section 07 27 00 Air Barriers.
   5. Section 07 62 00 Sheet Metal Flashing and Trim.
   6. Section 07 92 00 Joint Sealants.
   7. Section 08 14 00 Wood Doors (Restoration).
   8. Section 08 52 99 Wood Windows and Doors (Pella).
   9. Section 09 90 00 Painting & Coating.

1.04 SUBMITTALS

A. Submit for approval samples, product data.
B. Submit installation instructions for each product.
C. Submit mockup panels of 4’ x 4’ size for clapboards and trim with finish applied.

1.05 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Wood clapboard siding: White cedar bevel siding, grade “A & Better” for paint finish; all heartwood, radially cut; by Foster B. Blake, Jr. in Sedgwick, ME; 207-359-8356.
B. Removed and reinstalled wood clapboard siding: existing in situ materials where in good condition after selective demolition.
C. Building Wrap: Refer to Section 07 27 00 Air Barriers.
D. Exterior Trim: White cedar trim in the sizes and shapes shown on the drawings.
E. Fasteners: see 3.03 below.

PART 3 - EXECUTION

3.01 GENERAL

A. Examine substrate; report unsatisfactory conditions in writing. Beginning work means acceptance of substrates.
B. Install materials and systems in accordance with manufacturer's instructions, approved submittals and as required by the Drawings. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other Sections.
C. Prime clapboard and trim in the field or in the shop per the requirements for painting in Section 09 90 00 Painting and Coatings. Backprime all wood prior to installation. Field prime all cuts at the time of installation.
D. Where existing clapboords are removed and reinstalled, wash all sides prior to priming all sides. Renail existing board sheathing where clapboards are removed.
E. Install building wrap, seam tape and flex wrap in accordance with manufacturer’s instructions prior to installation of siding and trim. Seal all openings and transitions for provision of a complete air barrier.
F. Check integrity of all clapboards. Drill and renail where clapboards are loose
G. Restore damaged components. Clean and protect work from damage.

3.02 INSTALLATION OF CLAPBOARD SIDING

A. Follow installation instructions specified in the Western Red Cedar Lumber Association's publication, “How to Install Cedar Siding” for bevel siding, outside / inside corners, and field joints. For printed manual refer to Western Red Cedar Lumber Association (WRCLA), 1501-700 West Pender, Vancouver, BC V6C 1G8; 866-778-9096; www.wrcla.org.
B. Coordinate work with related trades; scribe and cope siding boards for accurate fit. Allow installation of related work to avoid cutting and patching.
C. Select siding boards of longest possible lengths. Discard boards that are warped, twisted, bowed, crooked or otherwise defective.
D. Double the starting course at the base of the wall and maintain constant thickness of clapboards throughout the installation.
E. Install bevel siding with smooth side facing out.
F. Provide reglet in upper trim and below window sills for receipt of top edge.

3.03 TREATMENT OF CLAPBOARD BUTT JOINTS

A. At all elevations of the Main House, provide scarf joints to match historic joinery details as evidenced on the facades. Use cut nails to match extant fasteners.
B. At all elevations of the Ell, provide butt joints and use stainless steel wire nails.

END OF SECTION

SECTION 07 53 23 – EPDM MEMBRANE ROOFING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, DIVISION 00 – PROCUREMENT & CONTRACTING REQUIREMENTS and PART B, DIVISION 01 – GENERAL REQUIREMENTS, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Fully adhered EPDM roofing membrance system.
   2. Adhesives, sealants, tapes, fasteners and termination bars.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition
   2. Section 06 10 00 Rough Carpentry
   3. Section 07 31 13 Asphalt Shingles
   4. Section 07 60 00 Sheet Metal Flashing and Trim

1.04 REFERENCES

A. Standards cited in the manufacturer's catalog, current as of the date of bidding documents, are incorporated herein by reference and govern the work.
B. Standards:
   1. American Society for Testing and Materials (ASTM): ASTM D4637.
   2. Factory Mutual Laboratories (FM): 90-mph wind uplift resistance.
   3. Underwriters Laboratories (UL): Class A.

1.05 SUBMITTALS

A. Submit under provisions of Section 01 33 00 Submittals.
B. Provide manufacturer's printed product information indicating material characteristics, performance criteria, and product limitations.
C. Samples of membrane, fasteners, metals, roof protection board and insulation.
D. Actual color samples for selection of finishes on fascias and gravel stops.
E. Manufacturer's Installation Instructions that indicate preparation required and installation procedures.
F. Shop Drawings to indicate, at a minimum, the following project components:
   1. Scaled roof plan with details referenced.
   2. Standard reference details of manufacturer's standards to meet specified warranty features and required wind uplift resistance.
   3. Membrane splicing and terminations.
   4. Inside and outside corner reinforcement details.
   5. Transition and penetration details.

G. Certification from roofing and accessory components manufacturers that all materials supplied comply with wind uplift requirements of 90 mph.
H. Submit a letter of certification from the manufacturer which certifies that the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.
I. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the Architect prior to the issuance of the manufacturer's warranty.

1.06 QUALITY ASSURANCE

A. The EPDM membrane roofing system must achieve a UL Class A and FM 1-90 rating.
B. The manufacturer must have a minimum of 20 years experience in the manufacturing of vulcanized thermal set sheeting.
C. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
D. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply EPDM roofing systems and having installed at least two (2) roofing applications of similar systems of equal or greater size within one year.
E. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.
F. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the Architect. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the Architect's consideration.
G. Upon completion of the installation, the applicator shall arrange for an inspection to be made by an approved technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the Architect at least seventy-two (72) hours prior to the manufacturer's final inspection.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
B. Do not overload any portion of the building, either by use of or placement of equipment, storage of debris, or storage of materials.
C. Store moisture susceptible materials above ground and protect with waterproof coverings.
D. Protect against fire and flame spread. Maintain proper and adequate fire extinguishers.
E. Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.

1.09 WARRANTY

A. Furnish manufacturer's 15-year Total System Warranty covering both labor and material with no dollar limitation. The maximum wind speed coverage shall be peak gusts of 90 mph, measured at 10 meters above ground level.
B. Provide manufacturer's supplemental warranty to cover labor and materials in the event of a material defect in the membrane for Twenty (20) years.
C. Pro-rated System Warranties shall not be accepted.
D. Warranties shall be dated from the date of Substantial Completion as determined by the Architect.

PART 2 - PRODUCTS

2.01 GENERAL

A. All components of the specified roofing system shall be products of the same manufacturer or accepted by the manufacturer as compatible.
B. Unless otherwise approved by the Architect and accepted by the membrane manufacturer, all products (including insulation, fasteners, fastening plates and edgings) must be manufactured and supplied by the roofing system manufacturer and covered by the warranty.

2.02 MANUFACTURER

A. Provide products manufactured by the following manufacturer:
   1. Carlisle-Syntec, PO Box 7000, Carlisle PA 17013; Tel 800-479-6832; Website:.http://www.carlisle-syntec.com/.
B. Substitutions are allowed if product meets or exceeds specification.

2.03 MEMBRANE

A. Furnish .060 inch thick non-reinforced black EPDM (Ethylene, Propylene, Diene Terpolymer) in the largest sheet possible. The membrane shall conform to the minimum physical properties of ASTM D4637.
B. As indicated on the Drawings, provide single sheets for each roof section. No membrane splices will be allowed with the exception of the area down slope of the lower chimney penetration.

2.04 UNDERLAYMENT

A. Underlayment shall be 1/2” AC exterior grade plywood screwed to renailed existing sheathing.

2.05 ADHESIVES AND CLEANERS

A. All products shall be furnished by the manufacturer and specifically formulated for the intended purpose.
   1. Bonding Adhesive
   2. Splicing Cement
   3. Splice Tape and Primer
   4. Cleaning Solvent
   5. External Seam Sealant or Lap Sealant

2.06 FASTENERS AND PLATES

A. Provide manufacturer's recommended fasteners and plates to provide additional membrane securement in order to meet the specified wind uplift resistance rating.

2.07 METAL EDGING AND MEMBRANE TERMINATIONS

A. Refer to Section 07 60 00 Sheet Metal Flashing and Trim.

2.08 OTHER MATERIALS

A. Miscellaneous related items as needed to fulfill project requirements and conditions, including, but not necessarily limited to:
   1. Cover strips, pressure-sensitive.
   2. Membrane flashings and joint overlays.
   3. Inside and outside corner reinforcements.
   4. Weathered membrane cleaner where indicated on the Drawings for preparation of EPDM prior to adhesion of self-adhered membrane underlayment at slope transition to shingled area.
   5. Water cut-off mastic.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing site conditions under provisions of Section 00 31 19.
B. Verify roof deck and edge conditions following demolition work of Section 02 41 00.
C. Verify renailing of roof sheathing per Section 06 10 00.

3.02 PREPARATION

A. Verify that the deck is structurally sound and free of deteriorated decking. Notify the Architect if any deteriorated decking is uncovered after removal of existing roofing.
B. Verify that the deck is dry, sound, clean and smooth.
C. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, jobsite considerations and weather restrictions.

3.03 UNDERLAYMENT PLACEMENT

A. Install plywood substrate over existing sheathing with boards butted tightly together with no joints or gaps greater than 1/4 inch. Stagger joints.

3.04 MEMBRANE PLACEMENT AND BONDING

A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.
B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
   1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
   2. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.

C. Install adjoining membrane sheets in the same manner, overlapping edges approximately 4 inches. Do not apply bonding adhesive to the splice area.

3.05 MEMBRANE SPLICING – TAPE

A. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.
B. Fold the top sheet back and clean the dry splice area (minimum 2-1/2 inches wide) of both membrane sheets with primer as required by the membrane manufacturer.
C. Where splice tape is not pre-applied, apply splice tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch.
D. Remove the release film and press the top sheet onto the tape using hand pressure.
E. Roll the seam toward the splice edge with a 2 inch wide steel roller.
F. Install a 6 inch wide section of Pressure-Sensitive Flashing or Elastoform Flashing over all field splice intersections and seal edges of flashing with Lap Sealant.

3.06 FLASHING

A. Wall and chimney flashing shall be red copper.
B. Follow manufacturer's typical flashing procedures for interface with metal flashings by others.

3.07 DAILY SEAL & TEMPORARY WATERSTOP

A. All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses.
B. All temporary waterstops shall be constructed to provide a 100% watertight seal. The stagger of the insulation joints shall be made even by installing partial panels of insulation. The new membrane shall be carried into the waterstop. The waterstop shall be sealed to the deck and/or substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of sealant. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, insulation fillers, etc. shall be removed from the work area and properly disposed of off site. None of these materials shall be used in the new work.
C. If inclement weather occurs while a temporary waterstop is in place, the Contractor shall provide the labor necessary to monitor the situation to maintain a watertight condition.
D. If any water is allowed to enter under the newly-completed roofing, the affected area shall be removed and replaced at the Contractor's expense.
E. Provisions for temporary connections to existing roof drains shall be established as needed to prevent the ponding of water or infiltration into the substrate and building interior. Any damage to the substrate or the building interior shall be repaired or replaced by the Contractor at no additional expense to the Owner.

3.08 SPECIAL CONDITIONS PROCEDURE

A. As indicated on the Drawings, clean the upper slope portion of EPDM with weathered membrane cleaner prior to installation of Grace Ultra as self-adhered underlayment for asphalt shingles per Section 07 31 13. Follow Carlisle’s instructions for use of the cleaner for proper application to the EPDM.

3.09 COMPLETION

A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally-acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.
C. Prior to demobilization from the site, the work shall be reviewed by the Architect and the Contractor. All defects noted and non-compliances with the Specifications or the recommendations of the manufacturer shall be itemized in a punch list. These items must be corrected immediately by the Contractor to the satisfaction of the Architect and manufacturer prior to demobilization.
D. All Warranties referenced in this Specification shall be dated as of the date of Substantial Completion as established by the Architect.

END OF SECTION

SECTION 07 60 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but limited to the following:
   1. Copper gutters, gutter outlets, wirre baskets and downspouts.
   2. Copper eave apron, drips and cleats.
   3. Copper flashing.
   4. Copper shower pan.
   5. Copper head flashing at windows, doors and setting blocks.
   6. Any other items as indicated on the Drawings or required by the Work.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 02 41 00 Demolition.
   2. Section 07 31 13 Asphalt Shingles.
   3. Section 07 46 23 Wood Siding.
   4. Section 07 53 23 EPDM Membrane Roofing.
   5. Section 08 52 00 Wood Windows (Restoration).
   6. Section 08 52 99 Wood Windows & Doors (Pella).
   7. Section 09 90 00 Painting & Coating.

1.04 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Specialist.
   1. The term "Specialist" as used in this specification shall mean an individual or firm of established reputation for performance of work of highest quality, or, if newly organized, whose personnel have previously established a similar reputation in the same field, which is regularly engaged in, and which maintains a regular force of workman skilled in either manufacturing or fabricating items required by the Contract, installing items required by the Contract, or otherwise performing work required by the Contract.
   2. The Specialist shall demonstrate previous successful trade work with the installation and repair of similar copper sheet metal work and flashings of at least three comparable buildings.
B. The Specialist shall coordinate all flashing and metal work with all associated work specified under other Sections. Coordinate work of this Section with other work for proper sequencing of each installation and use of scaffolding. Ensure best possible weather resistance and durability of the work and protect all interior and exterior materials and finishes.

C. Work shall only be performed when weather is dry and weather reports call for a continuation of dry weather. Specialist shall fully cover unfinished work as required to provide full weather protection and shall be held responsible for any and all damage to the existing building, its finishes and furnishings resulting from or caused by the work of this Section. The Specialist shall coordinate the work of all trades to ensure a weathertight and complete installation.
D. Deliver and store all materials so as not to damage. Store materials in locations designated by the Owner. Provide protection as required during storage.
E. The Specialist shall take all necessary field measurements prior to fabrication and installation of work and shall assume complete responsibility for accuracy of same.

1.05 WARRANTY

A. Provide a written warranty against all defects in materials and workmanship, including but not limited to leakage, cracking, pitting and splitting, for all the work of this Section for a period of two (2) years from acceptance of completed work.

1.06 SUBMITTALS

A. General: Submit the following according to the Conditions of Contract and Division 1 Specification Sections.
   1. Product data for each type of product specified. Submit manufacturer's detailed technical product data, installation instructions and recommendations, including necessary data to document that materials comply with requirements.
   2. Samples for verification purposes of each type of materials required.
   3. Shop Drawings of gutters, drips, head flashing and shower pan. Highlight any proposed variations between the shop drawings and profiles noted in the Drawings. Fabricated samples will be accepted in lieu of shop drawings.
   4. Provide fabricated sample of gutter.
B. Material Safety Data Sheets (MSDS) for each material used.

PART 2 - PRODUCTS

2.01 SHEET METAL FLASHING AND TRIM MATERIALS

A. Copper Eave Apron, Drip, Flashing and Trim:
   1. Red Copper shall be cold-rolled sheet or coil; soft temper if required for forming; 20-ounce or in weight indicated on the drawings; ASTM B 370.
   2. Apron shall be fabricated of standard 18” x 24” flat sheets, lock seamed and soldered at all joints.
B. Rain leaders shall be corrugated red copper downspouts in 3” diameter. Fabricate as indicated or required by the details. Provide all required offsets and brackets necessary to keep the downspouts plumb and close to the building.
C. Copper gutters shall be 20-ounce red copper with extended integral flange. Provide copper bar stiffeners, twist strap supports and profile as shown.
D. Downspout boots shall be 3” cast iron for providing transitions between exterior downspouts and interior drain piping. The boots shall be provided by the General Contractor or its plumbing subcontractor.
E. Copper leaf strainer, one per gutter outlet, removable for cleaning.
F. Rosin-sized paper shall be smooth, unsaturated building paper weighing approximately 3 to 4 pounds per 100 square feet.
G. Nails for fastening sheet metal to wood - brass or copper, of "stronghold" type, with large flat heads, annular rings, and needle points, no smaller than No. 12 stub gauge and of sufficient length to penetrate the wood blockings, nailers, etc., not less than 7/8" long, but not so long that they penetrate through the underside of the roof or trim boarding. Nails for fastening to masonry shall be non-corrosive; choice of fasteners shall be determined by field tests at existing substrate.

H. Screws, bolts, and other accessories used for fastening sheet metal to wood or to non-ferrous metals shall be brass or copper, and shall be equipped with soft neoprene self-sealing washers.
I. Solder composition - 50% block tin and 50% pig lead, and shall conform to ASTM specifications B32.
J. Flux shall be rosin core or muriatic acid killed with zinc. All acid is to be thoroughly washed off after soldering is completed.
K. Wedges for flashing - rolled from 2 1/2 lb. lead sheets.
L. Butyl sealants – Pecora BA-98 non-hardening butyl for concealed setting beds and joints between copper sheets; Pecora BC-158 butyl rubber sealant (black) for exposed locations, including joint between copper downspouts and cast iron boots. DO NOT USE SILICONE SEALANTS IN CONTACT WITH OR IN CLOSE PROXIMITY TO COPPER FLASHINGS.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Reference Standards. Except as otherwise indicated, comply with manufacturer`s installation instructions and recommendations, and with "Copper and Common Sense" by the Revere Copper and Brass Co. Inc., and with "Sheet Copper Applications" by the Copper Development Association Inc., 405 Lexington Ave., New York, N.Y. 10174.
B. Surface Preparation:
   1. Inspect work performed by others, including substrate conditions, prior to installation. Report any unacceptable conditions to the General Contractor.
   2. Install self-adhered high-temperature membrane (Grace Ultra) where indicated on the Drawings.
   3. Install rosin-sized paper where indicated on the Drawings or where required by the work.
   4. Separate dissimilar metals from immediate contact with coatings or separation sheets appropriate for permanent separation of the metal surfaces.
C. Fabrication and Installation:
   1. Sheet Metal Flashing Installation: Install sheet metal flashing and self-adhered membrane as indicated and in compliance with details and recommendations of the ”NRCA Low Slope Roofing Manual.”
   2. Shop fabricate work. Corners shall be mitered with flat lock seams and neatly soldered.
   3. Anchor units of work securely in place by methods indicatedor as recommended by manufacturer, providing for thermal expansion of metal units. Conceal all fasteners where possible using 2" wide copper cleats nailed with two nails per cleat per foot. Do not face nail any flashings. Use continuous cleats at drip edges.
   4. Install work with laps, joints and seams that will be permanently watertight and weatherproof, and shall be without waves, buckles, or distortion. All components to be soldered shall be tinned around and on both sides twice the width of the lock seam to be used.
D. Sheet copper shall not be installed in contact with or in close proximity to fire retardant lumber or other fire retardant building materials. Refer to the manufacturer’s specifications and warranties, for use with special types of exterior fire retardant treatments.

END OF SECTION

SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not necessarily limited to the following:
   1. Joint sealers at intersection of building components and at control and expansion joints.
   2. Backer rods at intersection of building components.
   3. Waterstops at construction joints in stone foundation wall.
   4. Waterstops at intersections of concrete bulkhead construction.
   5. Waterstops at basement slab to adjacent walls and to exposed ledge.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 03 30 00 Cast-in-Place Concrete.
   2. Section 04 20 00 Unit Masonry.
   3. Section 07 11 13 Bituminous Dampproofing.
   4. Section 07 46 23 Wood Siding.
   5. Section 08 51 69 Metal Storm Windows.
   6. Section 08 52 00 Wood Windows (Restoration).
   7. Section 08 52 99 Wood Windows & Doors (Pella).
   8. Section 09 90 00 Painting & Coating.

1.04 SUBMITTALS

A. Submit for approval samples and product data.
B. Submit actual samples of sealant material for color selection. Color brochures or charts will not be acceptable.
C. Submit installation instructions for each type of joint sealer.
D. Submit results of field adhesion tests for review and approval prior to application.

1.05 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS – JOINT SEALERS

A. Joints designed for expansion and movement conditions at site:
   1. Exterior vertical joints: One-part moisture curing, gun grade polyurethane sealant in standard color; Tremco Vulkem 116 or approved equal.
   2. Perimeter of Exterior Door and Window Frames: One-part part moisture curing, gun grade polyurethane sealant in standard color; Tremco Vulkem 116 or approved equal.
   3. Joint filler: Resilient, pre-molded asphalt impregnated fiberboard.
   4. Primers, bond breakers, and backer rods shall be compatible with the sealant and adjacent surfaces.

2.02 MATERIALS – WATERSTOPS

A. A 20 mm X 10 mm flexible hydrophilic rubber strip composed of non-vulcanized rubber and urethane polymer as the hydrophilic agent. The product shall have a stainless steel wire mesh embedded in the product to direct expansion in the thickness direction and to restrict expansion in the longitudinal direction. The product shall develop no less than 400 psi expansion pressure. The product shall be NSF Certified for potable water use and shall meet the minimum performance requirements as shown in the following table:

PROPERTY	METHOD	MC-2010MN
Hardness Hs	ASTM D 2240	*Not less than 30 + 6
Tensile Strength psi	ASTM D 412	*Not less than 100 psi
Elongation (%)	ASTM D 412	*Not less than 500 %
Specific Gravity	ASTM D 792	1.18+ 0.15
Expansion Coefficient by volume	In House	Not Less than 1.9
Mass Change%[1]		Not greater than 5.0%

*Based on rubber compound.

[1] Mass Change % measures the durability of the product, reflecting the amount of material lost through repeated cycles of hydration and dehydration.

B. Manufacturer and Products: “Adeka Ultra Seal” Waterstops by Asahi Denka Kogyo K.K. distributed by OCM, Inc.; pre-formed rubber, paste type, and liquid types complying with the following:
   1. Cold/construction joints, piping penetrations where pipe is over 24-inch diameter, general concrete work, MC-2010MN.
   2. Waterstop between cold/construction joints, piping penetrations under 24-inch diameter, MC-2005T with adhesive tape.
   3. Waterstop for crack repair, precast joints, piping penetrations, cold/construction joints, expanded metal forms, sheet pile interlock, used on rough concrete in conjunction with MC-2010MN, Paste Type P-201.

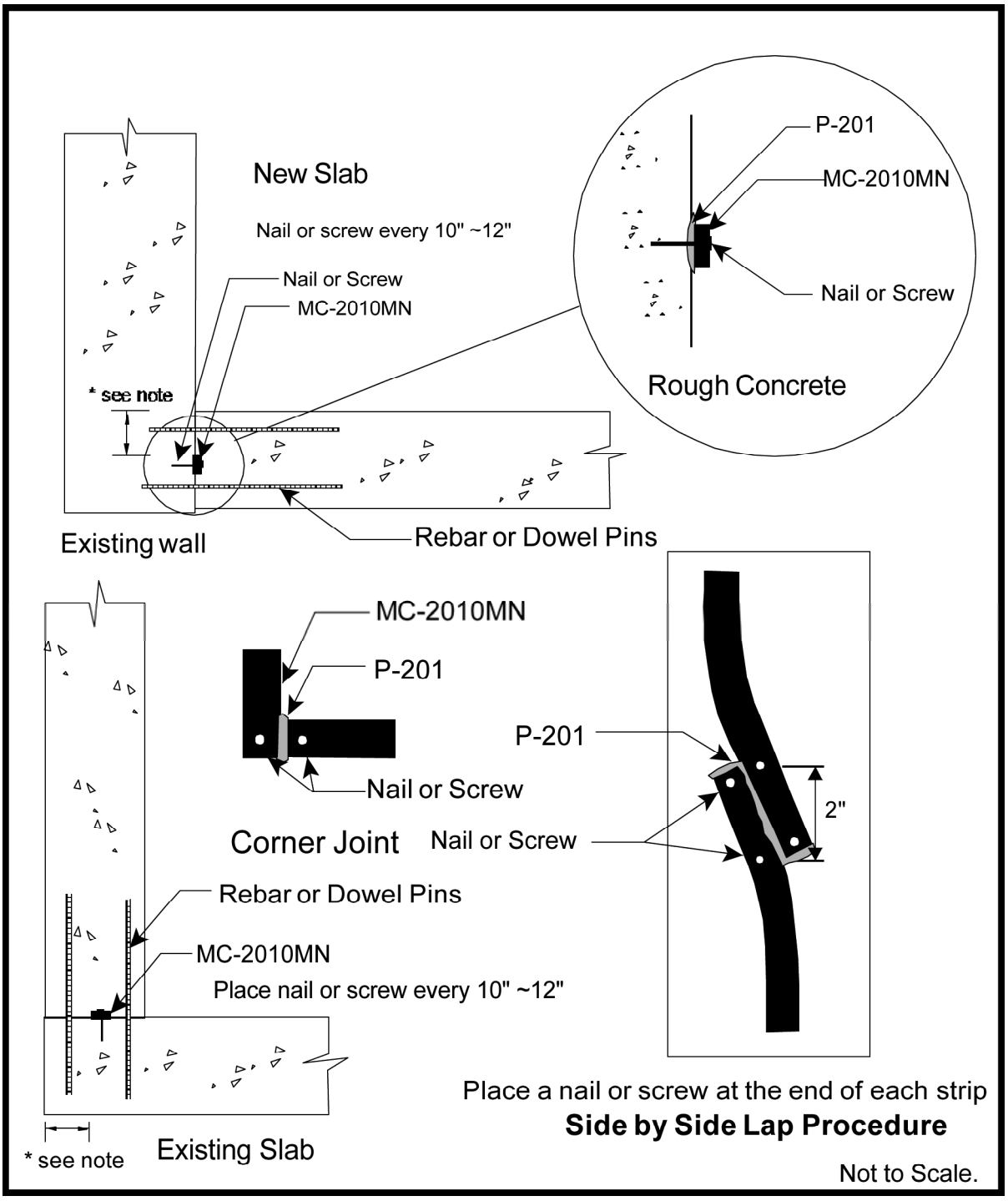
PART 3 - EXECUTION

3.01 INSTALLATION – GENERAL

A. Examine substrate; report unsatisfactory conditions in writing. Beginning work means acceptance of substrates.
B. Provide exposed joint sealers in colors as selected the Architect from manufacturer's standards.
C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
D. Clean and prime joints, and install bond breakers, backer rods and sealant as recommended by manufacturers.
E. Depth shall equal width up to 1/2" wide; depth shall equal 1/2 width for joints over 1/2" wide.
F. At each type of joint sealer application, perform a field adhesion test in accordance with methods prescribed by the manufacturer. Do not commence with application of joint sealers until a successful test has been performed and the results have been submitted to the Architect for review.
G. Cure and protect joint sealers as directed by manufacturers. Notify General Contractor when sealants that will be painted (e.g. – exposed areas at window frames, casings and siding) have cured sufficiently for receipt of paint. Replace or restore damaged joint sealers. Clean adjacent surfaces to remove spillage.

3.02 INSTALLATION – WATERSTOPS

A. Examine substrate; report unsatisfactory conditions in writing. Beginning work means acceptance of substrates.
B. Place a small bead of Adeka Ultra SealP-201 on any rough or scarred area prior to attaching MC-2010MN.
C. Attach MC-2010MN to the concrete or adjacent parged edge of masonry by one of the following methods:
    1. Attach with nails or concrete screws placed every 10" ~ 12" (approximately).
    2. If the concrete is rough, apply P-201 prior to attaching MC-2010MN.
    3. If the concrete is smooth, clean and dry, apply one of the following prior to attachment:
        a. Adeka Ultra Seal P-201
        b. 3M-2141 Rubber Adhesive.
        c. Bostik 1142M Rubber Adhesive.
        d. Hilti CA 3200 Adhesive.
D. Site conditions may warrant the use of a combination of attachment methods. Use P-201 on all corner joints and parallel splices. Overlap parallel splices 2” and apply P-201 at ends and between adjacent stripes of MC-Z010MN.
E. Keep MC-2010MN taut and flat against the concrete during the attaching process. Do not allow any gaps between the concrete and the MC-2010MN.
F. MC-2010MN must be placed between two rows of rebar. The required concrete coverage varies from 3.25" ~ 4.0" depending on concrete strength. For example, if concrete psi is 4260 or greater the required concrete coverage is >3.2". If the concrete psi is 2550 or less, the required coverage is >4". For complete coverage information see MC Coverage Chart or call 800.999.3959.
G. Protect waterstops from damage prior to and during installation of abutting concrete.
H. Placement of waterstops shall follow Manufacturer’s printed installation instructions.


New Slab
Nail or screw every 10" ~12"
Nail or Screw
MC-2010MN
* see note
Existing wall
Rebar or Dowel Pins
P-201
MC-2010MN
Nail or Screw
Rough Concrete
MC-2010MN
P-201
Nail or Screw
Corner Joint
Nail or Screw
Rebar or Dowel Pins
MC-2010MN
Place nail or screw every 10" ~12"
* see note
Existing Slab
P-201
2"
Place a nail or screw at the end of each strip
Side by Side Lap Procedure
Not to Scale.

3.03 INSTALLATION – LOCATIONS

A. Provide waterstop at construction joints between stone infill and adjacent stone masonry of foundation wall at former bulkhead and cellar sash. Parge adjacent masonry for smooth abutment prior to placement of waterstop and concrete infill.
B. Provide waterstop at construction joints between bulkhead walls and existing stone, bulkkhead walls and footings, and bulkhead slab and surrounding construction.
C. Provide waterstop at construction abutment of concrete slab in basement with surrounding exterior stone walls, interior masonry walls, and areas of exposed ledge.
D. Provide sealant over backer rod at intersection between exterior wall sheathing and adjacent stone masonry walls at base of water table boards. Sealant shall be placed and allowed time to cure prior to placement of building wrap.
E. Provide sealant at intersection of exterior wood trim components with wood siding.
F. Provide sealant at perimeters of doors and windows at intersection of wood casings and wood siding.
G. Provide sealant at perimeters of wood setting blocks at intersection with wood siding.
H. Provide sealant in the pre-formed frame channel of exterior metal storm windows prior to installation. Touch-up detailing after installation per Section 08 51 69.
I. Provide sealant over backer rod at penetration of rain leader boots through exterior wall of building.
J. Provide sealant in any other locations as noted on the drawings or as required to provide a water-tight and weather-resistant exterior building envelope.

END OF SECTION

SECTION 08 11 00 – METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not necessarily limited to the following:
   1. Steel Frames.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition.
   2. Section 06 10 00 Rough Carpentry.
   3. Section 08 14 00 Wood Doors.
   4. Section 08 71 00 Door Hardware.
   5. Section 09 26 13 Gypsum Veneer Plaster.

1.04 SUBMITTALS

A. Submit for approval product data, warranty information, construction details.

1.05 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Frames: Cold-rolled steel sheet in gauge and assembly as follows:
   1. Interior Frames: 16 gauge, factory primed.
   2. Door Frame construction: fully welded, mitered corners.
B. Finish: Rust-inhibiting primer on standard doors and frames, shop applied.
C. Fire rating: UL labeled, fire-rated assembly where required.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Fabricate all work to be rigid, neat and free from seams, defects, dents, warp, buckle, and exposed fasteners. Install doors and frames in compliance with SDI-100, NFPA 80, and requirements of authorities having jurisdiction.
B. Provide secure attachment at perimeter of framed openings in drywall partitions. At masonry openings, fully grout frame to provide continuous interlock with adjacent construction.
C. Prepare doors and frames to receive hardware on final schedule. Provide for 3 silencers on single door frames except where weather stripping or sound gaskets are to be provided. Provide for 2 silencers at head of frames for pairs of doors. Provide reinforcement plates in frames and doors as required for hardware application.
D. Field measure existing doors and existing hardware locations for fabrication of frames to match required configurations.
E. Shop Finish: Clean, treat and prime paint all work with rust-inhibiting primer comparable with finish paint specified in Section 09 90 00 Paints and Coatings. Provide asphalt emulsion sound deadening coating on concealed portions of interior frames.
F. Touch-up damaged coatings and leave ready to receive finish painting.

END OF SECTION

SECTION 08 14 00 – WOOD DOORS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not necessarily limited to the following:
   1. Provide wood doors.
   2. Provide wood door frames.
   3. Modify, repair and service existing wood doors and frames to be salvaged and reused.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition.
   2. Section 06 10 00 Rough Carpentry
   3. Section 06 20 13 Exterior Finish Carpentry.
   4. Section 06 20 23 Interior Finish Carpentry.
   5. Section 08 11 00 Metal Doors and Frames.
   6. Section 08 52 99 Wood Windows and Doors (Pella).
   7. Section 08 71 00 Door Hardware.
   8. Section 09 90 00 Painting & Coating.

1.04 SUBMITTALS

A. Submit for approval product data, warranty information (one year minimum), construction details, elevations, door types, material samples, wood characteristics and scope of work on existing doors.

1.05 DELIVERY AND HANDLING

A. Protect doors during transit, storage and handling to prevent soiling and damage.
B. Prior to delivery, building shall be completely enclosed and dry. Conform to AWI requirements for environmental conditions.
C. Store doors at least four inches above the floor on a flat, level surface in a clean, dry, well ventilated area.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Interior Custom Doors: Custom wood stile-and-rail flat panel in solid lumber in wood specie to match existing historic doors. AWI premium grade.
B. Interior Fire-Rated Wood Doors: Flush solid core fire-rated doors with surface applied panel mouldings as indicated in the Drawings.
C. Interior Wood Panel Doors: Lemieux primed panel doors C-44-P and B-82-P or approved equal.
D. Interior Custom Wood Frames: Solid lumber in specie to match existing historic frames where indicated or to be simplified versions (e.g., flat stock where noted).
E. Exterior Custom Wood Frames: Solid lumber in specie to match existing historic frames where deterioration is severe and replication is the recommended treatment.
F. Existing Wood Doors and Frames: Restore components as required.
G. Other Doors and Frames: In configurations as indicated in the Drawings.
H. Finishing: Doors shall be finished on all six sides for full coverage under the Work of Section 09 90 00 Painting and Coating.

PART 3 - EXECUTION

3.01 EXAMINATION & PREPARATION

A. Verify adequacy of framed opening conditions and schedule repairs where needed.
B. Verify that framed opening sizes and tolerances are ready to receive doors and frames.
C. Condition doors to prevailing temperature and humidity prior to installation.
D. Do not install doors in openings until the risk of damage from other trades has been minimized.
E. Restore existing doors, frames and components in accordance with the wood restoration specifications as described in Section 08 52 00 Wood Windows.
F. Fabricate new doors, frames and components as indicated on the Drawings.

3.02 INSTALLATION

A. Install work in accordance with AWI Custom Quality Standard and manufacturer's written instructions.
B. Set and secure material and components in place, plumb and level.
C. Install doors in accordance with NFPA 80.
D. Trim door height by cutting bottom edges to a maximum of 3/4" (19mm).
E. Pilot drill screw and bolt holes.
F. Core for handsets and cylinders.
G. Coordinate installation of doors, frames, glass, glazing and accessories.
H. Site glaze or in shop in accordance with Section 08 80 00 Glazing.

3.03 ADJUSTING AND CLEANING

A. Conform to AWI Standards for fit and clearance tolerance.
B. Conform to AWI Standards and Test for warp, cup, bow and telegraphing. Replace any door that exceeds allowable tolerances.
C. Reseal or refinish the edges, including concealed edges (top and bottom) of any doors that require site alteration.
D. Rehang or replace any doors that do not swing or operate freely even after attempting to re-fit and re-install.
E. Clean and protect wood doors from damage until acceptance of the Work.

END OF SECTION

SECTION 08 51 69 – METAL STORM WINDOWS

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Prefinished aluminum triple-track storm windows.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 01 50 00 Temporary Facilities and Controls.
   2. Section 02 41 00 Demolition.
   3. Section 07 46 23 Wood Siding.
   4. Section 07 92 00 Joint Sealants.
   5. Section 08 52 00 Wood Windows.
   6. Section 09 90 00 Painting and Coating.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 33 00 Submittal Procedures.
B. Product Data: Manufacturer's data sheets for specified products showing compliance with specified requirements; include installation instructions.
C. Glass Information: Submit a written statement regarding the need or lack thereof for the provision of safety glazing in the storm windows based on their respective locations and sizes. Refer to the applicable provisions of the International Building Code, Safety Glazing.
   1. Provide clear tempered glass at Units A1, A2, A3, A4, A5, A6, A7, D1, J1, J2, and J4.
   2. Provide clear double strength glass at other locations unless determined otherwise.
D. Shop Drawings: Show dimensions, layout, profiles and product components; details of anchoring and fastening; sealants and weatherstripping; and recorded field measurements.
E. Finish Samples: Submit color samples, for approval by Architect, that represent the allowable range of finish established from production material specified.
F. Component Samples: Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components.
G. Operation and Maintenance Data: Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
H. Executed warranty documents specified.

1.05 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
B. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
   1. Store inside, if possible, in a clean, well-drained area free of dust and corrosive fumes.
   2. Stack vertically or on edge so that water cannot accumulate on or within materials. Use non-staining wood or plastic shims between components to provide water drainage and air circulation.
   3. Cover materials with tarpaulins or plastic hung on frames to provide air circulation.
   4. Keep water away from stored assemblies.

1.06 WARRANTY

A. Manufacturer's Warranty: Submit manufacturer's standard warranty document executed by authorized company official, against defects in materials and workmanship for period of one year from the date of Substantial Completion. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under the Contract.

1.07 TESTING AND PERFORMANCE REQUIREMENTS

A. Test Specifications: Provide test results in accordance with AAMA 1002.10-93, “Aluminum Insulating Storm Products for Windows and Sliding Glass Doors.” Meet or exceed the performance requirements for DP-20 rating.
B. Required Test Results
   1. Operating Force: 17 lbs
   2. Air Infiltration – ASTM E 283: 0.04 cfm/ft@ 1.57 psf (25 mph)
   3. Water Resistance – ASTM E 331: No leakage with and without screen at WTP = 4.0 psf for three minutes.
   4. Uniform Load Structural: No damage @ 30 psf exterior and interior.
   5. Safety Drop Test: No damage
   6. Glass and Screen Inserts: Squareness Test 1/16” maximum.
   7. Attachment of Insert Screening to Frame Test: 40 lb. minimum.
   8. Concentrated Load and Glass Adherence Test, Sash: 15 lb. minimum.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Acceptable Manufacturer: Harvey Industries; 1400 Main Street; Waltham MA 02451-1623; 781-398-7700; www.harveyind.com.
B. Product: Double-Hung “Tru-Channel” Storm Window.
C. Requests for substitutions will be considered in accordance with provisions of Section 01 33 00 Submittal Procedures and 01 60 00 Product Requirements.

2.02 STORM WINDOW COMPONENTS

A. Storm Windows - General: Provide units that fit windows and overlap exterior blind stops in order to allow adequate clearance between pre-drilled screw hole in aluminum frame and wood edge.
   1. Verify actual measurements of openings by field measurement before fabrication; show recorded measurements on shop drawings.
   2. Allow for out-of-square and irregular conditions.

3. Verify frame and sill conditions of each opening before fabrication; provide appropriate fabrication details to suit existing conditions.

B. Materials: All aluminum extrusions shall be 6060 and 6063-T5 heat-treated aluminum alloy with a nominal wall thickness of .050". Self-tapping screws used in the assembly of the window shall be pre-finished stainless steel to match color of frames.

C. Frame Construction: The frame shall be of butt-type construction anchored with two stainless steel self-tapping screws at each corner. Each screw shall be driven into an extruded boss, which is an integral part of the jambs. The jamb shall form a channel that receives the sash and holds it securely in place between two sections of woolpile weatherstripping. The sill shall incorporate double fin type weatherstripping running the full width of the sill. The sill and bottom sash shall interlock in a tongue and groove manner for additional weather protection when in the closed position. There shall be an adjustable expander on the sill to compensate for out-square opening. The sill expander shall have two weep holes to allow drainage to the outside. The header frame shall provide penetration of the top sash by 3/4" and be sealed with fin type weatherstripping on the inside frame leg and heavy duty woolpile on the outside of sash head. The frame shall have an integral concealed RIGID-BAR at the meeting rail which shall incorporate two full lengths of fin type weatherstripping, one on each side, and two extruded legs into which both sash interlock independently. The RIGID-BAR shall be a hollow aluminum extrusion with two screw bosses permitting it to be fastened in place by four stainless steel screws driven through the main frame. Installation flange shall be pre-punched. A snap-on finished cover shall be applied to inside stile at the meeting rail.

D. Sash Construction: Glass inserts shall have spring loaded zinc-die cast latches with 5/8" operating space to allow easy operation. Sash corners shall be mitered and joined with zinc die-cast corner keys and secured with stainless steel screws through the vertical rails for easy glass replacement.

E. Screen Construction: Screen frame shall be of hollow extruded design with overlaps at sides of frame. Heavy-duty woolpile shall be inserted in the top of the screen section to provide an effective insect seal when in the summer position. Screen wire shall be 18 x 16 mesh; non-glare charcoal finished aluminum and shall be held in place with corrugated vinyl screen spline.

F. Operation: Each operable window shall be complete with two operating sash and one screen insert. The Tru-Channel window shall be of triple channel design, constructed to form back retaining walls for both glass inserts when in the closed position. Each glass insert and screen shall ride in its own channel, guided by top pivot pins and shall be removable from inside without the use of tools. There shall be a minimum of four locking positions for the lower sash.

G. Hardware: All spring-loaded latches are to be black finish zinc die-cast. Screen latches are to be of teardrop design to facilitate easy accessing to screen insert.

H. Glazing: Standard and tempered glazing shall be marine glazed in vinyl channel.

I. Weatherstripping: All critical areas shall be double weatherstripped with a fin type weatherstripping.

J. Finishes: All window finishes shall be electrostatically applied baked acrylic in manufacturer's standard colors. Architect shall select one standard color for cellar sash and another standard color for all other units.
   1. Cellar Sash Storms – assume BLACK for pricing purposes.
   2. All Other Storms – assume ALMOND for pricing purposes.
   3. Final selections shall be made by the Architect following submittal of actual materials samples of standard colors.

K. Sealant: High-performance, low modulus, gun-grade, one-part polyurethane sealant in color to be selected by Architect from standard color chart. Product shall be Tremco DYMONIC or its equivalent.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that openings are within allowable dimensional tolerances, plumb, level, and clean. Provide solid anchoring surface. Confirm that storm windows furnished to the site are in accordance with approved shop drawings.
B. Verify that wood blind stops of exterior windows have been fully restored or replaced and that they have received their final finishes prior to installation of storm windows.
C. Do not install windows until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions, including product data, technical bulletins, catalog installation instructions, and carton instructions.
B. Install storm windows straight, plumb and level, securely fastened, and without distortion.
C. Fully seal abutment of frame to wood window components for weathertight installation. Lay continuous sealant bead in frame flange sealant receptor. Tool and clean up excess sealant at frame after installation.
D. Adust sill piece tight to wood sill. Seal edges and ends of adjustable sill to wood. Retain clear openings at factory installed weeps.
E. Adjust as required for proper operation of operable units.

3.03 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08 52 00 – WOOD WINDOWS (RESTORATION)

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but limited to the following:
   1. Repair and restoration of wood windows.
   2. Replacement of portions of wood windows.
   3. Provision of wood windows to match existing or missing details.
   4. Removal of contemporary door sidelights and provision of replica sidelights.
   5. Provision of sealant at perimeter of exterior window openings.
   6. Window hardware.
   7. Glass and shop glazing related to work of this section.
   8. Shop preparation and painting of wood windows.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 01 50 00 Temporary Facilities.
   2. Section 02 41 00 Selective Demolition.
   3. Section 07 46 23 Wood Siding.
   4. Section 07 60 00 Flashing and Sheet Metal.
   5. Section 08 51 69 Metal Storm Windows.
   6. Section 08 80 00 Glazing.
   7. Section 08 51 69 Metal Storm Windows.
   8. Section 09 90 00 Painting.
B. Work related to Pella Windows is not included in the Work of this Section. Refer to Section 08 52 99.

1.04 SUBMITTALS

A. General: Refer to SECTION 01 33 00 – SUBMITTAL PROCEDURES for submittal provisions and procedures as applicable for the work of this Section.
B. Shop Drawings: Submit Shop Drawings for proposed replacement components. Show all relevant details, profiles, dimensions, joinery and methods of attachment.
C. Product Data and Material Samples: Submit complete product data sheets, installation instructions and general recommendations for the materials listed. Submit samples of actual materials as applicable:
   1. Wood for replacement window components.
   2. Epoxy repair system for wood repairs.
   3. Glass and Glazing.
   4. Window hardware.
   5. Paint products.

6. Paint removal products.

D. Mock-Up Sample:
   1. Upon review and approval of all submittals noted above, perform complete specified repair and restoration treatment on a typical double hung window to be selected by the Architect.
   2. Obtain Architect's approval of the mock-up prior to proceeding with repair and restoration work on the remaining windows. No other work described within this Section, including mobilization and purchase of materials, shall commence until approval of the completed mock-up.
   3. Staging provided by the General Contractor shall remain in place for review of mock-up.
   4. Protect the approved mock-up until the completion of all the work of this Section.
   5. Approved mock-up shall represent the minimum acceptable standard for the project.

1.05 QUALITY ASSURANCE

A. Window Repair & Restoration Specialist: Work shall be performed by a firm having not less than five (5) years successful experience in comparable wood window repair and restoration projects and employing personnel skilled in the processes and operations required.
   1. Specialist must have performed work of a similar nature on a least three (3) historic buildings similar to the existing building.
   2. Specialist must utilize skilled workers who have previously demonstrated experience in the work of this Section.
   3. Specialist must be acceptable to, or certified by, the manufacturer of the epoxy system to be utilized for restoration and repair work.

1.06 REFERENCE STANDARDS

A. Woodwork Standards: Newly furnished elements, if any, shall be manufactured in compliance with the requirements for "Premium" grade workmanship as specified in "Quality Standards of the Architectural Woodwork Industry" as published by the Architectural Woodwork Institute, except where more stringent requirements may be specified in this Section.

B. Glazing Standards: Comply with recommendations of the Flat Glass Marketing Association (FMGA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements may be specified in this Section.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

B. Store materials only in designated areas and in compliance with the manufacturer's requirements for minimum and maximum temperature and other conditions. Keep materials in tightly closed containers and away from open flames.

C. Discard and remove from the job site any materials damaged in handling and storage; any materials that have been subjected to conditions contrary to manufacturer's recommendations, and; any materials whose maximum shelf life has expired.

1.08 PROJECT CONDITIONS

A. Environmental Requirements: Epoxies, glazing, sealants and paint may only be applied to surfaces when air, surface and material temperature and moisture content are within the range approved by the manufacturers. Proceed with work only when existing and forecasted weather conditions permit work to be performed in accordance with the manufacturer's requirements.

B. Prevent Spillage of repair and restoration materials onto adjacent interior and exterior surfaces that may be exposed to damage or staining. Clean up spills and drips immediately and refinish any areas that are affected by the work of this Section.
C. Substrate Conditions must be inspected and determined to be in satisfactory condition prior to the installation of products specified in this Section.
D. Paint & Glazing Compound Removal must be performed with the utmost care and concern for both the integrity and preservation of the historic materials and the safety and health of workers, building occupants and the public.
   1. Note that the existing paint may contain lead. Take all necessary precautions and conform with all applicable local, state and federal regulations.
   2. Select removal methods that fully comply with regulations and that will not damage existing wood and surrounding surfaces. Refer to the "Paint Removal" portion of SECTION 09 90 00 – PAINTING & COATING for requirements.
   3. Do not use torches, heat guns or any type of heat-generating equipment that will damage the wood surface, break the glass or create a fire hazard to the existing building or to existing materials temporarily removed from the building for repair and restoration.
   4. Properly dispose of all residue generated from paint and putty removal in accordance with all applicable regulations.
E. Scheduling & Coordination: Coordinate the repair and restoration work with related work including the provision of temporary protection, staging and exterior building envelope. Comply with the Owner's requirements for maintaining security for the building and its occupants.

1.09 GUARANTEE

A. Provide written guarantee ensuring that all replacement wood elements, patching materials and sealant joints shall remain sound and free of defects, cracks, joint failure, peeling, deterioration, and discoloration for a minimum period of two (2) years from the date of Substantial Completion. Further state that any such defects occurring within the warranty period will be repaired or replaced at no cost to the Owner in a manner conforming with the requirements of this Section.

PART 2 - PRODUCTS

2.01 GENERAL

A. A minimum of three manufacturers is listed below for the primary wood repair and restoration materials. Products of other manufacturers that have proven to be equal or superior in performance to those listed will be considered. For each product type, provide products from one manufacturer. Confirm that the product selected is fully compatible with the project conditions and requirements.

2.02 WOOD REPAIR & REPLACEMENT MATERIALS

A. Wood Repair Products shall be high-performance, non-shrinking, elastic epoxy repair system specifically developed, tested and proven effective for successful use in the preservation and repair of decayed and damaged wood. Acceptable manufacturers and products include:
   1. "Liquid Wood" consolidant/primer and "Wood Epox" structural adhesive compound by Abatron, Inc.; 5501 95th Avenue; Kenosha WI 53144; Tel. (262) 653-2000; www.abatron.com.
   2. "Primatrate" flexible cell-bonding primer and "Flex-Tec HV" elastomeric wood repair compound by Advanced Repair Technology; PO Box 510; Cherry Valley NY 13320; Tel. (607) 264-9040; www.advancedrepair.com.

3. "West Systems" three-component epoxy repair product with resin, hardener and filler by Gougeon Brothers, 102 Patterson Avenue, Bay City MN 48707, Tel. (989) 684-7286; www.westsystem.com.

B. Wood Replacement Products for splicing, dutchmen and replacement window components shall be of an identical wood specie (except as noted) as the original windows on the project. The wood shall have the same profile, grade, cut, hardness & grain structure as the existing window components.
   1. It is assumed that the existing wood used for sash and frames is Eastern White Pine. If possible, utilize old growth wood salvaged from a known source that has identical characteristics to the existing wood. If salvaged wood in good condition cannot be found, the use of clear Swietenia Mahogany with tightly spaced vertical grain will be preferable to the use of new growth pine.
   2. Parting Beads, where extant, shall be clear mahogany; pine shall not be allowed (unless old growth stock). Note that most of the 6-over-6 windows do not have parting beads and that the 2-over-2 parting beads appear to be surface-applied retrofits tacked into place. Replicate existing conditions of parting beads and do not provide receptors in frames where non exist.
   3. Interior stops are assumed to be painted pine; replacement interior stops are to be clear pine or poplar.
   4. All wood shall be kiln-dried to a moisture content of six (6) to twelve (12) percent at the time of fabrication.
   5. Wood shall be free from shakes, large or loose knots and all imperfections which might impair its strength, durability, performance and compatibility with existing components.
   6. Finger-jointed stock shall not be allowed.

2.03 RELATED MATERIALS

A. Weather-stripping: The historic windows generally do not have any weather stripping and none will be provided in the restoration. Refer to Section 08 51 69 – Metal Storm Windows for the provision of low infiltration fully weather stripped exterior storms.

B. Sash Balances: The existing windows do not have pulleys, weights, sash cords or chains. Some have been retrofitted with contemporary spring balances. Several have spring locks in various states of disrepair. A few have cam locks mounted on the interior stops for holding the sash in place when ventilating. The following criteria is established for the restoration:
   1. Where spring balances exist, remove balances and infill sash stile and rail cutouts, restoring the sash to its original condition. Infill can be limited to the top and bottom area of the stiles to the depth of the rails; hollows in the stiles beyond those limits can remain.
   2. Where spring locks exist, remove spring locks and infill sash stiles and corresponding holes in frames, restoring the sash to its original condition.
   3. Remove cam locks and patch holes in stops and any damage in sash.
   4. Provide window hardware as noted below.

C. Window Hardware: The existing windows have a variety of mis-matched hardware including sash locks, lifts and other hardware indicating multi-generational repairs. In general, the sash locks are fitch type sash locks. Existing locks should be inventoried and those that are in serviceable condition should be salvaged and stored on site. Provide hardware as follows:
   1. Sash Locks: One for each single hung sash; Phelps LKF18 with narrow strike.
   2. Sash Lifts: One pair for each single hung sash; Bronze Craft 224 010.
   3. Ventilation Locks: For each single hung sash, provide pair of ventilation locks with three strike plates for each lock; Phelps WSB75.
   4. Cellar Sash: For each unit, provide one transom lock and one pair of bronze chains to limit inswing operation; ARC Lock #80 and Phelps TCH35 chain. Provide pair of solid brass hinges for base rail attachment to sill.
   5. Finish shall be US10B, oil rubbed bronze. Refer to Section 08 71 00 Door Hardware for finishing source if supplier does not provide US10B.

6. Manufacturers are not limited to the manufacturer noted above if equal quality and profiles can be supplied by others, including:
    a. The Architectural Resource Center, PO Box 217, 557 Old Turnpike Road, Northwood NH 03261, Tel: 800-370-8808, Fax: 866-370-0260; www.aresource.com.
    b. Bronze Craft Corporation, 37 Will Street, PO Box 788, Nashua NH 03061-0788, Tel: 800-488-7747, Fax: 603-883-0222; www.bronzecraft.com.
    c. Phelps Company, 60 Elm Street, Brattleboro VT 05301, Tel: 802-257-4314, Fax: 802-258-2270; www.phelpscompany.com.

D. Glass & Glazing shall be as noted in SECTION 08 80 00 GLAZING.
    1. Provide glass in replacement sash and sidelights.
    2. Remove and reuse glass in existing windows that are scheduled to be restored.
    3. Replace existing glass that is missing, broken or becomes broken during work.
    4. Glaze glass into primed glazing rabbet.
E. Paint Removal shall be as noted in SECTION 09 90 00 PAINTING & COATING. Heat-related removal techniques will not be allowed on site.
F. Sealant shall be as noted in SECTION 07 92 00 JOINT SEALANTS.

PART 3 - EXECUTION

3.01 WINDOW WORK DESCRIPTION

A. General: Refer to the Drawings for the configuration and location of all windows.
B. It is the bidder's responsibility to become familiar with the level of repair and restoration treatment needed at each opening prior to submitting a bid.
C. Inspect Surfaces of both the weather and non-weather sides of windows to be repaired. Inspect all surfaces of the wood to determine method and extent of treatment.
    1. Surface areas where wood decay, deformation and deterioration are present require repair and restoration treatment.
    2. Surface areas that do not match their original profiles but are otherwise structurally sound do not require repair.
    3. Areas of major surface and sub-surface damage & deterioration require splicing, dutchmen infill repairs or complete repairs with in-kind materials.
    4. Inspect wood sills for natural defects (knots), cracks and checks. Check for presence of wood decay or soft rot from weathering and UV exposure. Check for concealed deterioration due to water infiltration.
D. Inspect Joints and Edges of all wood members of frame and sash.
    1. Check all joints between wood members for open seams. With moisture meter, measure the wood moisture content level at random locations directly surrounding the joint. Check for presence of wood decay or soft rot from weathering and UV exposure.
    2. Check edges and ends of wood members for presence of wood decay, splits, water damage or soft rot from weathering and UV exposure.
E. Examine the operation and characteristics of the sash and record its fit to the frame. Determine inherent dimensional irregularities that may need to be retained in order to assure a proper fit in the frame following the restoration work. Record all observations.

3.02 REMOVAL OF SASH TO BE REPLACED

A. Remove window sash at locations indicated in the Drawings. Remove any blocking and shims to restore integrity of original window frame opening where replacement sash is noted to be installed.

3.03 REMOVAL OF WINDOWS TO BE RESTORED

A. Remove existing sash in accordance with the approved job sequencing schedule. Remove upper and lower sash at all openings. Number each sash in accordance with the window elevation location index. Coordinate removal with provision of temporary protection in openings. Transport sash off-site for restoration, unless appropriate provisions for on-site work are determined to be acceptable to the Owner and General Contractor. Minor cleaning and repairs may be performed on site.
B. Remove and discard all existing redundant non-original hardware, fasteners, mending plates, nails, non-original weather-stripping, caulking cords, plastic sheeting or panels and any other items made obsolete by the work of this Section. Do not discard existing, original sash locks in good condition.
C. Review condition of all window coverings and related hardware with the Owner prior to removal and store any existing coverings for re-installation if directed to do so. Remove and discard all other window coverings not scheduled for reuse.
D. Remove sash balances and discard.
E. Remove parting beads and discard.
F. Remove paint from window frames to bare wood in area where wood is fissured or deteriorated. Paint removal shall extend at least 2 inches beyond area to be repaired. Remove loose and deteriorated paint to sound earlier coatings in preparation for priming. Sand edges of intact paint layers to feather any sharp layers to adjacent substrate. Remove existing paint from wood-to-wood contact surfaces such as sash tracks. Retain all well-adhered paint in other areas of frame and do not remove except where repairs are needed.
G. Remove paint from window sash to the same extent required for window frames as noted above. All well-adhered paint may be retained or removed at the Contractor's option. Removal of all sash paint will be allowed if its removal will assure a good fit and smooth operation in the restored condition.
H. Remove glazing putty in its entirety.
I. Remove glass and salvage for reuse in same locations. Remove any non-glass sheets where extant.
J. Remove interior stops at jambs and salvage for reuse if in good condition. Do not remove head stops unless deteriorated or if required for other reasons.
K. Where exterior shutter hardware is extant, retain in place.
L. Remove any other items as noted on the Drawings or made redundant by the Work.

3.04 WOOD REPAIR AND RESTORATION

A. Preservation and Sealing of Seams and Joints: Areas which are open are to be further cut open to a depth of 10 mm (3/8-inch) and width of 4 mm (1/8-inch). Remove soft wood, weathered wood and all decayed wood. Check the moisture content and hardness of the wood structure in and around the joint with moisture meter. Continue with repairs when the moisture content is 18% or less. Sand the bare wood, thoroughly remove all loose fibers, paint, saw dust and dirt to a sound and clean substrate.
    1. Pre-treat bare and sanded wood thoroughly with elastic epoxy primer. Follow selected manufacturer's specific primer instructions.
    2. Apply elastic epoxy repair compound in joint with small modeling knife. Epoxy shall have optimal contact with wood. Avoid inclusion of air pockets in epoxy. Seal joint full, even and smooth in a single application. Allow cure time within the range specified by the manufacturer's instructions.
    3. After curing, sand surface even and smooth. Transitions and irregularities between wood and epoxy shall not be visible after sanding. Remove sanding dust thoroughly.
    4. Smooth any remaining irregularities with fast repair compound applied with modeling knife. Sand lightly and remove sanding dust. Apply specified paint system on sash, stops and frames.

B. Repair of Cracks or Checks in Wood: At each end of crack, drill a hole 3/8-inch in diameter and a minimum of 1/8"-inch deep. Cut crack to a depth of 10 mm (3/8-inch) with router and round cutter (10 mm./ 3/8-inch dia.) Remove all decayed wood. Check moisture content and hardness of the wood structure in and around the crack with moisture meter. Continue with repairs when moisture content is less than 18% displayed. Sand the bare wood, thoroughly remove all loose fibers, paint, saw dust and dirt to a sound and clean substrate.
   1. Follow same procedure as described in 3.04/A.1 through 3.04/A.4 listed above.

C. Repair of Natural Defects (Deteriorated Knots): Sound and tight knots that have not contributed to deterioration of surrounding wood may be retained. Cut out defective knots to a depth of 10 mm (3/8-inch) and width of 4 mm (1/8-inch) with a round cutter (10 mm./ 3/8-inch dia.). Remove soft, weathered wood with router and round cutter (10 mm./ 3/8-inch dia.). Remove decayed wood. Check moisture content and hardness of the wood structure in and around the joint with moisture meter. Continue with repairs when moisture content is less than 18%. Sand the bare wood thoroughly to remove all loose fibers, paint, saw dust and dirt to a sound and clean substrate.
   1. Follow same procedure as described in 3.04/A.1 through 3.04/A.4 listed above.

D. Sealing of Bare Sides and End Grain Wood: All surfaces requiring treatment shall be sanded to bare wood. Remove weathered and decayed wood. Check moisture content and hardness of the wood structure in and around the subject area with a moisture meter. Continue with work when moisture content is less than 18%. Sand the bare wood thoroughly remove all loose fibers, paint, saw dust and dirt to a sound and clean substrate.
   1. Pre-treat bare and sanded wood thoroughly with elastic epoxy primer. Follow selected manufacturer's specific primer instructions.
   2. With brush, apply a layer of medium viscosity elastic epoxy to pre-treated wood. Coating thickness shall be +/- .5 mm (1/32-inch).
   3. After curing, sand lightly and remove sanding dust.

E. Restoration of Missing Sections, Damaged Profiles and Highly Deteriorated Areas: Provide replacement sections, wood dutchmen and epoxy fillers in accordance with system manufacturer's recommendations. Rebuild profiles at areas of structural repair in order to restore member integrity. Replace overly eroded or deformed muntins and bars if repairs will be too elastic for improving the overall structural integrity of the wood. Replace severely deteriorated window components in their entirety in lieu of repairs where necessary (sill, blind stops, casing band mouldings, sash track, stool, apron, interior stops, etc.).

F. Disassemble Window Sash when replacement of highly deteriorated or damaged components requires that the sash be disassembled in order to perform the necessary repair and restoration work. Reassemble the sash utilizing the traditional draw-bore technique for joining the stiles and rails. Pins shall be square hardwood pegs in round holes. Holes in tenons shall be offset in alignment so that stile and rail are drawn tightly together upon insertion of the pins.

G. Repair Dropped & Bowed Rails by removing member and restoring mortise and tenon joints if joint failure cannot be corrected using other methods. Drill out pins, remove all nails and mending plates. Replace severely bowed lower rails of upper sash if the bow cannot be corrected. Reassemble sash using draw-bore technique described above.

H. Realign Meeting Rails by removing paint build-up at stiles and rails of both sash. Gradually plane existing wood at bottom rail of lower sash if necessary to provide proper clearances. Check alignment of rails frequently in order to remove no more wood than is necessary. Reshape meeting rails if obstructions exist. Allow clearance for paint finishes and weather stripping so that meeting rails align upon completion of the repairs.

I. Final Sanding & Preparation shall leave surface even and smooth. Transitions and irregularities between wood and epoxy shall not be visible after sanding. For system utilizing consolidants, final appearance of surface should be similar to veined marble

with filler only in the deep recesses and fissures, rather than a continuous coat of filler over the entire surface.

J. Protect Exposed Unfinished Wood Frames from water absorption and adverse affects of weather prior to priming. Provide spot priming on frames at areas of repair. Provide full prime coat on entire exterior frame. Final finish coat painting on exterior frames shall be the responsibility of the Painting Subcontractor. Provide three coats of tinted boiled linseed oil mixed with dark brown stain at wearing surfaces (wood-to-wood contact) in lieu of paint.

K. Paint Window Sash in the shop with one coat of primer and both finish coats in accordance with the requirements of SECTION 09 90 00 PAINTING & COATING. Allow sufficient curing time for glazing compound and epoxy systems prior to painting. Touch-up any damaged finishes at the site following installation. Stain stile edges at wearing surfaces (wood-to-wood contact) and top surface of upper sash top rail in lieu of paint.

L. Re-install Sash in same openings from which they were removed.
   1. Fix upper sash in place. Set in bed of sealant. Provide partial height (4") wood jack below underside of meeting rail full width of track. Prime all six sides of wood jack prior to installation.
   2. Provide replacement parting beads where extant. It is assumed that parting bead receptors do not exist in frames and that all parting beads are surface applied. Attach with stainless steel brads. Pre-finish parting bead with three coats of tinted boiled linseed oil mixed with dark brown stain prior to installation.
   3. Provide replacement interior wood stops at jambs where existing stops were not servicable or were damaged during removal. Shop paint stops primer plus two finish coats as part of the work of this Section. Nail stops in place and set; fill holes to conceal. Paint stops on site to cover puttied nail holes and to touch-up any damaged finishes.
   4. Install and adjust each sash for proper fit. Lubricate concealed edges of stiles with hard soap at wearing surface for smooth operation of sash.
   5. Provide replacement sash locks, lifts and ventilation locks as specified. Fill previous holes and drill new holes of proper diameter to avoid splitting wood.
   6. Refasten any loose portions of exterior casing band moulding. Replace any damaged or deteriorated mouldings. Provide moulding where existing moulding is missing. Install backer rod and sealant at joint between window and siding.

3.05 WOOD WINDOW REPLACEMENT

A. Provide wood window replacement sash, frames and related components as indicated on the Drawings. Replacement components shall match existing profiles and muntin patterns of original or missing windows in every respect. Shop-finish window in its entirety and touch-up finishes following installation. Seal perimeter of window in opening.

B. Replacement windows at double-hung openings shall be true divided-light double-hung, single-glazed wood sash. Replacement units at foundation wall shall operable cellar sash, bottom hinged, inswinging units.

C. Prior to construction, confirm dimensions and details of existing windows and submit shop drawings for review. Match existing profiles and construction methods of original windows, including methods of joinery.

3.06 GLASS AND GLAZING INSTALLATION

A. Remove any broken existing glass and its associated glazing compound. Remove and salvage glass for reuse in units to be restored. Remove all non-glass lights. Inspect the wood near the glazing rabbet for any signs of soft rot or decay. Remove all soft rot and decayed wood. Check moisture content and hardness of the wood structure in and around the glazing rabbet joinery with moisture meter. Continue with the work when the moisture content is less than 18%.

1. Glass and rabbet surfaces must be clean and free of old compound, dirt, moisture, grease, grime and loose wood fibers.
2. Apply primer to all surfaces of glazing rabbet.
3. Apply back bead of elastic glazing compound to the rabbet. Press glass firmly into place avoiding inclusion of air pockets. Apply glazier points.
4. Apply front bead of elastic glazing compound to glass and rabbet.
5. Apply compound to face of glass, filling rabbet completely.
6. Smooth compound with applicator knife to an angle that sheds water and finish inside corners slightly rounded.
7. Remove all excess compound with applicator knife. Remove any cured compound overflow with razor blade; avoid scratching glass. After curing time as recommended by Manufacturer, coat compound and sash with specified primer.

3.07 HARDWARE INSTALLATION

A. Provide hardware and install per manufacturer's instructions. Adjust all hardware for proper alignment and operation.

3.08 SASH OPERATION

A. Install and adjust windows for maximum performance of full range of sash motion. Make any adjustments to tolerances between sash and frame as required for smooth operation and refinish any planed or modified portions.

3.09 PROGRESS REVIEW

A. Observation of sash restoration and repair work, whether performed on site or at an off-site location, shall be made available to the Owner and Architect for the purpose of reviewing the progress of the work.

3.10 FINAL CLEANING

A. Remove excess sealants, dirt, and other substances. Take care to avoid damage to coatings and finishes.
B. Clean interior and exterior surfaces of all windows and sidelights immediately prior to Substantial Completion of the work. Comply with manufacturer's recommendations for final cleaning and maintenance. Use professional window cleaners.
C. Remove and replace glass that has been broken, chipped, cracked, abraded or damaged during the construction period.

END OF SECTION

SECTION 08 52 99 – WOOD WINDOWS & DOORS (PELLA)

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Wood double-hung windows, primed.
   2. Wood French door, primed; low profile threshold.
   3. Clear pine casings and sill projections; primed; not finger jointed.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 06 10 00 Rough Carpentry.
   2. Section 06 20 13 Interior Finish Carpentry.
   3. Section 06 20 23 Exterior Finish Carpentry.
   4. Section 07 27 00 Air Barriers.
   5. Section 07 46 23 Wood Siding.
   6. Section 07 60 00 Sheet Metal Flashing and Trim.
   7. Section 07 92 00 Joint Sealants.
   8. Section 08 71 00 Door Hardware.
   9. Section 09 90 00 Painting & Coating.
B. Work related to window restoration and glazing of existing windows is not part of this Section. Refer to Sections 08 52 00 and 08 80 00 for those portions of the Work.

1.04 REFERENCES

A. Fenestration Standard: Comply with AAMA/WDMA 101/I.S.2/NAFS, "North American Fenestration Standard Voluntary Performance Specification for Windows, Skylights and Glass Doors," for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
   1. Provide WDMA-certified wood windows with an attached label.
B. Glazing Publications: Comply with published recommendations of glass manufacturers and with GANA's "Glazing Manual" unless more stringent requirements are indicated

1.05 PERFORMANCE REQUIREMENTS

A. Hallmark certification rating in accordance with ANSI/AAMA/NWWDA 101/I.S.2 for
   1. Double-hung windows: H-LC
B. Window Unit Air Leakage
   1. For casement and awning windows: ASTM E 283, 1.57 psf (25 mph): 0.05 cfm per square foot of frame or less.

2. For double-hung windows: ASTM E 283, 1.57 psf (25 mph): 0.3 cfm per square foot of frame or less.

C. Window Unit Water Penetration: No water penetration through window unit when tested in accordance with ASTM E 547, under static pressure of 7.5 psf (52 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot.

1.06 WARRANTY

A. Submit manufacturer's standard warranty in which manufacturer agrees to repair or replace wood windows that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure to meet performance requirements.
      b. Structural failures including excessive deflection, water leakage, or air infiltration.
      c. Faulty operation of movable sash and hardware.
      d. Deterioration of wood, metals, vinyl, other materials, and finishes beyond normal weathering.
      e. Failure of insulating glass.
   2. Warranty Period;
      a. Window: Ten years from date of Substantial Completion.
      b. Glass: Twenty years from date of Substantial Completion.
      c. Laminated Glass: Five years from date of Substantial Completion.

B. Warranty Period shall commence from the date of Substantial Completion as determined by the Architect. No other commencement date shall be acceptable.

1.07 SUBMITTALS

A. Comply with Division 1 requirements.
B. Product Data: Submit manufacturer's product data, including installation instructions.
C. Shop Drawings: Submit manufacturer's detailed proposal, indicating dimensions, attributes and unit costs.

1.08 QUALITY ASSURANCE

A. Provide sample installation of one window in the field for review by the Architect and to determine acceptability of window installation methods.
B. Approved mockup shall represent minimum quality required for the Work.
C. Approved mockup shall remain in place within the Work prior to the installation of interior finishes and trim.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.
B. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.
C. Handling: Protect materials and finish during handling and installation to prevent damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Pella Corporation, 102 Main Street, Pella, IA 50219, Toll Free: (800)-54-PELLA, Phone: (641) 521-1000 www.pella.com.

2.02 WOOD WINDOWS

A. Frame:
   1. Select woods, water-repellent, preservative-treated with EnduraGuard in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency three active fungicides and an insecticide applied to the frame.
   2. Interior Exposed Surfaces: Clear pine with no visible fastener holes; clear pine removable jamb liners on double-hung windows.
   3. Exterior Surfaces: Clear pine, primed.
   4. Overall Frame Depth: 4 3/8 + 1 1/8 inches clear pine casings and Pella subsill.
   5. Provide Pella sill nosing extension as detailed.

B. Sash:
   1. Select woods, water-repellent, preservative-treated with EnduraGuard in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency three active fungicides and an insecticide applied to the frame.
   2. Interior Exposed Surfaces: Clear pine with no visible fastener holes.
   3. Exterior Surfaces: Clear pine, primed, not finger jointed.
   4. Corners: Mortised and tenoned, glued and secured with metal fasteners.

C. Weather Stripping:
   1. For double-hung windows:
      a. Water-stop santoprene wrapped foam at head and sill.
      b. Thermal-plastic elastomer bulb with slip coating set into lower sash for tight contact at checkrail.
      c. Vinyl-wrapped foam inserted into jamb liner or jamb liner components to seal to sides of sash.

2.03 GLAZING

A. Float Glass: ASTM C 1036, Quality 1.
   1. Tempered Glass: ASTM C 1048.

B. For double-hung windows, silicone-glazed 5/8-inch dual-seal, clear glass.

C. Integral Light Technology Glazing and Grilles:
   1. Insulating glass contains foam grid between 2 panes of glass.
   2. Non-glare Grid: Adhered to glass.
   3. Room Side Grilles: Solid 7/8-inch wide clear pine.
   4. Exterior Grilles: Solid 7/8-inch wide clear pine to match room side grilles.
   5. Bars shall be adhered to both sides of insulating glass with VHB acrylic adhesive tape and aligned with foam grid.
   6. Finish: Primed exterior surfaces ready for site finishing.

2.04 SCREENS

A. Insect Screens: InView screen, with full screens for double-hung windows.
   1. Compliance: ASTM D 3656 and SMA 1201.
   2. Screen Cloth: Vinyl-coated fiberglass, 18/16 with SMA 1201
   3. Set in aluminum frame fitted to inside of window.
   4. Complete with necessary hardware.
   5. Screen Frame Finish: Baked enamel, standard color to be selected.

2.05 HARDWARE

A. Double-hung window hardware.
   1. Balances: Block-and-tackle balances, attached to frame and connected to sash with polyester cord.
   2. Tilt Hardware: Steady-tilt, self-supporting, tilt-wash feature on lower sash, with linkage arms connecting sash to jamb liner.

3. Locking System: Self-aligning spoon shaped sash lock.
    a. One lock on units with frame width less than 37 inches, and 2 locks on units with frame width of 37 inches or greater.
    b. Lock Finish: Oil-rubbed bronze.

2.06 TOLERANCES

A. Windows shall accommodate the following opening tolerances:
    1. Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.
    2. Width Dimensions: Plus 1/4 inch, minus 0 inch.
    3. Building Columns or Masonry Openings: Plus or minus 1/4 inch from plumb.

2.07 INSTALLATION ACCESSORIES

A. Flashing/Sealant Tape: Pella SmartFlash, aluminum-foil-backed butyl window and door flashing tape.
B. Insulating-Foam Sealant: Dow Great Stuff Window & Door Sealant, low-pressure, polyurethane window and door insulating-foam sealant.
C. Refer to Drawings for installation of copper head flashing (by others).

2.08 SOURCE QUALITY CONTROL

A. Factory Testing: Factory test individual standard operable windows for air infiltration in accordance with ASTM E 283, to ensure compliance with this specification.

2.09 WOOD IN-SWING FRENCH DOORS

A. Architect Series French wood in-swing door.
B. Frame:
    1. Select woods, water-repellent, preservative-treated with EnduraGuard in accordance with WDMA I.S.-4.
    2. Interior Exposed Surfaces: Clear pine.
    3. Exterior Surfaces: Clear pine, primed.
C. Door Panels:
    1. Select woods, water-repellent, preservative-treated in accordance with WDMA I.S.-4.
    2. Exterior Surfaces: Clear pine, primed.
    3. Panel Hinge Stiles and both Rails are three-ply construction, randomly finger-jointed blocks laminated with water-resistant glue and veneered on both sides. Stiles have LVL core with finger-jointed edge bands both sides, veneered both faces. Interior surfaces veneered with pine.
    4. Corners: Silicone sealed and secured with metal fasteners and structural adhesive.
D. Weather stripping
    1. Tri-durometer extruded polymer welded at corners along perimeter of door panels.
E. Glazing:
    1. Float Glass: ASTM C 1048, fully tmepered; urethane-glazed 13/16” dual-seal insulating clear glass, Advanced Low-E coated with argon.
F. Hardware:
    1. Lock: Mortised and keyed multi-point locking system with oil rubbed bronze trim.
    2. Handle: Oil rubbed bronze.
G. Threshold:
    1. Low profile, dark bronze.
H. Grilles:
    1. 7/8” with regular profile: 2 wide by 3 high.
    2. Exterior surfaces: clear pine.
    3. Interior surfaces are clear pine, primed white.

4. Bars are adhered to both sides of the insulating glass with VHB acrylic adhesive tape and aligned with the foam grid.
5. Insulating glass contains foam grid between two panes of glass. Foam grid is adhered to the glass.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive windows and French door. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Installation shall be provided under the Work of Section 06 20 21 Interior Finish Carpentry.
B. Install windows and doors in accordance with manufacturer's instructions and approved shop drawings.
C. Install windows and doors to be weather-tight and freely operating.
D. Maintain alignment with adjacent work.
E. Secure assembly to framed openings, plumb and square, without distortion.
F. Integrate window system and door installation with exterior water-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with window manufacturer's instructions.
G. Place interior seal around window and door perimeter to maintain continuity of building thermal and air barrier using insulating-foam sealant.
H. Seal window and door to exterior wall cladding with sealant and related backing materials at perimeter of assembly.
I. Leave windows and doors closed and locked.

3.03 CLEANING

A. Clean window and door frames and glass in accordance with Division 1 requirements.
B. Do not use harsh cleaning materials or methods that would damage finish.
C. Remove labels and visible markings.

3.04 PROTECTION

A. Protect installed windows and door to ensure that, except for normal weathering, windows and door will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Provide finish hardware for doors and frames.
   2. Modify finish hardware at existing doors and frames.
   3. Patch doors and frames at locations of removed hardware.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition.
   2. Section 06 10 00 Rough Carpentry.
   3. Section 06 20 21 Interior Finish Carpentry.
   4. Section 07 92 00 Joint Sealants.
   5. Section 08 14 00 Wood Doors.
   6. Section 09 90 00 Painting & Coating.

1.04 SUBMITTALS

A. Submit for approval cut sheets, product data and hardware schedule proposed for use based on Owner's requirements.
B. Review all hardware sets listed in this Section with field conditions and associated components prior to submission of shop drawings. Submission of shop drawings and product cuts represents concurrence with all selections listed herein or as revised by further inspection and analysis by the Contractor. The Contractor shall be responsible for assuring that all components specified are compatible with project conditions, with intended function of specifications, with other hardware and with related components.
C. Single manufacturers of hardware items, where listed in this Section, are listed as a means of describing quality standards and design expectations, not to limit competition from other manufacturers. Equivalent products to those specified will be allowed provided that they meet or exceed the quality of items selected.
D. Submit templates for layout of all hardware and devices to the supplier of doors and frames immediately upon receipt of approved hardware shop drawings.

1.05 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Deliver, handle, and store materials in accordance with manufacturer's instructions and requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. GENERAL: The selection and specification of materials shall be a collaborative effort of the Architect, Owner and Subcontractor. Refer to the Hardware Schedule for a summary of intentions for each door opening.
B. FINISH: US-10B, oil-rubbed bronze, assumed finish for initial pricing purposes (may be amended during submittal review). Refer to Part 3 – Execution for refinishing and treatment of existing hardware.

2.02 HARDWARE SETS

A. **SET H0.01: Door No. 0-1**
   1. Provide 1.5 pair of mortise hinges
   2. Provide lockset with knob, entry function
   3. Provide weatherstripping at all sides

B. **SET H0.02: Door No. 0-2**
   1. Manufacturer's standard latchset (no lock)

C. **SET H0.03: Door No. 0-3**
   1. Provide pair of gate-type strap hinges
   2. Provide sliding latch with padlock hasp
   3. Provide gate pull
   4. Provide weatherstripping at door rabbet all sides

D. **SET H0.04: Door No. 0-4**
   1. Provide pair of gate-type strap hinges
   2. Provide sliding latch with padlock hasp
   3. Provide gate pull

E. **SET H1.01: Door No. 1-1**
   1. Clean, lubricate, adjust and refinish existing hardware at primary and storm door

F. **SET H1.02: Door No. 1-2**
   1. Clean, lubricate, adjust and refinish existing hardware at primary and storm door

G. **SET H1.03: Door No. 1-3**
   1. Provided under Section 08 52 99 Wood Windows & Doors (Pella)

H. **SET H1.04: Door No. 1-4**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation
   2. Provide surface mounted slide bolt on pull side
   3. Provide sound seals and door sweep

I. **SET H1.05: Door No. 1-5**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation
   2. Provide surface mounted slide bolt on pull side
   3. Provide sound seals and door sweep

J. **SET H1.06: Door No. 1-6**
   1. Salvage & refinish existing pair of self-closing hinges and single standard hinge
   2. Salvage & refinish existing lockset, deadbolt and sound seals
   3. Remove existing aluminum threshold and restore integrity of wood threshold
   4. Replace existing door sweep with sound seal sweep to wood threshold

K. **SET H1.07: Door No. 1-7**
   1. Salvage & refinish existing pair of self-closing hinges and single standard hinge
   2. Salvage & refinish existing lockset, deadbolt and sound seals
   3. Remove existing aluminum threshold and restore integrity of wood threshold
   4. Replace existing door sweep with sound seal sweep to wood threshold

L. **SET H1.11: Door No. 1-11**
   1. Provide 1.5 pair of hinges
   2. Provide lockset
   3. Provide door stop

M. **SET H1.12: Door No. 1-12**
   1. Provide 1.5 pair of hinges
   2. Provide lockset
   3. Provide door stop

N. **SET H1.13: Door No. 1-13**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation
   2. Provide surface mounted slide bolt on pull side
   3. Provide wall mounted door stop

O. **SET H1.14: Door No. 1-14**
   1. Provide hinges to match hardware set H1.13
   2. Provide lockset to match other similar doors, privacy function or similar

P. **SET H1.15: Door No. 1-15**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation
   2. Remove existing latchset and relocate to hardware set H1.16; provide blank escutcheon plate to cover.
   3. Retain existing strike
   4. Secure door in place and seal

Q. **SET H1.16: Door No. 1-16**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation
   2. Relocate latchset from hardware set H1.15

R. **SET H1.17: Door No. 1-17**
   1. Extent of existing hardware not visible prior to project
   2. Existing hinges assumed to be servicable: clean, adjust, lubricate, & refinish
   3. Provide appropriate latchset (assumed missing)

S. **SET H1.19: Door No. 1-19**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation
   2. Add appropriate latch (interior spring-loaded ball rollers or similar)

T. **SET H1.20: Door No. 1-20**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation: pair of strap hinges (L); pull knob; latch with thumbturn and catch

U. **SET H1.21: Door No. 1-21**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation: pair of hinges; knob set with escutcheons
   2. Add appropriate latch (interior spring-loaded ball rollers or similar)

V. **SET H1.23: Door No. 1-23**
   1. Provide pocket door track and latch/pull with lock (Johnson and Baldwin)

W. **SET H1.24: Door No. 1-24**
   1. Provide hardware to replicate and match hardware set H1.20

X. **SET H2.01: Door No. 2-1**
   1. Provide hinges, knob set and surface mounted strike to match H2.04
   2. Provide surfaced mounted keyed deadbolt with thumbturn
   3. Provide sound seals and door sweep
   4. Provide wall mounted door stop

Y. **SET H2.02: Door No. 2-2**
   1. Salvage & refinish existing pair of self-closing hinges and single standard hinge
   2. Salvage & refinish existing lockset, deadbolt and sound seals
   3. Remove existing aluminum threshold and restore integrity of wood threshold
   4. Replace existing door sweep with sound seal sweep to wood threshold
   5. Provide wall mounted door stop

Z. **SET H2.03: Door No. 2-3**
   1. Provide 1.5 pair mortised hinges with two self-closing and one standard
   2. Provide knob set, passage function
   3. Magnetic hold open device provided under Section 26 00 00 Electrical

AA. **SET H2.04: Door No. 2-4**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation: hinges; knob set with surface mounted strike
   2. Provide surfaced mounted keyed deadbolt with thumbturn
   3. Provide sound seals and door sweep
   4. Provide wall mounted door stop

BB. **SET H2.05: Door No. 2-5**
   1. Clean, lubricate, adjust and refinish existing hardware for smooth operation: pair of 2.25 x 1.5 hinges; pull ring; gate latch (currently inoperable); cabin hook & eye
   2. Provide appropriate lock for securement of attic space

CC. **SET H2.06: Door No. 2-6**
   1. Salvage & refinish existing pair of self-closing hinges and single standard hinge
   2. Salvage & refinish existing lockset, deadbolt and sound seals
   3. Remove existing aluminum threshold and restore integrity of wood threshold
   4. Replace existing door sweep with sound seal sweep to wood threshold
   5. Provide wall mounted door stop

DD. **SET H2.07: Door No. 2-7**
   1. Salvage and refinish existing pair of ball finial hinges
   2. Remove former latchset remnants and keyed escutcheon unless its preservation does not conflict with hardware noted below
   3. Provide electric strike and lockset, activated (unlocked) by fire alarm system
   4. Provide sound seals and door sweep
   5. Provide surface mounted spring closer on push side door stile and frame

EE. **SET H2.08: Door No. 2-8**
   1. Salvage and refinish existing pair of surface-mounted strap hinges
   2. Remove existing padlock hasp, rotary turn catch and surface thumb latch
   3. Provide electric strike and lockset, activated (unlocked) by fire alarm system
   4. Provide sound seals and door sweep
   5. Provide surface mounted spring closer on push side door stile and frame

FF. **SET H2.09: Door No. 2-9**
1. Replicate missing door hinges and latchset
2. Provide electric strike and lockset, activated (unlocked) by fire alarm system
3. Provide sound seals and door sweep
4. Provide surface mounted spring closer on push side door stile and frame

GG. **SET H2.10: Door No. 2-10**
1. Extent of existing hardware not visible prior to project
2. Existing hinges assumed to be servicable: clean, adjust, lubricate, & refinish
3. Provide electric strike and lockset, activated (unlocked) by fire alarm system
4. Provide sound seals and door sweep
5. Provide surface mounted spring closer on push side door stile and frame

HH. **SET H2.11: Door No. 2-11**
1. Provide 1.5 pair mortised hinges
2. Provide lockset, privacy function
3. Provide sound seals and door sweep
4. Provide wall mounted door stop

II. **SET H2.12: Door No. 2-12**
1. Salvage, clean, lubricate, adjust and refinish existing hardware for smooth operation in revised location: pair of strap hinges (L); pull knob
2. Add appropriate latch (interior spring-loaded ball rollers or similar)

JJ. **SET H2.13: Door No. 2-13**
1. Clean, lubricate, adjust and refinish existing hardware for smooth operation

KK. **SET H2.14: Door No. 2-14**
1. Clean, lubricate, adjust and refinish existing hardware for smooth operation

LL. **SET H2.15: Door No. 2-15**
1. Retain existing hinges
2. Remove lockset and provide blank escutcheons to cover
3. Retain existing strike
4. Secure door in place and seal

PART 3- EXECUTION

3.01 INSTALLATION

A. Follow guidelines of DHI "Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames" and hardware manufacturers' instructions.
B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
C. Salvage existing hardware where noted in the Hardware Schedule.
D. At existing hardware to be salvaged and reused, clean the hardware, lubricate and adjust for proper and smoooth operation. If existing hardware is painted, remove paint and refinish with paint. If existing hardware has a tarnished brass finish, clean and polish if existing finish can be restored to a semblance of its original luster.
E. If existing hardware finish is damaged and luster cannot be restored, strip existing finish and provide finish to match project requirements. Refinishing shall be performed by Period Hardware, 123 Charles Street, Boston, MA – or approved equal.
F. Provide replacement fasteners to match existing where existing fasteners are damaged and cannot be effectively reused.

G. At existing knob, latch and locksets to be reused, disassemble to clean and lubricate. Replace springs and any overly worn parts as needed. Restore to smooth operation.
H. At existing doors and frames to be reused, remove redundant and abandoned hardware. Patch holes and voids with appropriate fillers and solid infills as needed. Sand or grind smooth to align patched areas flush with adjacent materials.
I. Pre-fit hardware to doors and frames prior to the installation of finishes. Remove hardware for installation of finishes by others. Reinstall hardware upon completion of finishes, taking special precautions to avoid the damage of finished items. Adjust operation, clean and protect all hardware components until substantial completion.

END OF SECTION

SECTION 08 80 00 – GLAZING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not necessarily limited to the following:
   1. Glass and glazing in wood windows per restoration and replication specifications in Section 08 52 00 – Wood Windows.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition.
   2. Section 08 52 00 Wood Windows (Restoration).
   3. Section 09 90 00 Painting and Coating.
B. Glazing for storm windows and Pella windows and doors will not be provided by this Section. Refer to Sections 08 51 69 and 08 52 99 for those components of the Work.

1.04 SUBMITTALS

A. Submit for approval product data.
B. Submit certification that glass conforms to the required safety standards for their particular locations on the project, including but not limited to, fire resistance ratings and hazardous locations as applicable.

1.05 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Demonstrate that the products proposed are in conformance with applicable provisions of the International Building Code.
B. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Glass Materials for Wood Windows: 3/32” standard light restoration glass by Bendheim Restoration Glass or approved equal. Glass salvaged from similar period buildings will be allowed as a suitable substitute if in good condition. Provide glass in locations and configurations as noted on the Drawings.

B. In replicated sidelights at entrance door to 130 Pleasant Street, provide 5/32" laminated light restoration glass by Bendheim Restoration Glass, or approved equal.
C. Glazing Materials: DAP 33 knife-grade, ready-to-use glazing compound, white; blend of soya, polymerized linseed oil and mineral oils; low VOC content of 0.1 lbs. per gallon (10.7 grams/liter).
D. Metal Glazier points.
E. Wood Glazing Stops: none.

PART 3- EXECUTION

3.01 INSTALLATION

A. Examine substrates, supports and conditions prior to installation. Report any unsatisfactory conditions that may result in damage to the Work of this Section to the General Contractor. Do not proceed with Work until conditions are satisfactory.
B. Comply with FGMA "Glazing Manual" and manufacturers instructions and recommendations. Use manufacturer's recommended spacers, blocks, primers, sealers, gaskets and accessories.
C. Install glass with uniformity of pattern, draw, bow and roller marks. Replace any glass with cracks, edge damage or other unintentional imperfections.
D. Prior to installation of glazing, prime wood rabbet to fully coat all surfaces of raw wood. Allow primer to dry.
E. Install thin layer of glazing in continuous back bed around entire perimeter of glazing rabbet. Prevent glass from coming into direct contact with surrounding frame or door materials. Install glazier points as needed.
F. Install glazing bed chamfered to an approximate 45-degree angle or as needed to align with outside corners of rabbet. Make full contact with glass and adjacent rabbet and tool to a smooth finish. Ease corners to a slightly rounded profile.
G. Clean all surfaces of glass upon installation. Remove any excess visible sealant from perimeter of frame and stop.
H. Do not allow painting of glazing compound prior to skinning over and achieving a firm set in accordance with manufacturer's instructions.
I. Protect the Work of this Section until Substantial Completion of the Project.
J. Repair any damaged glass.
K. Remove temporary protection and provide final cleaning of glass within one week after Substantial Completion.
L. Remove spillage from adjoining work and protect all work from damage.
M. Correct and refinish any work not found to be deficient until after paint has been applied and irregular surfaces become evident.

END OF SECTION

SECTION 09 26 13 - GYPSUM VENEER PLASTERING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table Of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Gypsum wallboard at walls, ceilings, soffits and portions thereof to the extent indicated in the Drawings.
   2. Acoustical and fire-resistant sealants.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 06 10 00 Rough Carpentry.
   2. Section 06 20 23 Interior Finish Carpentry.
   3. Section 07 21 00 Thermal Insulation.
   4. Section 07 92 00 Joint Sealants.
   5. Section 09 90 00 Painting & Coating.
   6. Section 22 00 00 Plumbing.
   7. Section 23 00 00 HVAC.
   8. Section 26 00 00 Electrical.

1.04 REFERENCE STANDARDS

A. ASTM C28, Specification for Gypsum Plasters
B. ASTM C37, Specification for Gypsum Lath
C. ASTM C842, Specification for Application of Interior Gypsum Plaster
D. ASTM C587, Specification for Gypsum Veneer Plaster
E. ASTM C1396, Specification for Gypsum Board

1.05 SUBMITTALS

A. Submit for approval product data for each application.

1.06 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
B. Tolerances: Not more than 1/16" difference in true plane at joints between adjacent boards before finishing. After finishing, joints shall be not be visible. Not more than 1/8" in 10'-0” deviation from true plane, plumb, level and proper relation to adjacent surfaces in finished work.

C. Fire resistance: Provide fire-rated assemblies where required with ratings as determined by ASTM E 119.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Veneer Plaster and Gypsum Wallboard
   1. National Gypsum Co., 2001 Rexford Road, Charlotte, NC 28211; 704-365-7300; www.nationalgypsum.com, or approved equal.
B. Bullnose Corner Beads and Accessories
   1. United States Gypsum Company, 125 South Franklin Street, Chicago IL 60606; 800-USG-4YOU, www.usg.com.

2.02 MATERIALS

A. Veneer plaster base at walls and ceilings: Gold Bond Kal-Kore Regular, ½" thick, plain back.
B. One-coat gypsum plaster: Gold Bond Uni-Kal Veneer Plaster.
C. Joint reinforcing tape: Gold Bond Kal-Mesh; *Do not use self-adhering mesh.*
D. Corner bead: Gold Bond Expanded Veneer Corner Bead.
E. Casing bead: Gold Bond Veneer J Trim Casing Bead (use where edges of gypsum board panels abut wood trim, steel angles, or sheet metal roof hatch curbs).
F. Bullnose Corner Bead: USG Softline metal ¾" bullnose outside corner, tape-on bead (SLOC).
G. Fasteners: ASTM C 514 and ASTM C 646. Provide Type S bugle head screws at interior, cadmium plated at humid areas. Provide additional anchors and fasteners as required.
H. Gypsum Board Walls, Ceilings and Soffits: ASTM C36 1/2" thick; regular, moisture-resistant and fire-resistant types as required by location; U.S. Gypsum or equal.

PART 3 - EXECUTION

3.01 INSTALLATION OF GYPSUM WALLBOARD

A. Comply with ASTM C 840 and GA 216 - Recommended Specifications for the Application and Finishing of Gypsum Board. Provide fire-rated systems where indicated and where required by authorities having jurisdiction.
B. Install framing systems in accordance with industry standards and manufacturer's recommendations. Securely fasten and brace framing to limit deflection in finished wall and ceiling assemblies to a maximum of L/360. Coordinate installation of framed openings and all concealed blocking for equipment supports prior to installation of gypsum board.
C. Provide gypsum wallboard in limited areas where indicated on the Drawings. Follow manufacturer's printed guidelines for installation and finishing.
D. Install all boards with 1/4"–3/8" gap between edge of drywall and adjacent construction. This shall apply wherever drywall systems abut existing construction. Seal joints with acoustical or fire-retardant sealant as required for the partition systems.
E. Install boards vertically or horizontally so that tapered edges abut one another at the joints. Do not allow non-tapered butt-to-butt joints and joints that do not fall over framing members.
F. Provide acoustical and fire-resistant sealant at both faces at top and bottom edges, piping & conduit penetrations, duct openings, expansion and control joints and the

like. Provide fire stop systems where required by the rating of the partition or ceiling system.

G. At ceilings and walls where gypsum wallboard is indicated, install tape and joint compound with 3-coat treatment in strict compliance with manufacturer's instructions and recommendations. Joint treatment is required at all fasteners and edges between boards. Completely embed and cover joint tape. Fill all surface defects. Sand between and after joint treatment coatings. Eliminate any chatter marks, uneven areas, bowed or otherwise distorted finishes.
   In unoccupied spaces where “fire tape” treatment is indicated, provide two-coat system instead of a three-coat system, sanding after each coat. Leave ready for paint and for installation of metal hangers, unistrut and equipment.
H. Do not proceed with work if the environmental conditions are not within the limits prescribed by the manufacturer. Work in areas that are well lit in order to provide careful observation of acceptable tolerances so that a quality finished appearance can be achieved.
I. Cut neatly at all corners, edges and around all piping, conduit, devices, ductwork and other penetrations. Fill voids and finish smooth with adjacent surfaces. Re-finish any high or uneven spots that do not allow device plates to fit flush to surface of wall at plate perimeter.
J. Remove spillage from adjoining work and protect all work from damage. Correct and refinish any work that is not found to be deficient until after paint has been applied, devices have been installed and irregular surfaces or voids become evident.

3.02 INSTALLATION OF VENEER PLASTER

A. Apply gypsum base and plaster according to manufacturer’s recommendations. Note in particular the following:
   1. Apply gypsum panels first to the ceiling, at right angles to the framing members. Then apply panels to the walls. Minimize the number of end joints by using boards of the maximum practical length. Bring the edges of the boards into contact with one another but do not force boards into place.
   2. Locate joints so that no end joint aligns with the edges of a wall opening. Stagger end joints and place joints on opposite sides of partitions on different studs.
   3. Fasten using screws spaced 12" o.c. max. at ceilings, 16" o.c. max. at walls and partitions. Hold panels in firm contact with the framing while driving fasteners. Begin fastening at the center part of the panel. Drive screws straight and dimple the surface without breaking the paper face.
   4. At wall-ceiling joints, use the floating interior angle system: Apply gypsum panels to ceilings first. Omit screws in the ceiling within 7” of the wall, and omit screws in the wall within 8” of the ceiling. Apply gypsum panels on the walls so that they maintain a firm, level support for the floating edges of the ceiling panels.
B. Joint treatment:
   1. Pre-treat all joints and fasteners with Uni-Kal; *do not use either setting or drying type joint compounds*. Over all joints and interior angles, center and secure Kal-Mesh with staples spaced 24” apart as follows:
   2. Joints: at alternate edges for the run from end to end and directly opposite one another at either end
   3. Angles: along ceiling edge only for wall-to-ceiling angles; along one edge for wall-to-wall angles
   4. After placing the first staples at the end of a joint or angle, pull unstapled Kal-Mesh as stapling proceeds to assure that it will lie flat.
   5. Pre-treat all joints and beads with Uni-Kal. Tightly trowel over joint line in both directions to prevent voids, feathering to a maximum width of about 6”.
   6. Allow the treated joints to set prior to general plaster application.
C. Plastering
   1. Take care to prevent dryouts; avoid direct exposure to concentrated sources of heat and to drafts. Bring all construction areas and materials to a suitable temperature equilibrium before, during, and after installing the gypsum veneer

plaster system. During cold weather, maintain a temperature of at least 55°F before, during, and after installation of all system components until building is occupied.

2. One-coat smooth plaster finish (for all walls and ceilings):
3. Tightly scratch Uni-Kal into previously treated joints and corner beads, then immediately scratch-in tightly over the wall and/or ceiling area.
4. Double back over the area just toweled with material from the same batch, bringing the total thickness up to 3/32” minimum.
5. Begin finish toweling at time of initial set, using water sparingly. Final toweling must be accomplished before complete set occurs.

END OF SECTION

SECTION 09 28 13 – CEMENTITIOUS BACKING BOARDS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Cementitious backing board for tiled floors at Bathroom 102, Bath 205 and Kitchen 115.
   2. Cementitious backing board for tiled floor, walls and ceiling of shower in Bathroom 102.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 07 92 00 Joint Sealants.
   2. Section 09 30 00 Tiling.
   3. Section 10 28 16 Bathroom Accessories.
   4. Section 22 00 00 Plumbing.
   5. Section 23 00 00 HVAC.

1.04 REFERENCES

A. Tile Council of North America (TCNA) *2009 Handbook for Ceramic Tile Installation*. Refer to Section 09 30 00 Tling for the specified TCNA method for each location.

1.05 PROJECT COORDINATION MEETING

A. Review the work of this Section on site with the Architect and Contractor prior to beginning.

1.06 QUALITY ASSURANCE

A. Do not begin waterproofing installation until the Architect has approved the installed substrate. Conduct a water test after completion of the waterproofing membrane applications. Allow at least 72 hours of curing time between applying the final coat of membrane and the test.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Tile backing board: United States Gypsum Co. (USG), Chicago, IL; 800-874-4968; www.usg.com.

B. Waterproofing Membrane: Laticrete International, Inc., 299 Industry Drive, Hamlet NC 28345-7324, 910-582-2252, fax**:** 910-582-8417 or Hydroment / Bostik, Boston St., Middleton, MA 01949; 800-726-7845; www.bostik-us.com.

2.02 PRODUCTS

A. Tile Backing Board: 1/2" USG Durock Cement Board, or equal.
B. Joint reinforcement: Durock Interior glass-fiber tape.
C. Cement Mortar for Shower Receptor: See Section 09 30 00 Tiling.
D. Fasteners: Durock Wood Screws with flat wafer head capable of being driven flush to surface of tile backing board; 1¼" long; do not use nails, staples, or drywall screws.
E. Waterproofing Membrane: Laticrete Hydro Ban (with 9235 reinforcing fabric for gaps greater than 1/8") or Bostix / Hydroment GoldPlus.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Carefully examine framing before applying tile backing board. Report any discrepancies to the Architect, in writing.
B. Framing must be dead level, plumb, square, true and accurately positioned.
C. Verify that framing in shower receptor area has been recessed and reinforced to receive finished flush application with adjacent floor and slope down to drain.

3.02 INSTALLATION

A. Apply tile backing boards to framing with long dimension parallel to or across framing.
B. Fit ends and edges closely but not forced together.
C. Center end or edge joints on framing and stagger joints in adjacent rows.
D. Locate screws at least 3/8" from edges of board, spaced 8" o.c.
E. Refer to Manufacturer's written instructions and follow all recommendations for proper secure installation.

3.03 WATERPROOFING MEMBRANE APPLICATION

A. Ambient temperature must be above 50°F. Surfaces must be structurally sound, clean, dry, and free of contaminants that may interfere with proper bond. Pack gaps around pipes or other penetrations with compressible backing rod and a suitable flexible urethane or silicone sealant. Flash around pipes with the fluid-applied waterproofing membrane and reinforcing fabric.
B. Stir liquid according to manufacturer's instructions.
C. Waterproofing Application: Follow manufacturer's instructions.
    1. Pre-treat all edges, corners, coves and board joints, covering a minimum 6" on either side with a heavy coat, using a brush, roller or 3/16" V-notch trowel.
    2. After pre-treatment of coves, corners and cracks, apply a continuous film at 20-30 mils (thickness of a drivers license) over the remaining area. Allow it to dry per manufacturer's recommendations.
    3. Once the first coat is dry, apply a second coat at the same thickness.
    4. Allow the second coat to dry for per the manufacturer's recommendations or until the membrane is dry and no longer tacky.
    5. Membrane requires 1-3 hours drying time depending on temperature and humidity before installing tile or applying the 2nd coat. Allow 72 hours before exposing the installation to moisture or prior to conducting a water test.

END OF SECTION

SECTION 09 30 00 - TILING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Ceramic tile floor at Bathroom 102.
   2. Ceramic tile shower receptor (over copper pan), shower walls and shower ceiling at Bathroom 102.
   3. Ceramic tile floor at Kitchen 115.
   4. Ceramic tile floor at Bath 205.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 01 23 00 Alternates
   2. Section 06 10 00 Rough Carpentry.
   3. Section 06 20 23 Interior Finish Carpentry.
   4. Section 06 41 00 Architectural Wood Casework.
   5. Section 07 92 00 Joint Sealants.
   6. Section 09 26 13 Gypsum Veneer Plaster.
   7. Section 09 28 13 Cementitious Backing Boards.
   8. Section 09 64 00 Wood Flooring.
   9. Section 10 28 16 Bath Accessories.
   10. Section 11 31 13 Residential Kitchen Appliances.
   11. Section 22 00 00 Plumbing.
   12. Section 23 00 00 HVAC.
   13. Section 26 00 00 Electrical.

1.04 REFERENCES

A. Tile Council of North America (TCNA) *2009 Handbook for Ceramic Tile Installation*.
B. ANSI or ASTM specifications as stated by TCNA for the materials to be used in each application.

1.05 PROJECT COORDINATION MEETING

A. Review the work of this Section on site with the Architect and Contractor prior to commencement.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Ceramic tile: to be selected by the Owner.
B. Waterproofing membrane materials: Refer to Section 09 28 13 Cementitious Backing Boards. Refer to Products below for copper shower pan.
C. Thin-set materials: Bostik / Hydroment, Boston St., Middleton, MA 01949; 800-726-7845; www.bostik-us.com.
D. Grout materials: Laticrete International, Inc., 299 Industry Drive, Hamlet NC 28345-7324, 910-582-2252, fax**:** 910-582-8417 or Bostik / Hydroment, Boston St., Middleton, MA 01949; 800-726-7845; www.bostik-us.com
E. Sealers and coatings: Miracle Sealants Co., 12318 Lower Azusa Road, Arcadia, California 91006; 800-350-1901; www.miraclesealants.com.

2.02 PRODUCTS

A. Ceramic Tile: to be selected by Owner.
B. Setting Materials:
    1. Mortar Bed at shower receptor: Portland cement with latex additive; THICK-SET: 1.5" minimum thickness unless indicated otherwise.
        a. Portland Cement: ASTM C150, Type I, from one source only, non-staining and non-air- entraining.
        b. Mortar Sand: ASTM C144, free of deleterious materials, well-graded.
        c. Setting Bed Sand: ASTM C136, 100 percent passing No. 4 sieve.
        d. Latex Additive:
            i. Description: Latex additive serving as replacement for gauging water, for use with site-mixed Portland cement mortar.
            ii. Quantity: As recommended by latex additive manufacturer to produce workable consistency.
            iii. Acceptable Products; basis of design: Tile Council of North America (TCNA) *2009 Handbook for Ceramic Tile Installation*.
        e. Fiber reinforcing in lieu of metal lath.
    2. Cementatious Backing Board: as specified in Section 09 28 13.
    3. Tile Thin-set Material: Hydroment Single-Flex #716 (white).
    4. Waterproofing:
        a. Shower pan liner: 20 oz. copper with soldered joints; use fiber reinforced mortar bed in lieu of galvanized steel wire mesh.
        b. Waterproofing Membrane at shower floor, walls and ceiling: Laticrete Hydro Ban (with 9235 reinforcing fabric for gaps greater than 1/8") or Bostix Hydroment GoldPlus. Refer to Section 09 28 13.
C. Grout for floors and walls: Laticrete PermaColor Grout or Hydroment TruColor Premixed Grout.
D. Sealant for flexible joints in shower at intersections of receptor-to-wall, wall-to-wall and wall-to-ceiling: colored urethane.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Inspect condition and integrity of all substrate materials prior to commencement of work. Report any discrepancies to the Architect, in writing.
B. Before installing tile at shower, verify that the waterproofing membrane has been water tested by the Contractor and approved by the Architect.
C. Verify that existing floor framing has been adequately reinforced in order to comply with minimum floor loading, deflection and joist spacing requirements of the Tile Council of North America for the types of installation methods specified.

3.02 INSTALLATION

A. Surface preparation:
   1. Verify that backing board panels are properly fastened to framing, plumb, and true. Panels should not be tightly butted or tented.
   2. Pack gaps around pipes or other penetrations with compressible backing rod and a suitable flexible urethane or silicone sealant.
   3. Surfaces must be structurally sound, clean, dry, and free of contaminants that may interfere with proper bond.
   4. Confirm that the tile flooring level in the Kitchen will match the finished height of wood flooring in the Den with an eased transition or beveled strip. Confirm that the recessed shower pan will allow for a smooth, accessible transition from the adjacent tile bathroom floor.

B. Temperature: Substrate and ambient temperature must be between 40°F and 95°F. Allow for extended periods of cure time when temperature is below 60° and/or when relative humidity is greater than 70%.

C. Tile Council of North America (TCNA) *2009 Handbook for Ceramic Tile Installation*:
   1. For ceramic tile floor, walls and ceiling at shower in Bathroom 102:
      a. Shower Receptor: TCNA Method B415-09, reinforced mortar bed over copper pan with fluid-applied waterproofing membrane.
      b. Shower Walls: TCNA Method W244C-09, *Cementitious Backer Unit*, with fluid-applied waterproofing membrane.
      c. Shower Ceiling: TCNA Method C315-09, *Cementitious Backer Board Ceiling*, with fluid-applied waterproofing membrane.
   2. For ceramic tile floors at Bathroom 102, Kitchen 115 and Bath 205: TCNA Method F144-09, *Cementitious Backer Unit*.

D. Thin-set application: Follow manufacturer's instructions for mixing and application.

3.03 GROUTING

A. Follow manufacturer's instructions for mixing, application, and cleaning.

3.04 SEALING

A. Follow manufacturer's instructions.

END OF SECTION

SECTION 09 64 00 – WOOD FLOORING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not necessarily limited to the following:
   1. Repair existing previously painted historic wood flooring and thresholds. Note that existing wood flooring will be refinished and painted under Section 09 90 00 Paintings and Coatings. This includes historic wood floors that are currently finished with a clear finish instead of a painted finish (remnants are visible).
   2. Provide ash flooring in the Den area of the Ell.
   3. Prepare floor register and floor outlet openings in existing and new wood flooring.
   4. Miscellaneous work as noted on the Drawings or required for a complete project.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 02 41 00 Demolition.
   2. Section 06 10 00 Rough Carpentry.
   3. Section 06 20 23 Interior Finish Carpentry.
   4. Section 06 41 00 Architectural Wood Cabinets.
   5. Section 09 90 00 Paintings & Coatings
   6. Section 22 00 00 Plumbing.
   7. Section 23 00 00 HVAC.
   8. Section 26 00 00 Electrical.

1.04 SUBMITTALS

A. General: Refer to SECTION 01 30 00 – SUBMITTAL PROCEDURES for submittal provisions and procedures as applicable for the work of this Section. Provide samples of wood flooring.
B. Provide a range of sample stain colors on approved wood flooring for review.
C. Product Data: Submit complete product data sheets and recommendations for preparation, application and curing. Products shall comply with all applicable regulations, including compliance with VOC requirements.
D. Qualifications & Experience: Project experience of company and personnel performing the work under this Section shall demonstrate at least five (5) years experience with similar work as that required. If requested by Architect, submit project list and current phone numbers of references.
E. MOCK-UP: Prepare a mockup of the wood flooring and finishing in the Den prior to installation of the cabinets and prior to any other wood flooring installation and finishing. Provide specified number of coats of the specified finish.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver finishing materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.
B. Store finishing materials in designated areas only and in compliance with the manufacturer's requirements for ventilation, and temperature ranges and other conditions. Keep finishing materials in tightly closed containers and away from open flames.
C. Discard and remove from the job site any materials damaged in handling and storage and any materials that have been subjected to conditions contrary to manufacturer's recommendations.
D. Store wood flooring in dry, level and conditioned space within the building.

1.06 PROJECT CONDITIONS

A. When project site conditions are satisfactory, deliver flooring materials, separate into small lots and store in the rooms where it will be installed. Allow 4 to 5 days for the flooring to become acclimated to the site conditions. If flooring is packaged, open or remove packaging for acclimation.
B. From the time flooring is delivered and until occupancy, temperature and humidity should be maintained at or near occupancy levels. After occupancy, continue to control the environment. Extended times (more than 1 month) without HVAC controls can promote elevated moisture conditions which can adversely affect flooring.
C. Examine substrate to determine its satisfactory condition prior to the installation of products specified in this Section.
D. Wood flooring may only be installed when moisture content is between 8-12% and materials have acclimatized in the building for at least 48 hours.
E. Finish may only be applied to surfaces when air, surface and material temperature and moisture content are within the range approved by the manufacturers.
F. Scheduling & Coordination: Coordinate the Work of this Section with the Work of other Sections and with the schedule for completion of various areas as determined by the Contractor.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide first-class quality products for all systems by manufacturers noted, or approved equal.
B. For repairs to existing, historic wood flooring, provide materials to match existing 7/8" minimum thick random width wide board pine flooring. Wood for infill and repairs shall match existing specie, grain pattern, hardness, color, profiles, dimensions and exhibit similar cut and growth rings per inch.
C. Ash flooring for Ell Den shall be nominal 1" x 4" tongue and groove select or better grade per NOFMA grading criteria.
D. For finishing of ash flooring, utilize DURA SEAL "Penetrating Finish" semi-transparent stain and sealer (http://duraseal.com) with soft, satin sheen or an approved equal in a penetrating sealer designed specifically for long-term finishing and protection of wood flooring in a commercial environment. Stain color of sealer shall be selected by Architect from manufacturer's standard and field samples.

PART 3 - EXECUTION

3.01 REPAIRS & INFILL OF HISTORIC FLOORING

A. Inspect conditions of existing flooring and examine areas with large gaps, holes, damage or deterioration.
B. Observe areas where cast iron radiators and associated wood or metal bases or plinths have been removed. Observe conditions formerly concealed by carpet or vinyl flooring.
C. Determine scope of recommended repair work and review with Architect prior to commencement of any infill or repair.
D. Perform repairs with matching materials in order to preserve the historic fabric and patina of surfaces, dimensions, profiles and levels.
E. Provide thresholds at all new, widened or modified openings with materials and profiles to match existing while providing for handicap accessibility with a maximum rise of one-half inch and a maximum slope at the transition of 1:2.
F. Carefully reshape and taper existing thresholds to provide an accessible route between the Kitchen and Den of the Ell to all First Floor rooms except the following: Emergency Exit 104, Closet 105, Closet 110, Office Entry 111, and the threshold at doorway opening 1-13 between Bedroom 101 and Bathroom 102. Re-set nails as needed after reshaping. Provide smooth, continuous transition to original profile at door jambs.
G. In areas where partitions are removed and adjacent rooms contain historic wood flooring (e.g., Hall 106 and Passage 113), demarcate former historic partition locations by infilling their locations with flush wood.
H. Re-nail existing loose flooring with cut nails to match existing, pre-drilling prior to nailing in order to eliminate the possibility of splitting the wood.
I. If existing gaps between boards exceed ¼", infill gaps with matching wood strips tightly fitted and glued into place against one of the two boards and not both, fastening intermittently with countersunk stainless steel brads.
J. Historic wood floors shall be painted under Section 09 90 00 – Painting & Coating.

3.02 INSPECTION & PREPARATION FOR ASH FLOORING

A. Inspect surfaces to be installed, repaired and refinished. Report any unsatisfactory conditions that are the result of the work of other Sections in writing to the General Contractor.
B. Confirm compatibility of specified finishing system with existing materials and finishes. Notify General Contractor in writing of any discrepancy.
C. Remove any damaged or defective wood and replace with wood to match adjacent materials. Stagger joints and provide tight abutment to adjacent flooring components. Conceal fasteners where possible and countersink any unavoidable surface-applied fasteners.
D. Inspect the floor carefully - tighten any loose boards by face nailing with 6d to 8d flooring nails. Look for protruding nail heads or nails not driven down below the wood's surface; pull them out or counter-sink them with a nail set. Remove any staples or other foreign materials.
E. Completely mask or otherwise protect areas adjacent to surfaces to be finished. Remove, mask or protect installed items that are attached to or in contact with surfaces to be finished. Sweep the floor clean immediately before sanding.
F. Coordinate timing of wood installation and finishing at MOCK-UP to proceeed installation of Den bookshelves and of Kitchen cabinets and appliances.

G. Invite the regional Manufacturer's Representative of Duraseal to attend a conference with the Architect, Owner, General Contractor and Flooring Subcontractor prior to the application of finish on the MOCK-UP. Contact Steve Bewsher at 508-813-6429.

3.03 INSTALLATION OF ASH FLOORING

A. Comply with the flooring manufacturer's written installation instructions and NOFMA/WFI Technical Services Bulletin "Installing Hardwood Flooring" published by the Wood Flooring Manufacturer's Association.
B. Cover prepared and verified subfloor with manufacturer's recommended building paper, appropriate for the location and installation. Lap sheets 2" minimum to 4" maximum along edge seams.
C. Review direction of flooring with Architect prior to layout and installation.
D. Begin flooring installation along the longest continuous wall parallel to the flooring direction, working from that reference plane into the room.
E. Hold perimeter strip 3/8" away from perimeter walls. Wood baseboard by others will be provided above the wood flooring.
F. Use a slip-tongue to reverse direction and complete the installation of a room. Glue and blind nail the slip tongue.
G. At butt joints between boards, provide tongue and groove engagement with a factory edge or slip-tongue.
H. At changes of orientation, provide tongue and groove engagement with a factory edge or slip-tongue. Basket weave changes in direction – do not miter joints except at trim surrounds of floor registers.
I. Blind nail with 8d flooring nails at 10" on center.
J. If face nailing is necessary in any location, pre-drill pilot hole part way through the wood in a smaller diameter than the nail. Set nail head and fill divot.
K. Lay out several rows of flooring end to end in a staggered pattern with end joints at least 6" apart. Find or cut pieces to fit within 3/8" of end walls. Layout pattern for even distribution of long and short pieces and to avoid clusters of short boards. Evenly distribute varied grain patterns throughout the floor area to avoid clusters of like-patterned boards.

3.04 SANDING & FINISHING OF ASH FLOORING

A. Utilize drum sander, edger, scraper and hand sander in the direction of the grain. Begin with coarse open coat paper to prepare newly installed flooring and to remove previous finishes from existing floor. Sand floor level and smooth with first cut.
B. Proceed with medium and fine grit papers for subsequent cuts. Prior to fine grit cut, fill all holes, blemishes, cracks and imperfections with wood filler recommended by manufacturer of sealer and allow adequate time to fully cure.
C. Hand scrape and sand smooth all recesses, edges and corners to blend with surrounding areas.
D. Final pass shall be screened with 100 grit screen.
E. Sweep and vacuum all surfaces in order to remove all dust and residue from sanding. Wipe up all adjacent surfaces including walls, ceilings, windows, sills, doors, door frames, tops of baseboards and similar surfaces where dust may have collected.
F. Inspect the floor carefully prior to application of finish. Spot-fill missed cracks and nail holes and sand smooth when dry. Confirm with finish manufacturer that all fillers are compatible with finish materials.
G. Begin finishing immediately after cleanup procedures have been completed. Apply penetrating stain/sealer by hand wiping with rags, by brushing or with a lamb's wool applicator. Apply liberally at a coverage rate of approximately 500 square feet per gallon and in the direction of the flooring. Distribute material evenly, do not leave puddles or a heavy excess on the surface.
H. Allow to penetrate for 5-8 minutes. Use clean rags and wipe up the excess from the surface of the flooring. Do not allow material to dry before wiping. Do not allow

water drops, sweat, bare hands or knees to come into contact with flooring or discoloration will result.

I. Following the first application, allow to dry overnight or longer if necessary. Apply a second application at a coverage rate of approximately 800 square feet per gallon and in the direction of the flooring. Within 5-8 minutes before the material dries, buff the floor with a commercial buffing machine and buffer pad recommended by manufacturer of finishing material.
J. Clean and vacuum any dust residue.

3.05 CLEANING AND PROTECTION OF ASH FLOORING

A. Keep project premises free of debris. Collect material that may constitute a fire hazard, place in closed metal containers, and remove daily from site.
B. Protect work adjacent to finishing operations from splatters and spills. Fully restore any damaged surfaces. Remove masking and protection of adjacent surfaces upon completion.
C. Protect finished flooring from damage during remainder of construction period. Perform any repairs to flooring that may occur prior to project completion.
D. Invite the regional Manufacturer's Representative to the site for a project completion review and to train the Owner in the proper care and maintenance of the floor.
E. When maintaining the floor, vacuum dirt from the surface and only mop when necessary. When mopping, use a damp mop with clean water (no added cleaners) and do not saturate the floor.
F. Do not use harsh cleaners, wax or wood soap on the floor.
G. For periodic maintenance of the floor to build up the amount of sealer in the wood if fading occurs, clean the surface and apply a 1:4 mixture of Duraseal Penetration Finish and Duraseal Renovation Cleaner and Reconditioner. Apply to surface and remove by buffing in the same manner as the initial application of the product. This treatment reactivates the finish in order to penetrate and seal the floor.

END OF SECTION

SECTION 09 90 00 – PAINTING & COATING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not necessarily limited to the following:
   1. Painting of exterior wall surface elements, including but not necessarily limited to clapboards, trim, setting blocks, fascias, bulkhead door and other wall surfaces and elements.
   2. Painting of copper gutters, downspouts, drip edge and head flashings.
   3. Painting of cast iron rain leader boots and plumbing vents.
   4. Painting of exterior decking, railings, lattice, ramp, newels, balusters and stairs.
   5. Painting of exposed stone foundation walls including infilled areas.
   6. Painting all surfaces of exterior doors and frames.
   7. Painting all surfaces of interior doors and frames.
   8. Touch-up of interior and exterior surfaces of restored shop-painted windows (shop painting will be performed under Section 08 52 00 Wood Windows).
   9. Painting of wood windows, interior and exterior, furnished under Section 08 52 99 Wood Windows and Doors (Pella).
   10. Painting all surfaces of interior rooms (wood floors, walls, trim, ceilings) except wood floor in Den that will be e finished under Section 09 64 00 Wood Flooring.
   11. Other miscellaneous preparation and painting as indicated on the Drawings or as required by the Work for a completed project.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 06 20 13 Exterior Finish Carpentry.
   2. Section 06 20 23 Interior Finish Carpentry.
   3. Section 07 46 23 Wood Siding.
   4. Section 07 60 00 Sheet Metal Flashing and Trim.
   5. Section 07 92 00 Joint Sealants.
   6. Section 08 14 00 Wood Doors.
   7. Section 08 52 00 Wood Windows (Restoration).
   8. Section 08 53 99 Wood Windows and Doors (Pella).
   9. Section 09 21 16 Gypsum Veneer Plaster.

1.04 SUBMITTALS

A. General: Refer to Section 01 33 00 – Submittal Procedures for submittal provisions and procedures as applicable for the work of this Section.
B. Provide a minimum of 12” x 12” samples of each color type and coating system as selected by Architect.

C. Provide a mock-up of stain samples on bead board and of finish repair to existing bead board with the intent of matching existing finishes and blending repairs.
D. Product Data: Submit complete product data sheets and recommendations for mixing, application and curing. Products shall comply with all applicable regulations, including compliance with VOC requirements. Submit manufacturer warranty information.
E. Qualifications & Experience: Project experience of company and personnel performing the work under this Section shall demonstrate at least five (5) years experience with similar work as that required. If requested by Architect, submit project list and current phone numbers of references.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.
B. Store materials in designated areas only and in compliance with the manufacturer's requirements for ventilation, and temperature ranges and other conditions. Keep materials in tightly closed containers and away from open flames.
C. Discard and remove from the job site any materials damaged in handling and storage and any materials that have been subjected to conditions contrary to manufacturer's recommendations.

1.06 PROJECT CONDITIONS

A. Environmental Requirements: Paint may only be applied to surfaces when air, surface and material temperature and moisture content are within the range approved by the manufacturers. Proceed with work only when existing and forecasted weather conditions permit work to be performed in accordance with the manufacturer's requirements. Do not apply coatings during rain or snow or when humidity is in excess of manufacturer's recommended limit.
B. Prevent spillage of paint onto adjacent surfaces that may be exposed to damage or staining. Clean up spills and drips immediately and refinish any areas that are affected by the work of this Section.
C. Examine Substrate to determine their satisfactory condition prior to the installation of products specified in this Section.
D. Scheduling & Coordination: Coordinate the painting work with the Work of other Sections and with the schedule for completion of various areas as determined by the Contractor.
E. Note that many of the existing painted surfaces may contain lead. Take all necessary precautions during preparation of existing surfaces and conform to all applicable local, state and federal regulations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide first-class quality products for all systems by manufacturers noted, or approved equal. Match color chips to be selected by the Architect.
B. Colors may be selected from a range of manufacturer's standard colors and will not be limited to those of the particular manufacturer selected for use or specified below. Provide color matches to the selected colors and provide a record of the formulas and products for the Owner's future use.
C. Acceptable manufacturer for paint products include, but is not limited to, Benjamin Moore (BM). For stain products, acceptable manufacturere includes, but is not limited to, Cabot Stains (CB). The manufacturer's recommendations for preparation and use shall be followed for each application. In the event that a product specified below is not suitable for the substrate, notify the Architect in writing before

proceeding and propose an alternate product selection. If any surfaces scheduled to receive oil-based coatings currently contain water-based coatings, propose alternative primer and finish coat products for those locations.

1. Interior and Exterior Metal:
   a. Primer: BM Acrylic Metal Primer P04.
   b. Finish: BM DTM Acrylic Gloss Enamel P28.
2. Exterior Wood Trim, Doors, Frames, Windows:
   a. Primer: BM Fresh Start® Moorwhite® Penetrating Alkyd Primer 100.
   b. Finish: BM Aura® Waterborne Exterior Paint Semi-Gloss 632.
3. Window Sash Tracks (Wood-to-Wood Contact Surfaces):
   a. Tung Oil (darkened to hide epoxy repairs) or BM Alkyd Semi-Solid Stain C329. Test and compare both the tung oil and BM product on a field sample in place for review by Architect prior to application.
4. Exterior Wood Clapboard Siding:
   a. Primer: BM Fresh Start® Moorwhite® Penetrating Alkyd Primer 100.
   b. Finish: BM Aura® Waterborne Exterior Paint Satin Finish 631.
5. Exterior Stone Foundation Walls and Exposed Concrete (Bulkhead):
   a. Primer: BM Acrylic Masonry Sealer 066.
   b. Finish: BM Aura® Waterborne Exterior Paint Satin Finish 631.
6. Exterior Deck and Stairs at Side Entrances to 130 and 132:
   a. Primer: BM Fresh Start® Acrylic Primer 023.
   b. Finish: BM Latex Floor & Patio Enamel 122.
7. Exterior Deck/Stair/Ramp/Balustrades (except for IPE Wood):
   a. Primer: BM Fresh Start® Moorwhite® Penetrating Alkyd Primer 100.
   b. Finish: BM Aura® Waterborne Exterior Paint Semi-Gloss 632.
8. Exterior Deck/Ramp/Stair Treads/Top Rail of IPE Wood:
   a. Primer: CS Problem-Solver Wood Cleaner.
   b. Post Primer: Light sanding to open pores for maximum penetration.
   c. Finish: CS Australian Timber Oil #3400 Series.
9. Interior Wood Floors (except in Den per Section 09 64 00 Wood Flooring):
   a. Primer: BM Fresh Start® Acrylic Primer 023.
   b. Finish: BM Super Spec HP Waterborne Polyamide with Top Coat of Epoxy Gloss Coating P42 with Catalyst P4284.
10. Interior Wood Doors:
    a. Primer: BM Fresh Start® All Purpose Alkyd Primer 024.
    b. Finish: BM Aura® Semi-Gloss Waterborne Interior Paint 528.
11. Interior Casings, Trim, Wainscoting and Shelving:
    a. Primer: BM Fresh Start® All Purpose Alkyd Primer 024.
    b. Finish: BM Aura® Semi-Gloss Waterborne Interior Paint 528.
12. Interior Plaster Walls (Except in Bathroom 102):
    a. Primer: BM Fresh Start® Acrylic Primer 023.
    b. Finish: BM Aura® Eggshell Waterborne Interior Paint 524.
13. Interior Plaster Walls in Bathroom 102:
    a. Primer: BM Fresh Start® Acrylic Primer 023.
    b. Finish: BM Aura® Bath and Spa Matte Finish 532.
14. Interior Plaster Ceilings (Except in Bathroom 102):
    a. Primer: BM Regal Select Premium Interior Paint & Primer, Flat Finish, 547.
    b. Finish: BM Regal Select Premium Interior Paint & Primer, Flat Finish, 547.
15. Interior Plaster Ceilings in Bathroom 102:
    a. Primer: BM Fresh Start® Acrylic Primer 023.
    b. Finish: BM EcoSpec WB Sliver Interior Latex, Flat Finish, 473.

D. Paint Removal: Dummond Chemical Co., “Smart Strip” water-based, 100% biodegradable, zero VOC, pH neutral paint remover.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

A. Inspect surfaces to be painted and report any unsatisfactory conditions that are the result of the work of other Sections in writing to the General Contractor. Note that commencement of work on any surfaces indicates full acceptance of substrate conditions by the painter.
B. Arrange for Pre-Construction Conference with Contractor, Architect and Field Representative from selected manufacturer of coatings and removal systems. Review existing conditions and confirm best approach to preparation and application of products for longest lasting performance.
C. Comply with manufacturer's instructions and recommendations for preparation, priming and coating work. Confirm compatibility of specified paint with substrate and with previous finishes based on manufacturer's recommendations. Notify General Contractor in writing of any discrepancy.
D. At existing previously painted areas to be repainted, remove any blistered or peeling paint to sound substrates. Sand and feather edges of paint layers to eliminate variations in the surface and possible shadow lines. Remove chalk deposits and mildew and wash all surfaces with mild detergent. Perform related minor preparation including provision of fillers and sealants. Spot prime bare areas and areas susceptible to bleed-through staining prior to full priming and painting as specified.
E. Paint Removal: It is assumed that chemical and mechanical means (dry scraping) of paint removal will be utilized on site. Heat-related removal techniques will not be allowed. Chemical strippers for use on wood shall be fully compatible with epoxy repair and paint systems. Note that alkaline-based chemical strippers are not suitable for wood and will not be allowed; only neutral pH chemical strippers are acceptable.
F. Pre-prime all siding and trim to be installed. Prime all six sides and allow to cure prior to installation under the Work of other Sections.
G. Completely mask or otherwise protect areas adjacent to surfaces to be painted. Remove, mask or protect installed items that are attached to or in contact with surfaces to be coated.
H. Patch and repair any defects in existing surfaces. Fill all holes and imperfections with materials suitable for permanent bonding to the substrate. Sand smooth to blend with adjacent planes and to eliminate any irregularities or imperfections. Remove all dust from surfaces to be painted and from all surfaces adjacent to the work area.
I. Provide sealant at locations where dissimilar materials abut one another. Sealant shall be installed over backer rod where the depth of the joint exceeds the width. Tool sealant neatly and remove any spillage or overlap with adjacent surfaces that may affect finished appearance.

3.02 PAINT REMOVAL

A. Remove loose and failing paint from existing surfaces to be painted. Retain any well adhered paint unless on a wearing or contact surface. Intact historic paint layers should remain in place to the extent possible.
B. For best results, surface temperatures should be 60ºF – 95ºF. Product can be applied as low as 37ºF, however, efficiency/effectiveness are reduced and dwell time increases.
C. Prepare a test area on each type of surface and paint coating prior to full application. Testing will ensure product suitability and will also determine the proper thickness of the remover and the dwell time required for project components.
D. Mask/protect areas where stripping is not desired, including adjoining surfaces where overspray may travel. Use polyethylene (plastic sheets) and masking tape as a

barrier. Plants and other foliage should be covered or rinsed thoroughly before and during application.

E. Using brush, roller or airless spray, apply approximately 1/6" to 1/8" thick (refer to test patch results) according to the age, number of layers, and type of coating being removed. Start at the lowest pressure setting and slowly build pressure until an adequate fan pattern has been achieved; high pressure is not required or desired. Two separate applications are recommended to build film thickness. Apply a light first coat and allow it to dwell for about 30 minutes. Then apply a second coat to build the film to the desired thickness.
F. Remove softened/lifted paint using a scraper, taping knife, squeegee or power washer. Agitate tough to remove residue with a stiff nylon brush or scouring pad, paying particular attention to crevices, grooves and cracks. Exterior stripped surfaces should be rinsed thoroughly with clean water using nylon brushes. Do not power wash exterior surfaces. Interior surfaces can be rinsed using a spray bottle or pail, a sponge and water, or denatured alcohol to remove remaining residue.
G. Collect remover, paste and paint residue in plastic bags and dispose of in compliance with local government regulations. Do not collect or store removed paint/paste waste in metal containers. Clean up airless sprayer by running water or denatured alcohol through the equipment soon after application has been completed. Allow surface to dry thoroughly before repainting.

3.03 APPLICATION

A. Apply paint and coating products in strict accordance with manufacturer's printed instructions. Apply with adequate illumination and ventilation.
B. For application of specified coatings, follow manufacturer's printed instructions for the timely application of multiple coats.
C. Provide an adequate number of finish coats to provide complete coverage, usually consisting of a minimum of two coats depending upon the product and application.
D. Lightly sand painted surfaces between coats. Vacuum surfaces free of loose particles prior to application of next coat.
E. Match approved color samples. Re-coat work which does not match or which shows loss of adhesion to substrate or previously painted surfaces. Should any final coat be deemed unsatisfactory, it shall be sanded and additional coats applied as necessary until satisfactory finish is achieved.
F. Apply products evenly and smoothly, free of runs, drips, sags, holidays, lap marks, air bubbles and pinholes in order to assure a smooth finish.
G. Unless noted otherwise, paint both sides of all doors and frames located in areas scheduled to be painted.
H. Prepare and paint any areas which are damaged or disrupted by the work of this contract utilizing materials and finishes which match adjacent undamaged surfaces in their entirety.

3.04 CLEANING AND PROTECTION

A. Keep project premises free of painting-related debris. Collect material that may constitute a fire hazard, place in closed metal containers, and remove daily from site.
B. Protect work adjacent to painting operations from paint splatters and spills. Immediately remove paint that falls on finished surfaces not scheduled to receive paint, using materials and techniques that will not damage affected surfaces. Fully restore any damaged surfaces.
C. Leave any unopened or slightly used materials for the Owner in clearly marked containers. Place containers in an area designated by the Owner on site for storage. Provide final painting schedule with list of products, finishes and colors utilized in the project.

END OF SECTION

SECTION 10 28 16 - BATH ACCESSORIES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Towel bars
   2. Toilet paper holder
   3. Double hooks
   4. Shower rod
   5. Mirror

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 06 10 00 Rough Carpentry.
   2. Section 06 20 23 Interior Finish Carpentry.
   3. Section 09 26 13 Gypsum Veneer Plaster.
   4. Section 09 28 13 Cementitious Backing Boards.
   5. Section 09 30 00 Tiling.

1.04 SUBMITTALS

A. Product Data: Submit to Architect for approval complete product data for all work of this SECTION. Data shall consist of complete product description, specifications, catalogue cuts, maintenance and care instructions and any other relevant information.
B. Shop Drawings for shower door: Submit to Architect for approval complete shop drawings indicating layout, details, supports, location and relationship to adjacent construction.

1.05 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
B. All surfaces shall be smooth and free of any sharp edges, corners or seams. Any units that fail to meet this criteria shall be repaired to the Architect’s satisfaction or be replaced.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Valsan, Inc., 67 Lafayette Avenue, White Plains, NY 10603; 888-825-7266; http://www.valsanbathroomsusa.com
B. Rejuvenation, 2550 NW Nicolai Street, Portland, OR, 97210; 888-401-1900; http://www.rejuvenation.com
C. California Faucets, 5231 Argosy Drive, Huntington Beach, CA 92649; 800-822-8855; http://www.calfaucets.com

2.02 MATERIALS

A. Towel Bars: Valsan Kingston Towel Rails, lengths as shown on the Drawings.
B. Toilet Paper Dispenser:
   1. Valsan Kingston Double Post Paper Holder, at first floor locations.
   2. Rejuvenation Toilet Paper Holder #C6999, at second floor location.
C. Robe Hooks: Valsan Kingston Double Hook for both doors in first floor Bathroom 102.
D. Roller Shower Curtain Rings: Similar to Rejuvenation solid brass rings but with finish of brushed or satin nickel (Rejuvenation has only polished brass and polished nickel).
E. Shower Rods: Valsan Kingston 6' Shower Rod with Kingston Supports; field cut rod to length as shown on the Drawings. (Shower Curtain by Owner – see 3.01.B.)
F. Mirrors: Polished plate glass mirror with custom painted wood frame to be provided under Section 06 20 21 Interior Finish Carpentry.
G. Grab Bars: California Faucets Cal Trim 9400 Series with La Jolla 38 escutcheon, lengths and locations as indicated on the Drawings.
H. Coat Hooks: Rejuvenation Classic Double Coat Hook #C1280, as indicated on the Drawings or as noted below.
   1. Four (4) double hooks in Kitchen "Coats" cabinet.
   2. Double hooks in quantity noted within second floor office closets per Drawings.
   3. On back of second floor Bath 208 door.
I. Paper Towel Dispensers: to be selected and furnished by the Owner, installed by the Contractor; locations include Kitchen 115, Bath 205 and Passage 202.

2.03 FINISHES

A. Brushed Nickel on solid brass for accessories in the first floor Bathroom 102 and Half Bath 108.
B. Polished Chrome on solid brass for accessories in the Second Floor Bath 205.
C. Oil Rubbed Bronze on solid brass for hooks in kitchen "coats" and office closets.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation shall be provided under the Work of Section 06 20 21 Interior Finish Carpentry. Install items as shown on the Drawings and in accordance with manufacturer's instructions.
B. Consult with Owner prior to setting height of Shower Rod (curtain length unknown).
C. Install items in proper relation to adjacent construction and with uniform appearance. Check substrate material, blocking and mounting plates to be assured that they are plumb, square and securely attached to adjacent construction.
D. Verify blocking within the wall and install units securely attached to blocking.
E. Clean and protect work from damage throughout the construction period. Restore any damaged finishes and replace any damaged devices. Test each device for proper operation.

END OF SECTION

SECTION 10 44 00 – FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not necessarily limited to the following:
   1. Fire extinguishers and surface mounted wall brackets.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this SECTION. Other Sections that relate directly to work of this SECTION include, but are not limited to, the following:
   1. Section 06 10 00 Rough Carpentry.
   2. Section 06 20 23 Interior Finish Carpentry.

1.04 SUBMITTALS

A. Product Data: Submit to Architect for approval complete product data for all work of this SECTION. Data shall consist of complete product description, specifications, catalogue cuts, maintenance and care instructions and any other relevant information.
B. Shop Drawings: Submit to Architect for approval complete shop drawings indicating layout, details, supports, location and relationship to adjacent construction.

1.05 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
B. All surfaces shall be smooth and free of any sharp edges, corners or seams. Any units that fail to meet this criteria shall be repaired to the Architect’s satisfaction or be replaced.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Manufacturers
   1. Provide products from one of the following maunfacturer's or an approved equal.
      a. Larsen's Manufacturing Co.
      b. J.L. Industries, Inc.
      c. William Brothers Corporation of America
B. Fire extinguishers: UL listed and labeled units.
   1. Multi-purpose dry chemical Type ABC, 10 lb. on surface mounted wall brackets in rooms, other than those noted below, where indicated on the Drawings.
   2. Carbon dioxide Type BC, 15lb. in basement level on surface-mounted wall brackets where indicated on the Drawings.
   3. Wet chemical Type K, 6 liter in first floor kitchen and second floor passageway where indicated on the Drawings.
C. Brackets: Wall-mounted heavy duty quick-release friction fit brackets made by or certified by the manufacturer of the extinguishers.

PART 3– EXECUTION

3.01 INSTALLATION

A. Install surface-mounted wall-hung brackets at locations and heights to be determined and acceptable to authorities having jurisdiction. Provide sufficient blocking within the walls where required for solid attachment. Refer to the Drawings for recommended locations of all fire extinguishers.
B. Install brackets plumb and level at locations indicated on the Drawings; mounting height shall be 48" AFF to handle of extinguisher except where adjustments to this height are required due to the constraints of surrounding features.
C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
D. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 11 31 13 - RESIDENTIAL KITCHEN APPLIANCES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table Of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Built-in appliances at Kitchen
   2. Laundry appliances at Kitchen

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 06 10 00 Rough Carpentry.
   2. Section 06 20 23 Interior Finish Carpentry.
   3. Section 06 41 00 Architectural Wood Casework.
   4. Section 09 64 00 Wood Flooring.
   5. Section 09 28 00 Cementitious Backing Boards.
   6. Section 09 30 00 Tiling.
   7. Section 12 36 40 Stone Countertops.
   8. Section 22 00 00 Plumbing.
   9. Section 23 00 00 HVAC.
   10. Section 26 00 00 Electrical.

1.04 SUBMITTALS

A. Materials order.
B. Manufacturer's installation and operating instructions.

1.05 WARRANTIES

A. Submit manufacturers' warranties for all appliances specified under this section.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver appliances to project site until base cabinets, countertops, floors, and electrical, plumbing, and gas rough-ins are ready to receive them.
B. Store appliances indoors prior to installation.
C. Handle appliances carefully to prevent damage to finished surfaces.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Bosch, BSH Home Appliances 5551 McFadden Ave, Huntington Beach, CA 92649; 8800-944-2904; http://www.bosch-home.com/us
B. Maytag, 553 Benson Road, Benton Harbor, MI, 49022; 800-344-1274; http://www.maytag.com

2.02 APPLIANCES

A. Cooktop: Bosch 30" Gas Cooktop NGM3054UC, stainless steel.
B. Downdraft: Bosch 30" Downdraft Ventilation DHD3014UC, stainless steel; with optional remote blower included.
C. Wall Oven: Bosch 30" Single Convection Wall Oven HBL5450UC, stainless steel.
D. Microwave: Bosch Built-in Microwave HMB5050UC, stainless steel; with optional 30" trim kit.
E. Dishwasher: Bosch 24" Ascenta Evolution Dishwasher SHE4AP05UC, stainless steel.
F. Refrigerator: Bosch 36" Side-by-Side Refrigerator B22CS30SNS, stainless steel.
G. Washer: Maytag 27" Front Load Stacked Washer MHWE200XW, white.
H. Dryer: Maytag 27" Front Load Gas Stacked Dryer MGDE200XW, white.
I. Garbage Disposal: InSinkErator Evloution Excel, provided by the Plumbing Subcontractor per Section 22 00 00.

PART 3- EXECUTION

3.01 EXAMINATION

A. Examine cabinets, countertops, floor surfaces, and electrical, gas, and plumbing work to verify that they are ready to receive appliances.
B. Proceed with installation only after any unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Follow manufacturers' instructions.
B. Take care to protect cabinets, countertops, and flooring from damage.
C. Install air gap in dishwasher waste line as required by local codes.

END OF SECTION

SECTION 12 36 40 - STONE COUNTERTOPS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to Division 00 and Division 01, as listed in the Table Of Contents, which are hereby made part of this Section by reference thereto.
B. Attention is directed to the existing conditions at the site. The Contractor shall become thoroughly familiar with the existing conditions in order to assess the scope of work required.

1.02 WORK INCLUDED

A. Provide labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:
   1. Soapstone countertops, backsplash, window stools, window aprons and sink at Kitchen.

1.03 RELATED WORK

A. Examine the Contract Documents in their entirety for requirements that affect the work of this Section. Other Sections that relate directly to work of this Section include, but are not limited to the following:
   1. Section 06 20 23 Interior Finish Carpentry.
   2. Section 06 41 00 Architectural Wood Casework.
   3. Section 11 31 13 Residential Kitchen Appliances.
   4. Section 22 00 00 Plumbing.

1.04 REFERENCES

A. *A Homeowner's Guide to Natural Stone Countertop Installation*, Marble Institute of America, 28901 Clemens Rd., suite 100, Cleveland, OH 44145; 440-250-9222; www.marble-institute.com.

1.05 SUBMITTALS

A. Samples: Submit samples of material showing edge treatment, finish, and color.
B. Shop drawings: Submit shop drawings showing layout of all stone pieces, location and size of all seams, and details of corner and edge conditions.

PART 2- PRODUCTS

2.01 SUPPLIER

A. As selected by the Contractor, subject to review and approval by the Architect.

2.02 MATERIALS

A. Soapstone:
   1. Counters: 1.25" thick, eased edge, traditional drainboard grooves sloped to sink.
   2. Backsplash: 0.75" thick, square edge, height per Drawings and field dimensions.
   3. Sink: 1.25" thick in configuration indicated on the Drawings.
   4. Window Stool: 1.00" thick, eased edge.
   5. Window Apron: 1.00" thick square edge.
B. Adhesives: as recommended by the stone supplier.

C. Seam filler: as recommended by stone supplier.
D. Reinforcement: stainless steel rods embedded in epoxy resin.

PART 3 - EXECUTION

3.01 EXAMINATION & FIELD MEASURMENTS

A. Base cabinets, (including doors, end panels, and hardware) must be permanently installed before field measurements are made for countertops.
B. When taking field measurements (templating), cooktop and downdraft vent must be available on-site.
C. Verify that the tops of base cabinets to receive stone countertops are within 1/8" of flat and level when measured across 10 ft.

3.02 FABRICATION

A. Cut and prepare slabs to the following tolerances:
   1. Joint (seam) width: 1/16" ±1/64".
   2. Lippage: 0" at front and rear edges, max. 1/32" at center of countertop.
   3. Slab thickness: thickness of non-adjacent slabs shall not vary by more than 1/8".
   4. Joints between stone and other materials: 1/8" ±1/16".
   5. Slab flatness and levelness:
      a. Individual slabs are to be flat within 1/16" across 4 ft.
      b. Finished countertops, including multiple slabs, are to be flat and level within 1/8" across 10 ft.
B. Ease edges of countertop nosing and window stools.
C. Cut out and reinforce for soapstone sink, using stainless steel rods embedded in epoxy resin.

3.03 INSTALLATION

A. Dry fit slabs in place to verify satisfactory fit before applying adhesive.
B. Shim as necessary using plastic shims spaced no more than 24" apart, or using continuous noncompressible filler material ("hard packing").
C. Fill seams prior to final positioning of countertop slabs; mask surface as necessary.
D. Secure countertops to the substrate using a nonstaining adhesive.
E. Clean the soapstone thoroughly after adhesives have fully cured. Provide initial treatment of all surfaces with mineral oil in accordance with manufacturer's recommendations.
F. Provide instructions to the Owner regarding sealing and care of the soapstone.

END OF SECTION

SECTION 22 00 00 - PLUMBING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.

1.02 DEFINITIONS

A. ADA: Designed to meet the requirements of the Americans with Disabilities Act.

B. Concealed: Shall mean in walls, in chases, above ceilings, within enclosed cabinets, otherwise enclosed.

C. Equal: Shall mean essentially the same as that product specified, but a model of a different manufacturer

D. Exposed: Shall mean in finished spaces, in closets, under counters, behind and/or under equipment and/or otherwise visible.

E. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.

F. Materials: Shall mean any product used in the construction, including but not limited to: fixtures, equipment, piping and supplies.

G. Others: Shall mean provided by sections other than this section. If not purposely assumed by another section, shall be provided by the Contractor.

H. Piping: Shall mean pipe, fittings, hangers and valves.

I. Provide: Shall mean the furnishing and installing of materials.

J. Reviewed equal: Shall mean that the Architect or a designated Consultant, not the contractor, shall make final determination whether materials are an equal to that which is specified.

K. Substitution: Shall mean materials of significantly different physical, structural or electrical requirements, performance, dimensions, function, maintenance, quality or durability, than that specified.

1.03 WORK INCLUDED

A. Description

1. Furnish all labor, materials, equipment, transportation, and perform all operations required to install complete plumbing systems in the building, in accordance with these specifications and applicable drawings.

2. Provide the following:

   a. Sanitary, waste and vent systems.
   b. Domestic hot and cold water system.
   c. Fuel gas system.
   d. Pipe, valve and fittings
   e. Water specialties
   f. Drainage specialties
   g. Plumbing fixtures and accessories
   h. Insulation
   i. Installation and/or connections to equipment provided by others.

3. Specifications and accompanying drawings do not indicate every detail of pipe, valves, fittings, hangers, fixtures and equipment necessary for complete installation; but are provided to show general arrangement and extent of work to be performed.

B. Before submitting proposal, This Contractor shall be familiar with all conditions. Failure to do so does not relieve This Contractor of responsibility regarding satisfactory installation of the system.

1.04 PERMITS

This Contractor shall be responsible for providing and filing all Plans, Specifications and other documents, pay all requisite fees and secure all permits, inspections and approvals necessary for the legal installation and operation of the systems and/or equipment furnished under this Section of the Specifications.

1.05 CODES AND ORDINANCES

All work performed under this Section of the Specifications shall be done in accordance with applicable Federal Laws, Maine State Laws, Maine Plumbing Code, Subsurface Wastewater Disposal Rules, and local plumbing codes and ordinances. The following standards are also to be followed when applicable:

ADA	Americans With Disabilities Act
NFPA	National Fire Protection Association (a.k.a. NFC, National Fire code)
NEMA	National Electrical Manufacturer's Association
OSHA	Occupational Safety and Health Act

1.06 QUALITY ASSURANCE

A. Use sufficient qualified workmen and competent supervisors in execution of this portion of the work to ensure proper and adequate installation of the system throughout. Work performed shall conform to manufacturers' recommendations, good standard practice and industry standards.

B. Any work deemed unacceptable by the Engineer, Architect or owner shall be redone correctly, at no additional cost to the owner.

1.07 SHOP DRAWINGS & SUBMITTALS

As soon as possible after award of Contract, before any material or equipment is purchased, Plumbing Contractor shall submit to the Architect shop drawings for approval.

1.08 AS-BUILT DRAWINGS

Keep in good condition at the job, apart from all other prints used in actual construction, one complete set of all blueprints furnished for this job. On this special set of blueprints, record *completely and accurately* all differences between the work as actually installed and the design as shown on the drawings

1.09 OBJECTIONABLE NOISE AND VIBRATION

All equipment shall operate without objectionable noise and vibration. Should objectionable noise or vibration be transmitted to any occupied part of the building by apparatus or piping, as determined by the Architect, the necessary changes eliminating the noise or vibration shall be made by this Contractor at no extra cost to the Owner.

1.10 GUARANTEE

This Contractor shall guarantee all materials and workmanship furnished by him or his sub-contractors to be free from all defects for a period of no less than one (1) year from date of final acceptance of completed system and shall make good, repair or replace any defective work which may develop within that time at his own expense and without expense to the Owner. Any additional costs required to extend manufacturer's guarantee and warranty for the period specified, shall be included in Contractor's base bid.

1.11 DEVIATIONS, DISCREPANCIES AND OMISSIONS

A. The drawings are intended to indicate only diagrammatically the intent, extent, general character and approximate locations of plumbing work. Work indicated, but having details obviously omitted, shall be furnished complete to perform the functions intended without additional cost to the Owner. This shall include but not be limited to:

1. All items that are required to meet all applicable codes and referenced standards.

2. Piping for cold and hot water supply, drain, vent, gas, etc to each plumbing fixture/equipment shown on the drawings or scheduled as required.

3. Shut-off valves on lines feeding individual fixtures without integral stops.

4. Minor single phase electrical or control wiring between Plumbing provided items that require it, unless indicated on the Electrical Drawings.

5. Plumbing related items indicated on the drawings of other trades.

6. Items indicated on one plumbing drawing but not shown on a corresponding drawing.

7. Items implied on the plumbing drawings but not shown.

8. All plumbing related items clearly shown in dark print on the Plumbing drawings but not included in the specification, unless it is noted as being provided by the owner or other contractor or unless other sections assume the responsibility.

B. The drawings and specifications are complimentary to each other and what is called for in one shall be as binding as if called for by both. In the event of conflicting information on the drawings, or in the specifications, or between drawings and specifications, or between trades, that which is better, best or most stringent shall govern.

PART 2 - PRODUCTS

2.01 GENERAL

A. Unless otherwise indicated, the materials to be furnished under this contract shall be new and the standard products of manufacturers regularly engaged in the production of such equipment, and shall be the manufacturer's latest standard design that complies with the specification requirements.

B. Unspecified items shall be by the same manufacturer and level of quality and as similar items specified, whenever possible. When no similarity exists the Contractor shall submit for review an appropriate commercial/institutional quality item, complete to perform the functions intended, using his best discretion. The Architect or Engineer, not the contractor, shall make final determination whether materials are of suitable quality and perform the functions intended.

2.02 HANGERS AND SUPPORTS

A. General

1. All hangers and supports shall be especially manufactured for that purpose and shall be the pattern, design and capacity required for the location of use.

2. Piping specified herein shall not be supported from piping of other trades.

3. All steel hangers shall be factory painted.

4. Hangers shall be heavy-duty steel adjustable clevis type, plain for steel, cast iron and plastic pipe, and copper plated for piping in direct contact with copper tubing shall be equal to Carpenter & Paterson Inc.,

5. Hangers shall go outside of insulation for domestic water piping. Each hanger shall be furnished with metal shield.

B. Hanger Rods & Attachments

1. Hanger rods shall be galvanized all thread rod. Rod size shall be as follows:

Pipe Size	Rod Size
3/8” to 2”	3/8”
2.1/2” to 3.1/2”	1/2"
4” to 5”	5/8”

2. All nuts for hanger rods and hangers to be galvanized steel.

3. Provide lag points with rod couplings for fastening to wood, toggle bolts in concrete blocks and compound anchor shields and bolts in poured concrete.

4. Provide and install angle iron supports for pipe hangers in locations as required. Angle iron supports shall be adequate size for span and piping or equipment.

5. Hot and cold water piping at each fixture shall be securely fastened in wall with split ring type hanger fastened to studs within wall.

2.03 SEISMIC RESTRAINT

All seismic restraints shall be in accordance with the International Building Code.

A. Piping Suspended by Hangers

Piping suspended by individual hangers 12 inches or less in length, need not be braced. The following piping shall be braced:

1. Fuel Gas, 1 inch and larger

   a. Brazed or Soldered Joints - Transverse bracing every 20 feet and longitudinal every 40 feet.
   b. Threaded or Mechanical Joints - Transverse bracing every 10 feet and longitudinal every 20 feet.

B. Piping Risers

1. All vertical pipe risers shall be laterally supported with a riser clamp at each floor.

2. No-hub joints shall be braced or stabilized between floors.

C. Equipment

1. All floor/pad mounted equipment including: water heaters, above ground water storage tanks, pneumatic pressure tanks, expansion tanks and boilers shall be anchored to the floor.

2. Suspended equipment shall be cross braced in all directions.

2.04 IDENTIFICATION

A. Tag each new pump /equipment, and switch with 2½ inches x ¾ inch rectangular engraved nameplates with white letters on black, #2060-20 by Seton Name Plate Corp. or reviewed equals. Nameplates shall be mechanically fastened to equipment (adhesives are not acceptable). Embossed labels are not acceptable.

B. Identify all new water and drain piping with "Set Mark" snap-around pipe markers by Seton Name Plate Corporation or reviewed equal. Markers shall include both identification and arrows indicating direction of flow. Markers shall be placed on pipe segments 5 feet and longer, and spaced no less than 10 feet apart. Heating hot water piping shall be labeled differently from Domestic hot water piping. On parallel runs of piping, plumbing markers shall be grouped together, and grouped with heating markers whenever practical.

Legend	Background/Letter Color
"Cold Water"	Green/ white letters
"Domestic 120°F Water"	Yellow/ black letters
"Domestic 120°F Return"	Yellow/ black letters
"Domestic 140°F Water"	Yellow/ black letters
"Gas"	Yellow/ black letters
"Plumbing Vent"	Green/ white letters
"Sanitary Drain"	Green/ white letters

C. Tag all new valves with Seton #M4506 1½ inch square brass tags and #6 bead chains, stamped with the following identification: "CW", "HW", "HWR" or "140HW". Tag shall be consecutively numbered. DO NOT DUPLICATE EXISTING VALVE IDENTIFICATION NUMBERS. Fixture stops, control valves or valves adjacent to equipment, the use of which is obvious, are not to be tagged.

D. Provide valve charts identifying valve number, valve identification and service (i.e. Apt. 203, HW). Mount charts in Boiler Room and Mechanical Room in 8½ inch x 10 inch and 8½ inch x 11 inch self-closing aluminum frame with plastic windows. Provide additional copies for maintenance manuals.

2.05 INSULATION

A. Insulation shall be provided for water piping, except exposed connections to fixtures. Insulation systems shall have a flame spread rating of 25 or less, and a smoke developed rating of 50 or less.

Shields of 28 gauge metal approximately 8 inches long and forming an arc of approximately 120 degrees to fit insulation shall be provided at each hanger for all domestic water piping. Shields to be provided by this Contractor. Hangers shall be provided large enough to be outside covering. (This is to prevent condensation points along hangers on the cold water piping, and to reduce heat loss and minimize unintended heating of the building envelope during the summer months from the hot water piping)

B. Domestic Cold Water

Insulate piping with a minimum one half inch ½" thick, well installed and sealed

Armaflex Pipe Insulation with pressure sealing lap adhesive OR fiberglass heavy density sectional pipe insulation system with minimum of 7 lb. density having a factory applied vapor barrier laminate all service ASJ jacket. Insulation jacket to have pressure sealing lap adhesive.

C. Domestic Hot Water

Insulate piping with a minimum one half inch 1" thick, well installed and sealed Armaflex Pipe Insulation with pressure sealing lap adhesive OR fiberglass heavy density sectional pipe insulation system with minimum of 7 lb. density having a factory applied vapor barrier laminate all service ASJ jacket. Insulation jacket to have pressure sealing lap adhesive.

D. Fittings

1. All fittings and valves shall be covered with a one piece PVC insulated fitting cover secured.

2. The ends of fiberglass insulation on exposed pipes at valves, flanges, unions, etc., shall be finished neatly with covering to match jacket and secure with mastic.

3. Valves, flanges and unions on hot water piping shall not be insulated.

E. Covering

Contractor shall endeavor to run piping **concealed** in finished areas whenever possible, however where insulation is exposed in finished areas, it shall be carefully and neatly covered with a white PVC plastic covering material. Covering shall be applied in no less than 4 foot lengths with shingle joints. Longitudinal joints shall be on the top or back sides so as to be out of sight and sealed with adhesive materials provided with the jacketing. Material shall be butted to finish walls or Insulation. Jacketing material shall be Zeston pre-cut, pre-curled 0.030 thickness. Or reviewed equal.

- OR -

Use Owens Corning Evolution SSL II paper free ASJ with tough, wrinkle resistant, easy to-clean jacket. Install will great care for appearance, turning any writing or seams toward the wall. Or reviewed equal.

2.06 VALVES

A. General

1. Valves shall be provided as shown and as required to make the installation and its apparatus complete in operation; locate to permit easy operation, replacement and repair.

2. All valves must be so constructed that they may be repacked under pressure while open.

3. Valves shall have name and/or trademark of manufacturer as well as working pressure stamped or cast on valve body.

4. Valves shall comply with Manufacturer's Standards Society (MSS) specifications and be so listed.

B. Types and Manufacturers

All valves shall be of one manufacturer and by one of the manufacturers listed. The following list is provided as a means of identifying the quality and type required.

1. Globe Valves 2 inches in size and smaller

Shall have bronze bodies, union bonnet, renewable composition disc for service intended, rated for 150# WSP, 300# WOG:

	Soldered Ends	Screwed Ends
Milwaukee	1590-T	590-T
Stockham	B-24-T	B-22-T
NIBCO	S-235-Y	T-235-Y
Hammond	IB423	IB413T

2. Angle valves

Same general description and manufacturers as globe valves above, only outlet at 90 degree angle from inlet.

3. Ball valves

Shall have bronze bodies, Type 316 stainless steel stems and balls, reinforced Teflon seats and seals, blowout proof stems and adjustable stem gland. Shall be equipped with suitable packing for service intended. Ports shall be "conventional port". Rated for 400# WOG and 350^{o}F:

	Soldered Ends	Screwed Ends
Apollo	70-200	70-300
Watts	B-6000-SS	B-6001-SS
NIBCO	S-585-66	T-585-66
Hammond	8514	8503

4. Check Valves 2 inches in size and smaller

Shall be horizontal swing type with bronze body, Teflon disc. Rated for 125# WSP, 200# WOG:

	Soldered Ends	Screwed Ends
Milwaukee	1509-T	509-T
Stockham	B-310-T	B-320-T
NIBCO	S-413-Y	T-413-Y
Hammond	IB945	IB904

5. Drain Valves

Shall be conventional ball valves and provided with hose nipples and threaded metal cap on chain. Watts B-6001-CC or reviewed equal.

2.07 DOMESTIC WATER PIPING

A. Water Service

1. Connect to existing water line in building.

B. Interior Exposed, High temperature and Supportive

1. All exposed piping carrying domestic water, all piping with a temperature above 130 deg. F., all piping supporting inline equipment, and piping within 6 ft of the water heaters, shall be hard-drawn type “L” copper tube with cast or wrought fittings and made up with Silvabrite 100 lead-free solder. Care shall be taken not to over flux.

C. General

All concealed hot (below 130) and cold water piping above finish floor (not buried) shall be one or a combination of the following:

1. Copper as specified above, all sizes

2. Flowguard Gold CPVC pipe and fittings, all sizes.

a. Piping shall be installed in a neat and orderly manner. No wild spaghetti installations will be tolerated. Piping shall be run straight and parallel, and level or sloped slightly to low points with no droops exceeding 1/8”. Any work that in the opinion of the Architect or Engineer of Record that does not meet these standards will be removed and redone at the Contractor’s expense.

b. The piping shown on the drawing is configured as a standard branch system. If the contractor wishes to use a manifold once inside the respective unit it is allowed, provided the contractor submits a typical sketch showing:
a. Where the manifold will be located, and how accessed, i.e. valve box, access panel or above tile ceiling.
b. All tubing, bends and fittings.
c. A detail showing how the insulated piping turns to drop/rise in walls.
d. A detail showing the pipe hangers, insulation and saddles.
e. A detail showing how the piping penetrates fire rated walls with the U.L. Listed fire-stopping system approved for that wall type.

c. All work shall be done in accordance with the manufacturer’s recommendations.

3. Any buried water and any trap primer piping shall be type “K” soft copper tubing. No joints below slab.

4. All exposed, uninsulated water piping near fixtures in finished areas shall be chromium plated I.P.S. copper or red brass pipe or tubing and fittings.

Valves shall also be chrome plated brass or bronze. Any chrome trim with wrench marks shall be removed and new trim installed.

5. Type of tubing shall be stamped or printed on each length by Manufacturer.

2.08 SANITARY WASTE AND VENT PIPING

A. Vent Piping, and Most Sanitary Waste Piping

Piping and fittings shall be PVC Schedule 40 polyvinyl chloride plastic, as per ASTM-A-2665 or latest standard. Solvent as per ASTM-D-2564. Exposed vent piping above roof shall be **black** cast iron for appearance and solar heat dissipation of frost.

B. Storm Water and Sanitary Waste near Bedrooms.

The piping has been laid out to avoid sound sensitive areas, such as bedrooms as much as possible. If shown above such, or redirected due to unavoidable field conditions, this piping that runs over or drops adjacent to such areas shall be standard weight cast-iron, conforming to Commercial Standards CS188-66. Fittings shall be cast-iron, no-hub ASA Group 022 pipe, complete with neoprene elastomer, corrosion-resistant stainless steel shield and clamping assemblies conforming strictly to ASME Standard C654 and requirements of CISPI Standard 310.

Substitution with PVC piping, or other piping system with inferior sound deadening characteristics, is not allowed. Substitution of piping system with equal or superior sound deadening characteristics can be submitted for review provided it is accompanied by the manufacturer's literature citing proof of acoustic properties by an independent laboratory testing agency.

2.09 FUEL GAS SYSTEM

A. Coordinate with General Contractor and contact the Gas Supplier for modification of the gas meters at the existing/entrance.

B. Seismic requirements, see SEISMIC RESTRAINT section.

C. Piping inside the building shall be one or a combination of the following:

1. Schedule 40 black steel pipe, ASTM 120 with 150# screwed pattern malleable iron fittings, shall meet ASTM A-47, ASA B16.3. Pipe joint compound shall be used on all threaded joints.

2. Gastite corrugated stainless steel tubing and fittings. Gastite® is a corrugated stainless steel tubing complying with ANSI LC 1 "Fuel Gas Piping Systems Using CSST" and listed with CSA®, ICC and IAPMO. Manufacturing materials are: ASTM A240 type 300 corrugated stainless steel tubing with a minimum wall thickness of .010", jacketing of UV resistant polyethylene meeting the requirements of ASTM E84 for flame spread and smoke density. All mechanical tube fittings are SAE CA360 brass incorporating double wall flare sealing and Jacket Lock® jacket capturing for steel tubing protection. Exception: do not use Gastite inside fireplaces.

Note: Gastite has a yellow coating to indicate gas and does not need to be painted

D. Provide dirt leg, gas cock and union at boiler. Provide gas cock and flex connect with union at any each appliance.

E. No piping/tubing shall be run horizontally inside hollow partitions. Piping running vertically concealed inside walls shall be run without fittings and run inside Gastite Lfloppy steel conduit. Steel piping passing through masonry shall be sleeved to prevent corrosion.

F. Installation shall meet the requirements of the gas supplier and NFPA 54.

2.10 PIPE SLEEVES AND ESCUTCHEONS

A. Sleeves

1. Contractor shall set sleeves for all piping penetrating walls and floors. Sleeves through masonry shall be steel pipe sleeves two sizes larger than pipe.

2. Space between sleeves and pipes shall be sealed to make smoke and water tight with 3M Brand Fire Barrier Caulk CP25 or Putty 303.

B. Exterior Sleeves

Where piping passes through exterior walls, provide and install a complete pipe sleeve/hydrostatic wall closure system.

1. Wall sleeve shall be schedule 40 steel pipe, two pipe sizes larger than carrier pipe. Sleeve shall be the same length as the thickness of the wall served.

2. The hydrostatic closure device shall consist of identical interlocking links of solid synthetic rubber compounded to resist ozone, water, chemicals and extreme temperature variations. Each link shall be connected by corrosion resistant bolts and nuts to form a belt that is to fit snugly around the pipe. Under each bolt and nut there shall be a metal pressure plate so that when each nut is tightened the rubber links will expand between the pipe and sleeve to form a continuous, air tight and water tight seal.

3. Units to be Link-Seal system Model LS wall seal by Thunderline Corp. or reviewed equal.

C. Escutcheons

Where piping passes through finish walls, floors, ceilings and partitions, provide and set two piece nickel plated steel floor and ceiling plates.

2.11 PLUMBING FIXTURES

A. DW-1 Dishwasher, Residential Under Counter

1. Appliance is not provided by this Plumbing contractor.

2. Provide PPP water hammer arrester. Or approved equal.

B. LV-1 Lavatory, Wall Mounted – Residence Half Bath

1. Kohler K-2272-4 Portrait wall mounted lavatory, white vitreous china, 4" centers. Provide carrier/wall hanger.

2. Kohler K-10272-4 Forte Centerset lavatory faucet, ceramic disc valves, 1.5 GPM aerator, metal pop-up drain assembly, brushed nickel finish sculpted lever handles.

3. McGuire chrome P-trap, chrome plated angle supplies with wheel stops and wrought escutcheons. Or reviewed equal.

C. LV-2 Lavatory, Wall Mounted – Office

1. Kohler K-2272-4 Portrait wall mounted lavatory, white vitreous china, 4" centers. Provide carrier/wall hanger.

2. Kohler K-393-N4 Devonshire Centerset lavatory faucet, ceramic disc valves, metal pop-up drain assembly, polished chrome finish lever handles.

3. McGuire chrome P-trap, chrome plated angle supplies with wheel stops and wrought escutcheons. Or reviewed equal.

D. LV-3 Lavatory, Counter Residence Full Bath

1. Kohler K-2209 Caxton undercounter lavatory with overflow, 15" oval, vitreous china, undermount with clamps, rear drain, color "white".

2. Kohler K-16102 Revival widespread lavatory faucet, ceramic disc valves, 1.5 GPM aerator, metal pop-up drain assembly, brushed nickel finish scroll lever handles.

3. McGuire chrome P-trap, chrome plated angle supplies with wheel stops and wrought escutcheons. Or reviewed equal.

4. Provide and install Shroud/Knee Contact Guard.

E. SH-1 Shower, Senior, Residential

1. Provide drain / trap. (Walls, floor, tile, grab bars, soap dishes, shower curtain rod, rings, curtain, etc. by G.C.).

2. Kohler model K-679-KS thermostatic valve with K-T16239 Margaux thermostatic trim, cross handle, brushed nickel.

3. Bradley model A36 ADA hand shower with 36" slide grab bar, 60" flexible hose, vacuum breaker, 2.5 GPM head.

F. SK-1 Sink, Single Bowl, kitchen, Custom

1. Soapstone Bowl supplied by G.C.

2. Kohler model K-596 Simplice Pull-down Kitchen Sink Faucet, color black matt, escutcheon plate, single hole, ceramic disc cartridge, 15" high arc spout, Provide model 1167290 high flow kit. Suggest considering model 1012715 Deep Roughing Kit if installing through a soapstone sink (and/or counter) thicker than 2-1/2".

3. In-Sink-Erator Evolution series, model Excel food waste disposer, 1 hp, 120V, 10.2A, autoreverse grind system, Soudseal Plus technology, anti-vibration mount, 7 year warranty.

4. Provide P-trap compatible with waste disposal. chrome plated angle supplies, wheel stops, wrought (not bell) escutcheons. Or reviewed equal.

G. SK-2 Sink, Bar

1. Kohler model K-3349-1 Toccata self rimming entertainment sink, stainless steel , 15"x15"x7" deep bowl, 19 gauge, type 302 SS. Kohler model K-8801 Duostrainer. Or reviewed equal by Elkay.

2. Kohler model K-6665 Wellspring Beverage faucet, brass body, single lever, ceramic disc cartridge, 8-3/4" high arc spout, chrome, 1.6 GPM.

3. McGuire 1-1/2" chrome brass P-trap, chrome plated angle supplies, wheel stops, wrought (not bell) escutcheons. Or reviewed equal.

H. WC-1 Water Closet, Residence Full Bath

1. Kohler model K-3811 Santa Rosa Comfort Height ADA toilet, 16-1/2", Elongated, vitreous china, 1.6 GPF, Ingenium flushing system, one piece, bolt caps, fully glazed trapway, color "white", with seat and cover; Brushed Nickel trip lever.

2. McGuire chrome water closet supply with wheel handle stop. Or reviewed equal.

3. Install water closet solidly to floor; any wobbly water closets will be redone and all costs, direct and incidental, paid for by this contractor.

I. WC-2 Water Closet, Office

1. Kohler model K-3591-U toilet, elongated, vitreous china, 1.6 GPF, Ingenium flushing system, two piece, bolt caps, fully glazed trapway, Insuliner, color "white".

2. Kohler K-4636 open front toilet with seat and cover, white.

3. Polished Chrome trip lever.

4. McGuire chrome water closet supply with wheel handle stop. Or reviewed equal.

5. Install water closet solidly to floor; any wobbly water closets will be redone and all costs, direct and incidental, paid for by this contractor.

J. WC-3 Water Closet, Residence Half Bath

1. Kohler model K-3591-U toilet, elongated, vitreous china, 1.6 GPF, Ingenium flushing system, two piece, bolt caps, fully glazed trapway, Insuliner, color "white".

2. Kohler K-4636 closed front toilet with seat and cover, white.

3. Brushed Nickel trip lever.

4. McGuire chrome water closet supply with wheel handle stop. Or reviewed equal.

5. Install water closet solidly to floor; any wobbly water closets will be redone and all costs, direct and incidental, paid for by this contractor.

K. WD-1 Clothes Washer/Dryer

1. Appliances are not provided by this Plumbing contractor.

2. Guy Gray recessed supply and drain unit for automatic washers, ½" Watts Duo-cloz valve, 2" drain, white enameled steel. Or approved equal.

3. Provide two (2) PPP Laundry Mini water hammer arresters. Or approved equal.

4. Provide two (2) 60" Braided Stainless Washing Machine Hoses.

5. Provide Dura-Pan 30"x32" molded fiberglass washer pan with center outlet and removable stainless steel front. Or approved equal.

2.12 PLUMBING SPECIALTIES, WATER

A. Hose Bibs (HB)

1. Type "1" Exterior Hose Bib

Zurn Z1345 Wall faucet "Anti-Siphon" automatic draining, integral vacuum breaker, non-freeze wall hydrant. Or reviewed equal.

B. Shock Absorbers (SA)

Shock protection shall be provided where shown on drawings and at all quick closing devices. Devices shall be stainless steel shell, welded expansion bellows surrounded by on-toxic mineral oil or gas, pressurized compression chamber

charged and factory sealed, all, in-line design, threaded nipple and PDI reviewed. Sized to meet the conditions.

1. Type “1”, 'A' P.D.I. units

   Zurn Z-1700, #100. Or reviewed equal.

C. Thermometer (T)

Units to be dial type, 4.1/2” with 30° to 180° range; Trerice Universal angle or reviewed equal.

D. Pressure Gauge (P.G.)

Furnish and install pressure gauges with gauge cocks on piping where shown on drawings. The dial range shall be such that the normal pressure shall be approximately mid-way of dial. Gauges shall be Trerice No. 600 or equivalent by Weiss or Nurnburg, 4.1/2” dial size, cast aluminum case, with brass “T” handle cocks and No. 872 bronze pressure snubbers on water units.

E. Vacuum Relief Valve

Watts Model N36 or reviewed equal.

F. Backflow Preventers (BFP)

Provide and install all necessary components to provide protection against potentially hazardous backflow or back siphonage and the contamination of the potable water system at the required GPM demand. Unit shall be UL, USC, ASSE, 1APMD and AWWA approved.

1. Type “1”, Entrance

   Watts 007M3QT-S double check backflow preventer, ¾”, quarter turn full port ball valves, strainer. Or reviewed equal.

2. Type “2” Mechanical Equipment

   Watts #9DM2 double check with atmospheric port, or reviewed equal.

G. Mixing Valves (MV)

1. Type "1" Master Mixer

   Leonard model 220 thermostatic mixing valve, inlet size 1/2”, outlet size 1/2” capacity 5.5 @ 10 psi differential pressure for exposed piping, solid bi-metal thermostat scale hot to cold, rough bronze, check stops, set at 130°F. Or reviewed equal.

H. Expansion Tank

Watts Model DET-5-M1. Potable water expansion tank, 2.1 gallon, 0.85 gallon

acceptance, 3/4” connection, precharged to 40 psi. Or reviewed equal.

I. Relief Valve

Watts #530 calibrated pressure relief valve. Set at 100 PSI. Or reviewed equal.

J. Braided Stainless Steel Water Connectors

EPDM tubing jacketed by type 304 stainless steel braid, stainless ferrule, brass nuts. By Zurn or reviewed equal.

K. Dielectric Unions

Series 3000 as manufactured by Watts or reviewed equal.

L. Meters

Provide two meter. A main meter that meets the criteria of the local water district and has remote reader, and a submeter for the Office Spaces, for local use.

2.13 PAINTING

Painting shall be provided for all steel/iron equipment supports, steel/iron fuel piping, exposed flanges, fittings and valves within boiler rooms, basements and outside and where specified elsewhere within this section. Painting shall consist of no less than two (2) coats of rust inhibiting paint, Rust'O'leum or approved equal. Paint shall be capable of withstanding temperatures of up to 250^{o}F.

2.14 WATER HEATER (WH)

A. Type 1, Indirect

By Mechanical Contractor, see Mechanical drawings.

B. Type 2, Point of Use Electric Water Heater, Lavatory

Eemax model EX55T Thermostatic Electric Instantaneous Water heater, 10 year warranty, 240 V, 5.5 KW, 23A, single phase. 75 deg Rise at 0.5 GPM. Set for 120 deg. Or reviewed equal.

C. Type 3, Point of Use Electric Water Heater, Bar Sink

Eemax model EX95T Thermostatic Electric Instantaneous Water heater, 10 year warranty, 240 V, 9.5 KW, 40, single phase. 65 deg rise at 1 GPM. Set at 120 to 130 deg. Or reviewed equal.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

Prior to all work of this section, carefully inspect the existing conditions, demolition and installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

3.02 COORDINATION WITH OTHER TRADES

Before installation, participate in a coordination meeting to establish and resolve areas of conflict and congestion. Priority to be given to HVAC equipment and large ductwork, then gravity piping, then small ductwork, then piping based on descending order of size. Special consideration given to allow access to valves, dampers etc. Failure to coordinate will result in this contractor removing and relocating his piping at no additional expense to the owner.

3.03 INSTALLATION OF PIPING AND EQUIPMENT

A. General

1. Install all piping promptly, making pipe generally level and plumb, free from traps, and in a manner to conserve space for other work.

2. Install pipes to clear all beams and obstructions. Do not cut into or reduce the size of load carrying members without the approval of the Architect.

3. Plumbing vents

   a. Back vent all plumbing fixtures.
   b. Pitch all vents at 1/64” per foot minimum toward waste lines for proper drainage to prevent unintended traps.
   c. Install vent piping with each bend 45 degrees minimum from the horizontal, wherever structural conditions will permit.
   d. Group plumbing vents and take through roof as shown.
   e. Increase vents 3” and smaller one size before going thru roof. Make size transition a minimum of 12” below the surface of flat roofs and 72” (or as structure permits) below sloped roofs.
   f. Terminate 12 to 18” above roof.
   g. If installing in locations other than as shown on the drawings, line up with other plumbing vents for a neat appearance.
   h. Do not install plumbing vents within 10 feet of an operable window or door or within 25 feet of a ventilation air intake.

4. All risers and off-sets shall be substantially supported.

5. Pipe hangers shall be placed on center as follows:

MATERIAL	HORIZONTAL	VERTICAL
Cast-iron	At joints not to exceed 10'	15' or at each story whichever is less, and stacks at the base
Copper 1-1/4" & less	6'	6'
1-1/2"	6'	10'

2" & up	10’	10'
PVC, DWV	4’	4'
Steel	10’	10'

6. Make all changes in pipe size with reducing fittings.

7. All low points in water piping shall be drained with ½” gate valve with hose nipple and metal cap.

8. No piping shall be installed in such a manner to permit back-siphonage or flow of any liquid in water piping under any conditions.

9. No water piping shall be installed outside of building or in an exterior wall unless adequate provisions are made to protect such pipe from freezing.

10. All piping and drain openings left unattended will be capped, plugged or securely covered to prevent accidental entry of foreign matter.

B. Joints and Connections

1. Smoothly ream all cut pipe; cut all threads straight and true; apply best quality Teflon tape to all male pipe threads but not to inside the fittings; use graphite on all clean out plugs. DO NOT use Teflon tape on gas piping.

2. Smoothly ream all cut P.V.C. pipe. Clean and use solvent for fitting connection and in strict accordance with the manufacturer’s recommendations.

3. Make all joints in copper water tube with solder applied in strict accordance with the manufacturer’s recommendations.

3.04 STERILIZATION AND FLUSHING OF PIPES

A. After preliminary purging of the system, chlorinate the new potable water system in accordance with the current recommendations of the American Water Works Association, and in accordance with all pertinent codes and regulations. Chlorinate only when the building is unoccupied. Upon completion of the sterilization, thoroughly flush the entire potable water system.

3.05 TESTING OF PIPING

Tests shall be applied to the plumbing installation as required by codes and where as directed by the Architect, and in all cases before work is covered by earth fill or pipe covering.

A. Sanitary piping shall be tested when all underground work is complete (before covering) and again, after all piping is installed, but before it is further closed in. Sanitary systems shall be securely stopped, except at the highest point, and the entire system filled with water to the point of overflow for 24 hours. All leaks shall be repaired. Cracked pipes and fitting shall be removed and replaced. No doping of soil pipe or fittings will be allowed. Plan testing around expected weather and temperature conditions or provide protection so that pipes do not freeze.

B. New domestic water piping shall be filled and subjected to a hydrostatic pressure test of 150 psi for 8 hours with no leaks. If leaks are detected they shall be repaired and the test repeated until work is tight. NOTE: Testing with compressed air only is NOT ACCEPTABLE.

C. Testing of Fuel Gas piping shall conform to NFPA 54. Testing of natural gas piping shall also conform to the requirements of the gas supplier.

3.06 CLEANING

A. Prior to acceptance of the buildings, thoroughly clean all exposed portions of the this installation, removing all labels and all traces of foreign substance, using only a cleaning solution approved by the manufacturer of the plumbing item, being careful to avoid all damage to finished surfaces. Additional attention may be required to thoroughly clean any used, re-used or owner provided fixtures.

B. Clean out all strainers and aerators and adjust or replace washers, cartridges, etc

3.07 HAZARDOUS MATERIALS

Mercury or any other material deemed by the Federal Environmental Protection Agency or the State Department of Environmental Protection to be hazardous shall not be used in any components of the plumbing systems.

END OF SECTION

SECTION 23 00 00 - MECHANICAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Attention is directed to PART A, Division 00 and PART B, Division 01, as listed in the TABLE OF CONTENTS, which are hereby made part of this Section by reference thereto.

1.02 ALTERNATES

There are no alternates that apply to this section of the project.

1.03 DEFINITIONS

ATC Automatic Temperature Control
EC Electrical Contractor (Electrical Division)
GC General Contractor
HC Heating (mechanical) Contractor
PC Plumbing Contractor

1.04 DESCRIPTION OF WORK

A. Work Included

1. Furnish all labor, materials, equipment, transportation and perform all operations required to install a complete heating, ventilating and air conditioning system in the building, in accordance with these specifications and applicable drawings.

2. All temperatures are expressed in degrees Fahrenheit.

3. Disconnect, cap and make safe all existing heating system components prior to demolition, removal and disposal by the General Contractor or its demolition subcontractor.

4. Work to be performed shall include, but is not limited to, the following:

a. Provide and install warm air heating systems.
b. Provide and install direct expansion air conditioning systems.
c. Pipe, valve and fittings
d. Hot water specialties
e. Circulating pumps and boiler work
f. Condensing units
g. Air handling unit and Furnace
h. Bathroom exhaust fans
i. Clothes Dryer Exhaust System
j. Piping and Ductwork Insulation
k. Kitchen Range exhaust ductwork.

l.. Sheetmetal
m. PVC gas furnace and boiler vent and combustions air.
n. Automatic Temperature Control (ATC)
o. Tests and balance

5. Specifications and accompanying drawings do not indicate every detail of pipe, valves, fittings, hangers, ductwork and equipment necessary for complete installation; but are provided to show general arrangement and extent of work to be performed.

6. Before submitting proposal, Mechanical Contractor shall be familiar with all conditions. Failure to do so does not relieve Mechanical Contractor of responsibility regarding satisfactory installation of the system.

7. Mechanical contractor shall be responsible for rigging to hoist his own (and his sub-contractors') materials and equipment into place.

8. Mechanical contractor and his sub-contractors shall be responsible for start-up of all equipment provided under this section.

1.05 PERMITS

A. This Contractor shall be responsible for providing and filing all Plans, Specifications and other documents, pay all requisite fees and secure all permits, inspections and approvals necessary for the legal installation and operation of the systems and/or equipment furnished under this Section of the Specifications.

B. The Contractor shall frame under glass/ clear plastic all permits, secured by him, adjacent to the respective system and/or equipment and required to be displayed by Code, law or ordinance. Those permits secured but not required to be displayed shall be laminated in plastic and included in the Owner's maintenance manual.

1.06 CODES, ORDINANCES AND PERMITS

A. All work performed under this Section of the Specifications shall be done in accordance with applicable National, State and local Codes, Laws and Ordinances. The following abbreviations are used for reference to standards which are to be followed:

AABC	Associated Air Balance Council
ADA	Americans With Disabilities Act
AMCA	Air Movement & Control Association
ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BOCA	Building Officials and Code Administrators
NEC	National Electrical Code
NFPA	National Fire Protection Association

NEMA	National Electrical Manufacturer's Association
OSHA	Occupational Safety and Health Act
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
UL	Underwriter's Laboratories

B. The latest issue of each Code in effect at the time of bidding shall be used. Code requirements are the minimum quality and/or performance acceptable. Where the Specifications and/or Drawings indicate more stringent requirements, these requirements shall govern.

1.07 QUALITY ASSURANCE

A. Qualification of Workpersons

Use sufficient qualified workpersons and competent supervisors in execution of this portion of the work to ensure proper and adequate installation of system throughout.

B. Work performed shall conform with all Local and State Rules and Regulations, as well as those of the National Fire Protection Association (N.F.P.A.).

1.08 MATERIALS AND SUBSTITUTIONS

All materials and equipment shall be new and of the latest design of respective manufacturers. **All materials and equipment of the same classification shall be the product of the same manufacturer**, unless specified otherwise.

A. Any proposal for substitution of Mechanical equipment, materials or vendors shall be made in writing PRIOR TO OPENING OF BIDS, see Division 1. Submit full details for consideration and obtain written approval of the Architect. The phrase "or approved equal" shall be defined to mean that the Architect, not the contractor, shall make final determination whether or not substitute materials are an equal to that which is specified. The contractor shall be responsible to certify within his submittals that any equipment to be considered as an "approved equal" meets or exceeds the requirements of this specification in all aspects and will physically fit within the space provided and still provide adequate space adjacent to the equipment for service. If requested by the Architect the contractor shall provide said certification in the form of scale drawings before review will be made. Architect will not be responsible to provide drawings for substituted materials unless the substitution is agreed upon prior to opening of bids. Architect's decision on acceptability of substitute materials shall be final.

B. Approval by Architect for such substitution shall not relieve Mechanical Contractor from responsibility for a satisfactory installation and shall not affect his guarantee covering all parts of work

C. Any material or equipment submitted for approval which are arranged differently or is/are of different physical size from that shown or specified shall be accompanied by shop drawings indicating different arrangements of size and method of making the various connections to equipment. Final results will be compatible with system

as designed.

D. Materials and equipment determined as an “approved equal” and/or substitutions must meet the same construction standards, capacities, code compliances, etc. as the equipment (i.e. Manufacturer, model, etc.) specified.

E. Any additional cost(s) resulting from the substitution of equipment, regardless of acceptance by the Architect or Engineer, shall be paid by this Contractor. Additional costs may include, but not be limited to, electrical and/or structural alterations from the contract documents. Contractor shall be solely responsible to verify that substitutes will fit within the designated spaces provide while permitting adequate clearances for servicing of equipment as required by the manufacturers. Contractor shall, upon request from the Architect or Engineer of record, provide such verification of ample space and clearances in the form of drawings or any other manner requested.

F. All materials not specified otherwise shall be manufactured within the United States and supplied locally (within the State of Maine) when available. It is preferable to obtain materials that are manufactured within 500 miles of the work site when practical.

1.09 PLANS AND SPECIFICATIONS

Mechanical Contractor shall provide his sub-contractors with a copy of the ENTIRE portion of Part 1 of this specification, portions of this specification and copies of drawings which pertain to the equipment to be supplied at no cost to the sub-contractor. Provide ATC Contractor with entire set of Electrical plans and specifications. Provide Testing and Balancing sub-contractor with copies of shop drawings indicating coil gpm’s, air handling unit air volumes, etc. Failure to do so may result in the Architect providing the required materials at the Contractor’s expense.

1.10 ELECTRONIC DRAWINGS AND FILE SHARING

Plans and specifications may be made available in electronic format on request. Plans may be provided in either Adobe (.pdf) or CAD (.dwg or .dxf) formats and will be compressed using WinZip (.zip format). Recipient is responsible to obtain the necessary software to open the files. Note: CAD (.dwg and .dxf) files will be made available to successful bidders only after a contract is awarded.

CAD drawings are produced with AutoCAD 2006 and may be provided in either the 2000 or 2004 file formats. Upon request for CAD files a release form will be provided which must be signed and returned to the Engineer prior to transmission of electronic files. Physical mailing address, telephone numbers and e-mail address for this office are indicated on each drawing. A signed release will not be required for Adobe based files.

All contract documents are copyrighted material. No portion of materials may be reproduced or duplicated except as indicated in the release form. Where release forms are not required (Adobe based files), materials may be printed for use by the intended recipient only and may not be reproduced or copied in any other manner or for any purpose other than for use pertaining to the construction of this project unless written permission is obtained.

1.11 SHOP DRAWINGS & SUBMITTALS

A. As soon as possible after award of contract (but not longer than 21 calendar days), before any material or equipment is purchased, Mechanical Contractor shall submit shop drawings to the Architect for review. The quantity of copies shall be as outlined in Division 1. If shop drawings are not submitted within the allotted time frame all substitutions included in the late shop drawings will be invalid and the equipment primarily specified must be provided. Any costs resulting from delays in the project schedule due to failure to submit shop drawings related to this section in a timely manner shall be the responsibility of the Mechanical Contractor. Contractor's name, address, telephone and fax numbers shall be provided with every shop drawing submission. Shop drawings shall be properly identified and shall describe in detail the material and equipment to be provided, including all dimensional data, performance data clearly indicated, fan curves, pump curves, computer selection print-outs, etc. Capacities indicated are minimums. Equipment submitted with capacities below specified parameters will be refused.

B. Corrections or comments made on the shop drawings do not relieve the contractor from compliance with requirements of the drawings and specifications. Shop drawing review is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades and performing his work in a safe and satisfactory manner.

C. Should any materials or products be purchased and/or installed without prior review and comment the contractor shall be required to remove or replace those products and/or materials if directed by the Architect at his own expense. If the materials are not removed (or replaced) or if the project is delayed as a result the Architect reserves the right to order the withholding of payment until the situation is resolved in a manner satisfactory to the Architect.

D. Mechanical shop drawings shall be separate from Plumbing shop drawings. Submittals not separated from plumbing shop drawings will be refused for re-submittal.

E. Shop drawings must be original documents or good quality photocopies of original documents (photocopies of color samples are not acceptable). Faxed copies of submittal sheets will be refused unless prior arrangements are made. However, submitting shop drawings electronically in.pdf format is encouraged. Electronic files must be accessible and in an open format, meaning files must not be locked and comments may be added without altering the original content, or have interactive fields intended specifically for commenting. Locked files will not be reviewed.

F. Review must be obtained on the following items:

1. Ductwork and Accessories

    a. Registers, diffusers, and grilles

b. Duct access doors
c. Volume control dampers (manual and automatic)
d. Duct sealant
e. Turning vanes
f. Side takeoff (bellmouth) fittings
g. Flexible duct
h. Backdraft dampers
i. Manual dampers
j. Filters

2. Mechanical Equipment (sound data must be provided with all interior motorized equipment).

a. Full warrantee information must be included with all submittals.
b. Air Handling units and accessories - provide curves for fan wheels submitted and computer selection printouts.
c. Condensing Units.
d. Fans and accessories - provide full fan curves and computer selection printouts.
e. Furnace
f. Pumps and accessories - provide full pump curves and computer selection printouts.
g. Boiler unit and accessories, confirmation of start-up
h. Equipment identification tags

3. Piping and Accessories

a. Pipe, valves, unions and flanges
b. Balancing valves with read-out gauge and pressure tappings. Provide a schedule clearly indicating every valve, its location, GPM, size and pressure drop.
c. Air vents (automatic and manual)
d. Air separator
e. Relief valves
f. Expansion tank and accessories
g. Flow control valves
h. Backflow preventer
i. Flow control valves
j. Pipe hose assemblies

4. Terminal Units

a. Hot water heating coils - provide computer selection printouts.

5. Insulation

a. Pipe
b. Duct
c. Pipe fittings

6. Automatic Temperature Control (ATC) System

1.12 PRODUCT HANDLING

A. Protection

Use all means necessary to protect heating, ventilating and air conditioning materials before, during and after installation and to protect the installed work and materials of all other trades.

B. Replacements

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

1.13 AS-BUILT DRAWINGS

Keep in good condition at the job, apart from all other prints used in actual construction, one complete set of all blueprints furnished for this job. On this special set of blueprints, record *completely and accurately* all differences between the work as actually installed and the design as shown on the drawings. These record prints must be kept up to date by recording all changes within one week of the time that the changes are authorized. At the completion of the work, this set of drawings shall be delivered to the Architect for the Owner electronically in the form of CAD drawings. If a complete record of changes is not made and electronic CAD drawings not provided by the Mechanical Contractor, a record shall be made by the Engineers, and *the cost of the record shall be paid by the Mechanical Contractor*. Copies of the mechanical CAD drawings may be made available to the Mechanical Contractor if desired. Drawings shall be dated accordingly and clearly identified as "AS-BUILT". See par. 1.10, "ELECTRONIC DRAWINGS AND FILE SHARING" for additional information.

1.14 MAINTENANCE MANUAL

A. On completion of this portion of the work, and as a condition of its acceptance, submit for approval two copies of a manual describing the system. Mechanical equipment manuals shall be separate from plumbing manuals. All manuals shall be original copies, not photocopies or they will be refused for re-submittal. Prepare manuals in durable 3-ring binders approximately 8½ inches by 11 inches in size with at least the following:

1. Identification on the front cover and spine stating general nature of the manual.
2. Neatly typewritten index.
3. Complete instructions regarding operation and maintenance of all equipment involved.
4. Complete nomenclature of all replaceable parts, their part numbers, current cost, and name, address and telephone number of nearest vendor of parts.
5. Copy of all guarantees and warranties issued.
6. Where contents of manuals including manufacturer's catalog pages, clearly indicate the precise item included in this installation and delete, or otherwise clearly indicate, all manufacturers' data with which this installation is not

concerned.

B. In addition to above, provide two (2) separate offset style binders properly identified, each containing a copy of all reviewed shop drawings and catalog cuts. (NOTE: May be incorporated in Maintenance Manuals, if binders are of adequate size.)

1.15 OBJECTIONABLE NOISE AND VIBRATION

Mechanical equipment shall operate without objectionable noise and vibration. Should objectionable noise or vibration be transmitted to any occupied part of the building by apparatus, piping or ducts, as determined by the Architect, the necessary changes eliminating the noise or vibration shall be made by this Mechanical Contractor at no extra cost to the Owner.

1.16 GUARANTEE

This Contractor shall guarantee all materials and workmanship furnished by him or his sub-contractors to be free from all defects for a period of no less than one (1) year from date of final acceptance of completed system and shall make good, repair or replace any defective work which may develop within that time at his own expense and without expense to the Owner. Any additional costs required to extend manufacturer's guarantee and warranty for the period specified, shall be included in Contractor's base bid.

1.17 MINOR DEVIATIONS AND DISCREPANCIES

A. The drawings are intended to indicate only diagrammatically the extent, general character and approximate locations of mechanical work. Work indicated, but having minor details obviously omitted, shall be furnished complete to perform the functions intended without additional cost to the Owner. Follow the architectural, structural, plumbing and electrical drawings so that work under this section is properly installed and coordinated with other Sections.

B. The drawings and specifications are complimentary to each other and what is called for in one, shall be as binding as if called for by both. In the event of conflicting information on the mechanical drawings, or between drawings and specifications, or between trades, that which is better, best or most stringent shall govern.

C. Questions to the Architect or Engineers are encouraged, but any answers or advice is non-binding. Therefore, inquires about such items should be made at least 4 days prior to when bids are due to allow time for a clarifying addendum to be issued.

D. Any conflicts arising from duplication of equipment specified in different portions of the specifications shall be brought to the attention of the Architect prior to submitting bids. Failure to do so does not relieve the Contractor from responsibility of providing said materials and equipment and a credit will be taken for the duplicated item(s).

1.18 CHANGE ORDERS

A. No change shall be made from the work, equipment, or materials under this section except as directed in writing by Engineer.

B. All requests for change in contract price and scope shall be accompanied by a breakdown list of materials with unit and extended prices and labor hours with unit and extended price, plus markups that have been applied.

1.19 COORDINATION

A. Contractor shall be responsible to coordinate his work with that of other trades to adjust to field conditions prior to commencing work. If a reasonable solution cannot be achieved without compromising the integrity of the intended design or would result in additional cost the Architect must be notified immediately prior to commencement of work. Failure to do so does not relieve the Contractor from providing and installing the systems to the satisfaction of the Architect at no additional cost.

B. Contractor shall be responsible to review job conditions and identify conflicts and/or obstructions to ductwork and piping prior to fabrication. If conflicts and/or obstructions are noted the Architect must be notified immediately prior to commencement of work. The cost of any fabrication work performed without confirmation and notification of conflicts and/or obstructions shall be the responsibility of the contractor.

1.20 INFORMATION

Requests for Information (RFI) or other correspondences which are submitted electronically must be in an open format, meaning files must not be locked and comments may be added without altering the original content, or have interactive fields intended specifically for commenting. Locked files will not be accepted.

1.21 WORKPLACE SAFETY

Mechanical contractor shall be responsible for the safety of his workpeople.

PART 2 - PRODUCTS

2.01 PIPING

A. General

Provide and erect in accordance with best practice of trade all hot water supply and return, chilled water supply and return, low pressure steam, condensate return, pump discharge, drain and vent piping shown on the plans and as required to complete intended installation. Contractor shall make offsets as shown or required to place all piping in proper position to avoid other work, and to allow application of insulation and finish painting.

B. Pipe Materials:

1.	Heating hot water	Schedule 40 standard weight black steel, ASTM 120 or type “L” copper

2.	Cold water, drains from relief valves and automatic vents.	Type "L" hard drawn copper tubing
3.	Refrigerant Piping	Type "K" Hard drawn copper
4.	Gas Boiler Vent Piping	PVC Schedule 40 plastic

C. Pipe Fittings:

1.	Screwed	125# cast iron screwed pattern ASTM A126, ASA B16.1
2.	Sweat	Cast bronze or wrought copper made up with 95-5 solder
3.	Connections to equipment	2inches and smaller - screwed unions 2½ inches and larger – flanged
4.	Dielectric fitting	Steel or copper pipe to ASTM A-53, zinc electroplated body with non-corrosive thermoplastic lining, thread connections. Victaulic Style 47-TT or approved equal.

D. Steel piping 2 inches and smaller shall have screwed connections. All threads on piping must be full length and clean-cut with inside edges reamed smooth to the full inside bore.

E. The Mechanical Contractor may, at his option, use type "L" hard drawn copper tube for piping 2 inches and smaller in lieu of steel within the building. If copper is to be used, the piping system shall be 100% copper with no mixture from copper to steel.

F. Use dielectric fittings when connecting dissimilar metals.

G. Refrigerant piping. All refrigerant piping to be done per manufacturers recommendations.

1. All piping to be brazed or mechanical joints.

2. A flow of nitrogen is required through the piping during brazing operations.

2.02 VALVES

A. General

1. Valves shall be provided as shown and as required to make the installation and its apparatus complete in operation, locate to permit easy operation, replacement and repair. All pressures specified are steam working pressure.

2. All valves must be so constructed that they may be repacked under pressure while open.

3. Globe valves shall be installed in all lines where regulation is required.

4. Check valves shall be installed in all lines where flow may reverse from intended direction.

5. Except for above or as otherwise noted on drawings, ball valves shall be installed in all water supply and return lines and on all drain lines.

6. All valves to comply with federal specifications and be so listed.

7. All valves 2½ inches and larger shall be O.S.&Y. type with exception to ball valves.

8. Gate valves shall be installed in all steam and condensate piping. Ball valves shall not be used for steam or condensate service.

9. Butterfly valves shall not be used.

B. Types and Manufacturers

All valves shall be of one manufacturer and by one of the manufacturers listed. The following list is provided as a means of identifying the quality and type required.

1. Ball valves 2 inches in size and smaller shall have bronze bodies, Type 316 stainless steel stems and balls, reinforced Teflon seats an seals, blow-out proof stems and adjustable stem gland. Shall be equipped with suitable packing for service intended. Ports shall be "full port". Rated for 400# WOG and 350°F:

	Soldered Ends	Screwed Ends
Milwaukee	BA-350S	BA-300S
Apollo	82-200	82-100
Watts	B-6081	B-6080
NIBCO	------	------
Hammond	8614	8604

2.03 INTERIOR HANGERS AND SUPPORTS

A. General

1. All interior hangers and supports shall be specially manufactured for that purpose and shall be the pattern, design and capacity required for the location of use.

2. Piping specified shall not be supported from piping of other trades.

3. Hangers shall be steel, adjustable clevis type; plain for steel pipe and copper

plated for copper tubing. Carpenter & Paterson, Inc., Fig. 100 (Fig. 100 CT copper plated) or approved equal. Hangers on hot water and drain piping shall be sized for the piping only (not including insulation). Hangers on cold water piping, and where specifically indicated on drawings, shall be sized to include the insulation and include thermal hanger shields (insulated pipe supports).

4. Thermal hanger shields shall be Carpenter & Paterson, Inc., Fig. 265P or approved equal.

5. Exposed vertical risers ¾ inch and smaller shall be supported at the mid-point between floor and ceiling with split ring type hangers; copper plated for copper tubing. Carpenter & Paterson, Inc., Fig. 81 (Fig. 81 CT copper plated) or approved equal.

6. Attachments to wide flange steel members shall be adjustable beam clamp, Carpenter & Paterson, Inc., Fig. 82 or approved equal.

7. Piping suspended from walls, trench walls and partitions shall be supported by steel support bracket. Carpenter & Paterson, Inc., Fig. 69 or approved equal.

B. Hanger Rods

1. Hanger rods shall be galvanized all thread rod. Rod size shall be as follows:

Pipe Size	Rod Size
½" to 2"	3/8"

2. Provide toggle bolts for fastening to concrete blocks and compound anchor shields for bolts for fastening to poured concrete.

3. Provide lag points with rod couplings or side beam connectors with drive screws for fastening to wood.

4. All nuts for hanger rod to be stainless steel.

C. Supports

Provide and install angle iron supports for pipe hangers as required. Angle iron supports shall be adequate size for span and piping or equipment load.

2.04 PIPE SLEEVES AND ESCUTCHEONS

A. Interior Sleeves

1. Mechanical Contractor shall set sleeves for all piping penetrating interior concrete and masonry walls and floors. Sleeves shall be schedule 40 steel pipe, two sizes larger than the carrying pipe. Pipes passing through walls and floors of frame construction need not be provided with sleeves.

2. Sleeves set in floors shall finish flush with the underside, but extend a minimum of 1 inch above the finish floor. Sleeves set in walls shall finish flush with each side. General Contractor shall grout between sleeves and surrounding masonry.

3. Spaces between sleeves and pipes shall be sealed fire and smoke tight. Spaces between pipes and floors and between pipes and fire rated walls in frame construction shall also be sealed fire and smoke tight. Sealant material shall be 3M brand fire barrier caulk CP25 or putty 303, Ciba-Geigy CS240 Firestop Sealant, or approved equal and shall be U.L. listed.

B. Escutcheons

Where uninsulated piping passes through finish walls, floors, ceilings and partitions, provide and set two piece nickel plated steel floor and ceiling plates. Provide deep type floor plates as required for projecting sleeves. Piping through walls with insulation shall not require escutcheons.

2.05 ANCHORS

Anchors shall be provided and installed as detailed and shown on the drawings, or as required to control expansion.

2.06 HOT WATER SPECIALTIES

A. Coil Valves

All coils shall be provided with ball valve for 125 psig at 250^{o}F. as specified under valves.

B. Drains

Each downfeed radiator, convector, cabinet unit heater, unit heater, coil and unit ventilator shall be provided with a drain valve between the shut-off valves and heating equipment at the lowest point in the piping. All low points in piping mains shall be provided with drain valves. Drain valves shall be ball valves as specified under VALVES with hose connections and metal caps.

C. Air Vents

1. Air vents shall be installed at the equipment, all high points in the piping as indicated on the plans or as may be required.

2. Automatic air vents shall be Taco 409 brass vent with ¾ inch I.D. flexible tube drain. Units by Anderson, Armstrong (No. 1-AV) or Sarco will also be considered. Pet cocks shall be installed with each unit and the drains from the vents shall be run as indicated on the plans. An air chamber shall be installed at each air vent on piping 2 inches and larger piping. Do not use on glycol systems, use manual vents only.

3. Manual air vents shall consist of air chamber with a Dole No. 14A Coin Valve

with copper tube extension. Install valve in accessible location.

4. By-pass type vents shall be installed where shown and as detailed on the drawings. By-pass valves shall be plug-type globe as specified under VALVES.

D. Expansion Tank

Furnish and install vertical pressurized replaceable bladder type water expansion tank pre-charged to 12 psi as shown on the drawings. Tank shall be constructed of steel for 125 psi working pressure in accordance with ASME Code, and have the necessary tappings for water connections and charging valve. Tanks shall be furnished with ASME stamp and certification papers. A copy of ASME certification shall be provided with equipment submittal.

1. Tank shall be installed with a manual shut-off valve between the tank and the system and a union between the tank and the valve.

2. Tank shall be Taco as shown on plans. Units by Bell & Gossett or Wood will be considered. Capacities shall be as shown on drawings.

E. Backflow Preventer

Backflow preventer shall be furnished under Division 22 00 000, "PLUMBING".

F. Water Pressure Reducing Valve

Furnish and install a pressure reducing valve with brass body construction and built-in strainer in the cold water piping connected to hot water heating system as shown on the drawings. The valve shall be adjustable and be No. 335, as manufactured by Taco. Units by Bell & Gossett and Watts will be considered. Provide pressure relief valve with operating pressure 100% over system pressure, but not exceeding 100 psi.

G. Air Separator

Furnish and install air separator, Taco 4900-A series, Bell & Gossett “Rolairtrol” or approved equal. Unit shall be flanged and contain a micro-bubble air removal and strainer system. Unit to be constructed in accordance with A.S.M.E. boiler and pressure vessel code and stamped 125 psig design pressure.

2.07 GAS-FIRED BOILER (B-R)

A. Provide and install a Triangle Tube Model PE 110 natural gas. Substitution requires pre-bid approval from engineer.

B. The boiler shall be rated at the input and output shown on the schedule. The boiler shall modulate 20-100% of full fire.

C. The boiler shall be listed with the U.S. Department of Energy as an Energy Star Appliance. The boiler shall have a minimum thermal efficiency of 94%.

D. The water tube heat exchange shall be stainless steel, rated for 160 psi>. The boiler shall be fully condensing design with built-in condensate drain and trap.

E. The boiler shall be designed for Category IV PVC or CPVC venting.

F. Controls shall have the following

1. Built-in outdoor reset.

2. Monitor flue gas temperature and shall stop boiler from firing if excessive.

3. Accept external modulation signal.

G. Boiler to be supplied with primary water pump and 14 Gallon domestic hot water tank

2.08 DRYER VENT AND KITCHEN DOWNDRAFT DUCT

A. Provide and install all dryer vent piping – all piping to be aluminum. Provide a 4" wall cap with backdraft damper. No Sheetmetal screws allowed. Provide method for removing duct for cleaning. Attach duct to dryer.

B. Provide and install vent piping from downdraft hood to 8" aluminum wall cap with backdraft damper. All ductwork to be rigid 28 gage Sheetmetal. No flexible duct allowed.

2.09 VENT AND COMBUSTION AIR PIPE

Furnish and install as indicated on the drawings PVC gas vent and combustion air. Terminate above roof as recommended by boiler manufacturer. Provide concentric roof termination supplied by boiler manufacturer.

2.10 DUCT HEATING COILS

A. General

Furnish and install, where indicated unit mounted hot water coils by the air handling unit manufacturer.

B. Headers

Water headers shall be seamless copper tubing with intruded tube holes to permit expansion and contraction without creating undue stress or strain. Vent connections shall be provided at the highest point.

C. Tube and Fins

Tubes shall be round, seamless copper tubing brazed into intruder header tube holes using copper brazing alloys, tested at 315 lbs and guaranteed for 250 psig working pressure. Tubes shall be staggered in the direction of air flow. Fins shall be rippled aluminum with full drawn collars to provide a continuous surface cover

over the entire tube. The use of internal restrictive devices to obtain turbulent flow will not be allowed since they prevent complete drainage of the coil.

D. Casing

Casing shall be constructed of continuous galvanized steel with 3/8 inch diameter bolt holes for flange mounting at 6 inch centers. Coil side plates shall also be of continuous galvanized steel of reinforced flange type construction for greater strength.

E. Submittals

Submittals shall include computer selections verifying compliance with scheduled capacities, full drawings of coils and duct connections.

E. Coils shall be by Trane, Carrier, McQuay, or USA Coil or York.

2.11 FURNACE (F-0)

A. Furnace to be Trane model TUX or approved equal by Carrier, York or Lennox.

B. Furnace to be direct vent condensing furnace – Minimum 93% AFUE.

C. Mounted in the horizontal position.

2.12 AIR HANDLING UNIT (AH-R)

A. Air Handling Units to be Trane model 4TEH or approved equal by Carrier, York or Lennox.

B. All air handling unit to be R410A refrigerant system.

C. Provide factory filter rack.

D. Mounted in the upflow position

.

2.13 CONDENSING UNITS (CU-O & CU-R)

A. Condensing units to be Trane model 4TTR or approved equal by Carrier, York or Lennox.

B. All condensing units to be R410A refrigerant system.

C. Condensing units to be a minimum of 13.0 SEER

2.14 FANS

A. Provide install fans as indicated on drawings

1. EF-1 to be a humidity sensing Nutone QTEN110S humidity sensing fan or

equal by Panasonic or Broan

2. EF-2 to be a Nutone QTXEN080 or equal by Panasonic or Broan.

2.15 SHEETMETAL

A. General

The work under this section includes all the required sheetmetal and duct work, extensions for grilles, manual dampers, automatic counterbalanced (backdraft) dampers, deflectors, duct lining, setting of control dampers, grilles, registers, diffusers and flexible connections as shown on the drawings or required to make the installation complete in accordance with the intent of the drawings and specifications.

B. Ducts

1. The size of ducts marked on the drawings will be adhered to as closely as possible. The right is reserved to vary duct sizes to accommodate structural conditions during the progress of the work without additional cost to the Owners. The duct layout is schematic to indicate size and general arrangement only. All ducts shall be arranged to adjust to "field conditions". The Sheet Metal Contractor shall coordinate his work with Electrical Division and other trades.

2. Medium and low pressure ducts shall be constructed of galvanized steel in accordance with the following table of duct sizes OR the latest SMACNA HVAC Duct Construction Standards for Metal and Flexible Duct unless otherwise shown on drawings.

Low pressure ducts:

Dimensions of Longest Side (inches)	Minimum Sheet Metal Gauge
Up thru 12	26
13 --> 30	24

3. Methods of fabrication and installation shall be in strict accordance with guidelines set forth in the latest SMACNA Guide and Data Book for Low and Medium Pressure Duct Construction unless otherwise shown on drawings. Cross break all ducts with largest dimension being 18 inches and larger. Beaded ducts are not acceptable except for ductwork less than 18 inches in either direction.

4. All dampers and deflectors shall be a minimum of #22 gauge and stiffened as required. Splitter dampers shall not be acceptable.

5. All joints in ducts shall be made air tight, and all branches and turns shall be made with long radius elbows and fittings. Long radius elbows are defined as having a centerline radius of 12 times the width of the duct. If long radius

elbows are not used, elbows 18 inches wide and larger shall be provided with fixed double wall airfoil turning vanes designed to reduce the resistance of the elbow to the equivalent of a long radius elbow with a throat radius of not less than duct width. Square elbows less than 18 inches wide shall be provided with single wall turning vanes. Square elbows with outside corners cut at 45^{o} or rounded are not acceptable.

6. All ducts shall be installed with necessary offsets, changes in cross sections, risers, and drops which may be required. They shall be constructed with approved joints and be supported in an approved manner.

7. Round ductwork shall be constructed in accordance with the latest SMACNA HVAC Duct Construction Standards for round and oval duct construction. Ductwork larger than 8 inches in diameter shall employ spiral seams. All turns shall be made with smooth (not segmented), long radius elbows and fittings. All seams shall be type RL-5, grooved seam pipe lock or better. *Lap seams are not permissible*. Gauge thicknesses shall be as outlined in SMACNA for galvanized steel round duct gauge selections for maximum 2 inches w.g. static pressure. Ductwork shall be supported with full wrap-around band and single hanger strap as indicated in Figure 4-4 of the 1985 edition of the SMACNA HVAC Duct Construction Standards handbook.

8. Furnish and install flexible connections on exhaust fans (where indicated), horizontal unit ventilators, horizontal cabinet unit heaters and all Mechanical units. Connections shall be made from Ventglas neoprene coated glass fabric as furnished by Ventfabrics, Inc., or approved equal.

9. Every precaution shall be taken to keep interior of duct system free from dirt and rubbish and to protect all ducts and equipment during construction. At completion, this Mechanical Contractor shall thoroughly clean all equipment to the satisfaction of the Architect.

10. Spaces between ducts and wall or floor construction shall be caulked to make smoke and water tight with 3M brand fire barrier caulk CP25 or putty 303, Ciba-Geigy CS240 Firestop Sealant or approved equal.

11. Testing, Balancing and Leak Testing... See Part 3, EXECUTION

12. Requirements set forth in applicable codes (see part one) shall supercede SMACNA standards.

C. Diffusers, Grilles and Registers

1. Grilles and/or registers shall be installed at all air supply, relief, return and exhaust openings as shown.
   a. Floor Grilles to be cast iron as manufactured by Reggio Register Company
      Black cast iron with scroll design (reggioregister.com).
   b. Wall grilles to be cast iron as manufactured by Reggio Register Company
      Black cast iron with scroll design (reggioregister.com).

c. Ceiling Return GrillesPrice Model 530L. 45 deg. blades at 3/4' spacing.
d. Double Deflection Grilles to be Price double deflection

2. Ceiling Diffusers shall be installed at all air supply openings as shown. All units to be aluminum, except as noted, and provided with white baked enamel finish. The following list is based on model numbers of Price LCMD-6 to establish a standard of quality (if substituting, certified sound criteria shall be included with submittals indicating CFM and NC levels of each diffuser). Anemostat and Titus only will also be considered for review, however, substitutions must conform to the same performance and design characteristics as those primarily specified.

D. Sealing of Ducts

All ductwork shall be sealed with low VOC water based duct mastic, either "MP" (Multi-Purpose), Hardcast "Iron-grip 601", Polymer Adhesive "Airseal #11", or United Duct Seal (United McGill Corp.) water base, latex or acrylic type sealant. All transverse joints to be continuously sealed. Note that, except as noted, oil or solvent based sealants are specifically prohibited for use on this project. Duct tape, in any form or material, is expressly prohibited.

All seams and joints in shop and field fabricated ductwork shall be sealed by applying one layer of sealant, then immediately spanning the joint with a single layer of 3" wide open weave fiberglass tape. Sufficient additional sealant shall then be applied to completely imbed the cloth. All sealants shall be UL rated at no more than flame spread of 5 and smoke developed of 0. At contractor's option Hardcast 1602 sealant tape may be used in lap joints and flat seams.

E. Manual Dampers

1. See Part 3, EXECUTION for installation notes.

2. Manual dampers with smallest dimension 5 inches or less shall be shop fabricated, single 22 gauge blade, 3/8 inch rod, provided with position indicator and locking quadrant.

3. Manual dampers with smallest dimension larger than 5 inches but smaller than 11 inches shall be single blade steel, 16 gauge construction, provided with position indicator and locking quadrant. Unit shall be Ruskin Type MD35 or approved equal.

4. Manual dampers with smallest dimension larger than 11 inches shall be opposed blade steel, 16 gauge construction, linkage concealed in frame, provided with position indicator and locking quadrant. Unit shall be Ruskin Type MD35 or approved equal.

5. Dampers to be installed in aluminum ductwork shall be fabricated of aluminum or isolated from ductwork with rubber grommets between the damper and the duct to prevent oxidation between dissimilar metals.

6. Provide hand quadrants for all manual dampers, Ventline Model 560 or approved equal.

F. Flexible Duct

Provide and install insulated flexible duct where shown on drawings. Ducts 20 inches in diameter and smaller shall be a double lamination of polyester encapsulating a steel wire helix forming an air-tight inner core. The core shall be wrapped in a blanket of fiberglass insulation (R 4.2) and sheathed in a rugged and durable reinforced metallized polyester jacket. Duct shall be class 1, U.L. 181 compliant and rated for not less than 2 inches w.g. positive working pressure. Duct internal diameter shall be same size as diffuser served. Atco UPC 030 or approved equal.

G. Side Takeoff Fittings (for flexible duct)

Provide and install, at all flexible duct branches to diffusers, a bellmouth side takeoff fitting with a manual damper. Fittings shall be pre-manufactured with bell end shall have a ½ inch radius and employ a self-adhesive gasket seal and be pre-drilled for attachment screws. Units with manual dampers shall be heavy duty with bearings and hand quadrants. Fittings shall be anchored to ductwork with *not less than* three (3) screws. Final diameter shall be same size as diffuser served. Units shall be no thinner than 22 gauge, G-90 galvanized steel. Buckley Bellmouth HD-BM, HD-BMD or approved equal by Flexmaster or United Enertech.

2.16 FILTERS

All air handling units, including cabinet unit heaters, shall be provided with a minimum of three (3) sets of filters with pleated media. One set to be used during construction (and replaced by the Mechanical Contractor during construction if required as determined by the Clerk of the Works and/or the Mechanical Engineer). Second set to be installed a minimum of one (1) day and a maximum of three (3) days prior to testing and balancing and/or final inspection. The third set shall be turned over to the Owner in their original unopened shipping boxes for their future use.

Filters shall be Farr 30/30, Air Guard DP-40 or approved equal; 1 inch thick.

2.17 INSULATION AND CONDENSATE PROTECTION

A. General

1. Insulation shall be provided for all new hot water supply and return piping, cold water piping, supply ducts and other insulation where shown on drawings.

2. Insulation systems shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less.

B. Hot Water Supply & Return Piping

1. All new hot water supply and return piping exposed, above ceilings, within

walls, pipe chases or pipe enclosures, shall be insulated with heavy density fiberglass pipe insulation with 450°F. temperature rating and factory applied ASJ jacket. Longitudinal jacket flaps to be secured with flare type stainless steel staples. Cut insulation to include pipe hangers..

Insulation thickness for hot water shall be as follows:

Pipe Size	Insulation Thickness
½" - 2"	1½"

2. All fittings shall be wrapped with fiberglass insulation and covered with a one piece PVC insulated fitting cover secured with flare type stainless steel staples.

3. The ends of insulation on exposed pipes at valves, flanges, unions, etc., shall be finished net with covering to match jacket and secured with mastic.

C. Refrigerant Piping

Refrigerant suction piping shall be insulated with 1 inch Self-Seal Armaflex SS or approved equal. Cover exterior insulation with ultraviolet resistant vinyl sheet outdoor PVC jacket. Material shall be 25/50 rated (flame spread rating of 25 or less and smoke developed rating of 50 or less) flexible, closed cell elastomeric thermal insulation.

D. Duct and Equipment Insulation

1. Insulate the following ducts with 1½ inches thick fiberglass duct wrap with factory applied vapor barrier facing.

   a. All supply ductwork (unless indicated to receive 3” below)
   b. All return ductwork in attic.

2. Insulate the following ducts with 3 inches thick fiberglass duct wrap with factory applied vapor barrier facing:

   a. All supply and bypass air ducts in the attic.

3. Material to carry U. L. label. All laps to be sealed and held in place with adhesive and flare staples. All lap joints to be folded under before stapling so no raw insulation will be showing. On the bottom of ducts 24 inches or wider, mechanical fasteners shall be provided approximately 12 inches O.C.

E. Installation

All insulation work shall be executed by skilled insulation workmen regularly employed in the trade.

2.18 AUTOMATIC TEMPERATURE CONTROL (ATC)

A. General

1. Furnish and install a complete system of electric/electronic temperature control

B. Scope

Control system shall consist of all area thermostats, air stream thermostats, valves, dampers, damper operators, relays, transformers, labor, other accessory equipment as required and a complete system of wiring to fulfill intent of ATC specification. Control shall be provided for, but not limited to the following:

1. Split System Air Conditioning Systems.
2. Furnace and boiler
3. Air Handling Unit Hot water coils.
` 4. Boiler controls
5. Zone Damper and bypass damper Control System

D. Electric Wiring

1. All low voltage and data wiring for installation of temperature controls shall be supplied and installed by the Mechanical Contractor.

F. Instruction and Adjustment

Upon completion of the project, the Temperature Control Contractor shall:

1. Adjust for use by Owner, all thermostats, controllers, valves, damper operators, and relays provided under this section.

2. Furnish two (2) instruction manuals covering function and operation of control systems for use of the Owner's operating personnel. A competent technician shall be provided for instruction purposes.

3. Temperature Control Contractor shall be responsible for balancing return air, exhaust (relief) air and outdoor air dampers on air handling units in order to achieve proper mixed air temperatures.

4. ATC Contractor shall provide a minimum of 2 hours of training to the Owner’s designated personnel in the care and operation of the ATC system. Provide not less than two dated manuals complete with operating instructions and data on components used in the ATC system.

G. Guarantee

Control system shall be guaranteed to be free from original defects in both material and workmanship for a period of not less than one (1) year of normal use and service. This guarantee shall become effective starting the date Architect agrees Owner has begun to receive beneficial use of the system.

H. Hazardous Materials

Mercury, or any other material deemed hazardous by the Federal Environmental Protection Agency or the State of Maine Department of Environmental Protection, shall not be used in any components of the ATC system.

J. Thermostats

1. Space thermostats

a. Thermostats shall be electronic 7-day programmable.

O. Description of Operation

1. System shall be hot water with water supplied from the gas boiler at a maximum of 160^{o}F.

2. Reset Water Control

Reset control will be supplied by boiler manufacturer and installed and wired by mechanical contractor.

5. Fans shall operate as indicated on "FAN SCHEDULE".

7. Air Handling Units and Condensing Units

a. A call for heating will energize the furnace or the air handler.
b. A call for cooling will energize the condensing units and their associated furnace or air handlers

8. Provide and install two 4-zone damper systems with bypass dampers. Damper system to be Honeywell TrueZone, approved equal. System to include a central control panel.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all work is complete to the point where this installation may properly commence.

2. Verify that Mechanical systems may be installed in strict accordance with all pertinent codes and regulations and the approved shop drawings.

B. Discrepancies

1. In the event of discrepancy, <u>immediately</u> notify Architect.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 INSTALLATION OF PIPING AND EQUIPMENT

A. General

1. All piping shall be installed within building insulation.

2. Size and general arrangements as well as methods of connecting all piping, valves, and equipment shall be as indicated, or to meet requirements for complete installation.

3. All pumps shall be supported independently of the piping system.

4. All piping shall be erected to provide for easy and noiseless passage of hot water under all working conditions. Eccentric Inverted eccentric reducing fittings shall be used whenever water pipes reduce in size in the direction of flow. Tee fittings with reduction in the main direction of flow (run) are not acceptable.

5. All hot water mains shall be run level or pitch slightly upward so that no air pockets are formed in piping. Mains shall be set at elevations so runouts feeding heating equipment shall have no pockets where air can collect or automatic vents shall be provided.

6. Where preset balancing valves are used, it is critical that there not be two valves installed in series anywhere throughout the piping system.

7. Provide drains with hose threads and metal caps at all low points in the water piping system.

8. In erection of hot water piping care must be taken to make allowance for expansion and contraction; piping shall be anchored as necessary to control expansion.

9. Runouts to hot water radiation shall be size indicated on plans and shall come off the main downward.

10. Install brass fittings at all points of dissimilar piping connections.

11. Install a sufficient number of unions or flanges to facilitate assembly and disassembly of piping and removal of equipment.

12. Install all piping promptly, capping or plugging all open ends and making pipe generally level and plumb, free from traps, and in a manner to conserve space for other work.

13. Inspect each piece of pipe, tubing, fittings, and equipment for defects and obstructions; promptly remove all defective materials from the job site.

14. Install pipes to clear all beams and obstructions; do not cut into or reduce the size of load carrying members without the approval of the Architect.

15. All risers and offsets shall be substantially supported.

16. Make all changes in pipe size with reducing fittings.

17. All low points in water piping shall be provided with an accessible plug tee or drain valve.

18. All high points in water piping shall be provided with an accessible automatic vent.

19. Maximum spacing of hangers for steel piping shall be as follows:

Pipe Size	Spacing
½", ¾" & 1"	6'-0"
1¼" & 1½"	8'-0"
2" & 3"	10'-0"
4" and larger	14'-0"

20. Maximum spacing of hangers for copper piping shall be as follows:

Pipe Size	Spacing
½", ¾" & 1"	6'-0"
1¼" & 1½"	6'-0"
2" & 3"	10'-0"

21. Whenever possible valves shall be installed with the operating stems in the upright position, however when conditions dictate it is acceptable to position valves 90^{o} to either side of vertical. Valves shall not be installed with the stems in the downward position.

22. Do not substitute one style of valve indicated on drawings for another unless authorized by the Architect. Example: If a gate valve is shown use ONLY a gate valve or if a ball valve is shown use ONLY a ball valve.

23. Mount in-line air separators which include integral strainers independent of the piping system. Do not obstruct removal area of strainer with pipe hangers, equipment or other piping.

B. Joints and Connections

1. Smoothly ream all cut pipe; cut all threads straight and true; apply best quality Teflon tape to all male pipe threads but not to inside of fittings; use graphite on all plugs.

2. Make all joints in copper tube (water and drains) with 95-5 tin-antimony solder applied in strict accordance with the manufacturer's recommendations.

C. Fire Safety

Fire extinguishing equipment shall be kept within 25 feet of welding areas at all times. Contractor shall take additional measures when welding close to wood structures to protect the wood from igniting.

D. Thermometers

1. Install thermometers where indicated on drawings and:

2. Install thermometers on piping at all duct hot water heating coils.

3. Install thermometers on hot water piping at each port of reset water valve.

3.03 PIPING TEST AND ADJUST

A. During the installation, all hot water supply and return piping shall be tested with water to a pressure of not more than 125 psi and held for a period of not less than four (4) hours. Isolate cast iron boilers and any other piping or devices not designed for this pressure. Any leaks shall be repaired and another test applied to the piping. All piping shall be tested before it is insulated or otherwise concealed. Contractor shall be required to certify in writing that piping has been tested and conforms to these requirements.

B. Before operating the fuel oil system, all fuel oil suction line shall be tested with a vacuum of 6 inches of mercury and held for a period of not less than four (4) hours. Any leaks shall be repaired and another test applied to the piping. All piping shall be tested before it is concealed. Contractor shall be required to certify in writing that piping has been tested and conforms to these requirements.

C. Before operating the water system, all of the new piping shall be flushed out to remove oil and foreign materials. This shall be accomplished by circulating a solution of heavy duty detergent by use of Mechanical Contractor supplied pump.

D. After the installation is complete and ready for operation, the system shall be tested under normal operating conditions in the presence of the Architect and demonstrated that the system functions as designed.

E. It shall be demonstrated that all parts of heating system have a free and noiseless circulation of water and that all parts are tight. It shall also be demonstrated that all units are functioning properly and that control system operates correctly.

F. Should any defects in operation develop during the test periods, the Mechanical Contractor will proceed to correct defects immediately. Additional tests will be conducted after correction.

3.04 INSTALLATION OF DUCTWORK AND EQUIPMENT

A. General

1. Size and general arrangements as well as methods of connecting all

diffusers, registers, grilles, duct coils and equipment shall be as indicated, or to meet requirements for complete installation.

2. Construction standards and sheet metal gauges shall be as outlined in the latest edition of the SMACNA HVAC Duct Construction Standards handbook for metal and flexible ducts unless specifically indicated otherwise.

3. Manual Dampers

   a. Manual dampers may be shop-fabricated on units 5 inches in height and less. All dampers larger than 5 inches MUST be pre-fabricated as previously outlined in this specification.
   b. All manual dampers located within 10 feet of a fan outlet shall have the blades oriented perpendicular to the fan shaft.
   c. Provide duct access door as large as possible up to 12 inches x 12 inches at EACH manual damper larger than 5 inches.

B. Protection and Cleaning

1. All open ends of ductwork which is to be unattended for 4 hours or more shall be temporarily protected with plastic sheeting and duct tape (or similar method) to reduce the collection of construction dust and debris.

2. Prior to testing and balancing and at the end of the construction, clean the interiors of all supply and return air ductwork before changing filters in air handling equipment. Careful coordination must be maintained between the time of testing and balancing and final delivery to avoid re-accumulation of dust and debris within the duct systems which will require additional cleaning by the Mechanical Contractor.

3.05 TESTING, ADJUSTING AND BALANCING (TAB)

A. General

1. TAB contractor shall be a subcontractor to the Mechanical Contractor.

2. TAB contractor shall perform functional performance test of all Division 23 00 00 equipment and entire ATC system for specified operation and control sequences.

3. The mechanical contractor shall startup all Division 23 00 00 equipment as required by the equipment specifications. Mechanical contractor shall verify that systems are complete and operable before TAB commencing work. Ensure the following conditions:

   a. Systems are started and operating in a safe and normal condition.
   b. Temperature control systems are installed complete and operable.
   c. Proper thermal overload protection is in place for electrical equipment.
   d. Final filters are clean and in place. If required, install temporary media in addition to final filters.

e. Duct systems are clean of debris.
f. Fans are rotating correctly.
g. Volume dampers are in place and open.
h. Air coil fins are cleaned and combed.
i. Access doors are closed and duct end caps are in place.
j. Air outlets are installed and connected.
k. Duct system leakage is minimized.
l. Hydronic systems are flushed, filled, and vented.
m. Pumps are rotating correctly.

4. TAB Contractor shall submit field reports to General Contractor. Report defects and deficiencies noted during performance of services which prevent system testing and balance.

5. TAB contractor shall submit all verification and functional performance checklists/results, signed by indicated personnel, organized by system and sub-system.

6. TAB contractor shall submit other reports described below.

B. Work Included

1. Test, adjust and balance all air and water systems, including components to conform to air and water flow rates shown on drawings.

2. Test complete automatic temperature control sequences for specified operations described under AUTOMATIC TEMPERATURE CONTROLS.

3. Complete and submit balance report. Report shall be submitted with information noted on one side of sheet only (i.e., backside of sheet shall be blank.).

4. Testing of air and water systems will be done by the same agency.

5. Mechanical Contractor SHALL PROVIDE copies of shop drawings indicating coil gpm's, air handling unit air volumes, etc. to the Testing and Balancing contractor at no cost to the contractor.

6. Careful coordination must be maintained between the time of testing and balancing and final delivery to avoid re-accumulation of dust and debris within the duct systems which will require additional cleaning by the Mechanical Contractor.

C. Quality of Compliance

1. Qualification: TAB Contractor must be independent test and balancing agency.

2. AABC Compliance: Comply with AABC Manual MN-1 "AABC National Standards" as applicable to mechanical and hydronic distribution systems and/or Sheet Metal and Air Conditioning Contractors National Association,

Inc. (SMACNA).

3. Industry Standards: Comply with ASHRAE recommendations for measurements, instruments and testing and balancing.

4. Coordination: Work together with Automatic Temperature Control Contractor to adjust set points of various devices to balance system(s) and test ATC sequences of operation. Temperature Control Contractor shall be responsible for balancing return air, exhaust (relief) air and outdoor air dampers on Air Handling Units in order to achieve proper mixed air temperatures.

5. ASHRAE Guideline 1-1996, "The HVAC Commissioning Process".

D. Execution of TAB Work

1. TAB Contractor shall visit job site and determine that control devices, test devices and valves are correctly installed and ready for balancing.

2. Examine each air and hydronic distribution system to see that it is free from obstructions. Determine that all dampers, registers and valves are in a set or full open position; that moving equipment is lubricated, and that required filters are clean and functioning. Request that Installing Contractor perform any adjustments necessary for proper functioning of the system.

3. TAB Contractor shall use test instruments that have been calibrated within a time period recommended by the manufacturer, and have been checked for accuracy prior to start of testing, adjusting and balancing activity.

4. Verify that all equipment performs as specified. Adjust variable type drives, volume dampers, control dampers, balancing valves and control valves as required by TAB work.

5. Test pressure profile of systems by traverse as required.

6. Adjust each register, diffuser terminal unit and damper to handle and properly distribute design airflow within 5% of specified quantities. Mark all setpoints.

7. Adjust front and rear discharge louvers on each supply register to distribute air in an even pattern or as indicated on plans.

8. Adjust all adjustable balancing valves so that each heating/cooling coil is furnished with design fluid flow within 5% of the specified quantities. Mark all set points.

9. Take readings of all preset balancing valves and log the results.

10. Adjust air discharge patterns of all supply air diffusers, registers and grilles for optimal air diffusion.

11. Document results of all testing on approved TAB report formats and submit 3 copies for approval and record within 15 days of completion of TAB work. Include a warranty period of 90 days, during which time the Architect/Engineer may request a re-check or re-adjustment of any part of the work.

12. Reports shall be compiled on a spreadsheet such as Excel, Quattro-Pro, Lotus, etc. and shall clearly indicate the following *minimum* information:

    a. Air (Rated and Actual)

        1) System/unit name
        2) HP, BHP, voltage, amperage and fan rpm
        3) Static pressures; suction, discharge and total
        4) Total system flow rate
        5) Individual terminal flow rates (Terminal readings must show location, make, model and size of register, grille or diffuser).
        6) Provide a static pressure profile of all AHU's components in the two extreme operating modes; minimum outdoor air and economizer cycle.
        7) Filter status report

    Reports to have a minimum of color or must be compatible with monochrome printers. Reports must be submitted to the Architect electronically in addition to hard copies.

E. Drawings

Drawings in CAD format may be made available to the TAB Contractor after the contract for this work is awarded. Contact the Engineer via telephone or at mechsyst@maine.rr.com and request the drawings, indicating CAD format required and a return e-mail address. See par. 1.10, “ELECTRONIC DRAWINGS AND FILE SHARING” for additional information.

F. Acceptable TAB Contractors (listed alphabetically)

1. Central Air Balance
2. Maine Air Balance
3. Tab-Tech International
4. Tekon-Technical Consultants
5. Yankee Balancing

3.06 CLOSING IN UNINSPECTED WORK

A. General

Do not cover up or enclose work until it has been properly and completely inspected and approved.

B. Noncompliance

Should any work be covered up or enclosed prior to all required inspections and approvals, uncover the work as required. After it has been inspected completely and approved, make all repairs and replacements with materials necessary for approval by the Architect and at no additional cost to the Owner.

3.07 TEMPORARY HEATING

A. Mechanical Contractor shall install the new heating system and related equipment as soon as those portions of the building are ready and the work can be performed.

B. Mechanical Contractor will be required to permanently connect as many units as possible for temporary heat.

C. At the conclusion of the temporary heating period, the complete system shall be thoroughly cleaned.

D. General Contractor will be required to assume full responsibility for the care and operation of the new equipment during its temporary use and to return the equipment to the Mechanical Contractor in perfect order, normal wear and tear excepted.

E. Water, fuel and electric power required to operate the heating system for temporary heat shall be provided by the General Contractor.

3.08 CLEANING

Prior to acceptance of the buildings, thoroughly clean all exposed portions of the Heating, Ventilating and Air Conditioning installation, including the removal all labels and all traces of foreign substance. Prior to testing and balancing vacuum and clean inside of all air handling units, VAV units, fans and cabinet unit heaters. Clean the interiors of ductwork as outlined in 3.04, “INSTALLATION OF DUCTWORK AND EQUIPMENT”; paragraph “B”, “Protection and Cleaning”.

309 INSTRUCTIONS

On completion of the job, the Mechanical Contractor shall provide a competent technician to thoroughly instruct the Owner's Representative in the care and operation of the system. The total period of instruction shall not exceed twenty-four (24) hours. (Temperature control system instruction shall be in addition to this instruction period). The time of instruction shall be arranged with the Owner.

3.10 REMOVAL OF EXISTING PIPING AND EQUIPMENT

A. All piping and equipment indicated on the drawings for removal shall be done so by the Mechanical Contractor.

B. All materials removed shall remain the property of the Owner until such time the Owner has reviewed the removed materials and either taken or designated items which he may wish to retain. The remainder shall become the property of this Mechanical Contractor and be removed from the premises immediately.

C. Any damages done to removed materials prior to release by the Owner shall be corrected by the Mechanical Contractor at no additional expense to the Owner. Any materials removed prior to release by the Owner shall be replaced by the Mechanical Contractor at no additional expense to the Owner.

3.11 RECYCLING

Discarded materials, both new and removed, shall be recycled whenever practical through metal salvage dealers (ductwork, piping, etc.), paper salvage (cardboard shipping containers, etc.), wood & plastic products, etc. The Mechanical Contractor shall retain the salvage value of discarded materials and may use this value to offset his project bid price if so desired. Toxic materials such as adhesives, coolants, refrigerants, etc. SHALL be disposed of in a manner acceptable to the State of Maine Department of Environmental Protection.

3.12 HAZARDOUS MATERIALS

Mercury, asbestos or any other material deemed hazardous by the Federal Environmental Protection Agency or the State of Maine Department of Environmental Protection, shall not be used in any components of the mechanical systems.

END OF SECTION

SECTION 26 00 00 – GENERAL ELECTRICAL CONDITIONS

PART 1 GENERAL

1. The word "Owner" when used in the Electrical Specification shall refer to Neva Cram and Kerry Drach.

2. The word "Architect" when used in the Electrical Specification shall refer to Mills-Whitaker Architects, LLC.

3. The words "Electrical Engineer" when used in the Electrical Specification shall refer to Electrical Design Consultants.

4. The word "provide" when used in the Electrical Specification and Electrical Drawing Notes shall mean to furnish and install.

5. The word "furnish" when used in the Electrical Specification and Electrical Drawing Notes shall mean that the Contractor is to purchase equipment but not install the equipment.

6. The word "install" when used in the Electrical Specification or Electrical Drawing Notes shall mean that the Contractor is to install equipment but not purchase the equipment.

1.01 SCOPE

A. The phrase "Electrical Work" and the "scope of the Electrical Work" shall mean and is intended to include the providing of all labor, material, and equipment to satisfactorily accomplish the installation and tests described or referenced on the Electrical Drawings or in this Electrical Specification.

B. As a minimum, all Electrical Work will be accomplished in accordance with the most recent edition or revision of the National Electrical Code, NFPA-70. No electrical construction requirements for this project, which are also requirements of the National Electrical Code, will be repeated on the project's Electrical Drawings or in the Electrical Specification. There will be no further reference to specific aspects of the National Electrical Code throughout the Electrical Drawings and Electrical Specification except that:

1. All requirements on the Electrical Drawings or in the Electrical Specifications which appear to allow electrical work that is in violation of the National Electrical Code shall be considered to be errors or omissions on the Electrical Drawings or in the Electrical Specification. The Contractor shall include in the bid for this work all costs to complete the work in accordance with the National Electrical Code regardless of these errors or omissions.

2. All requirements on the Electrical Drawings or in the Electrical Specification which are more restrictive than the National Electrical Code and/or are in addition to the minimum requirements of the National Electrical Code are intended to be requirements over and above those of the National Electrical Code and are to be accomplished as described.

3. Utility requirements which are more restrictive than the National Electrical Code and/or more restrictive than the Electrical Drawings and Specifications are

considered to be project requirements in addition to the National Electrical Code and the Electrical Drawings and Specifications.

4. Conflicts between the requirements of the National Electrical Code and requirements of any other applicable building code, utility requirements, or local ordinance shall be resolved in favor of the National Electrical Code unless the conflicting code or requirement specifically states that it is to supersede the National Electrical Code.

5. Discrepancies between the Electrical Engineer's drawings and specifications and the drawings and specifications of the Landscape Architect, the Project Architect, the Civil Engineer, the Structural Engineer, and the Mechanical Engineer shall be resolved by the Electrical Engineer. The Electrical Engineer's resolution shall take the form of a review of the project documents and a determination of details of the Electrical Work to be provided that is most appropriate for the project without regard to the relative construction cost associated with other possible determinations. If construction costs associated with other possible determinations are greater than the construction cost associated with the Electrical Engineer's determination, then a credit will be due from the Contractor to the owner for the difference between the most expensive possible determination and the Electrical Engineer's determination.

C. In addition to the requirements of the General, Special, and Supplementary conditions of the project's other specification sections and contract documents, the Electrical Specification includes the following sections:

26 00 00	General Electrical Conditions
26 02 00	Shop Drawing Submittals
26 03 00	Fire Rated Penetrations
26 05 26	Grounding & Bonding for Electrical Systems
26 05 29	Supporting Devices
26 05 33	Pull Boxes, Enclosures & Wireways
26 09 23	Lighting Controls
26 11 10	Conduit
26 12 00	Conductors, Cables & Connectors
26 13 40	Outlet and Device Boxes
26 14 50	Receptacles
26 14 70	Cover Plates
26 43 00	Metering
26 47 40	Panelboards & Switchboards
26 47 70	Safety Switches & Disconn. Means
26 50 10	Lamps
26 51 00	Interior Building Lighting
26 52 00	Exterior Building Lighting
26 58 00	Emergency Lighting
26 92 10	Misc. Mechanical Equipment
27 20 00	Data Wiring Systems
27 30 00	Voice Wiring System
27 40 00	Cable Television System

SECTION 26 00 00 – GENERAL ELECTRICAL CONDITIONS

28 30 00 Fire Alarm System

1.02 ELECTRICAL SAFETY

A. The Contractor shall enforce industry standard safe electrical practices and procedures including contained in the listed referenced in Paragraph 1.07.

1.03 EXAMINATION OF SITE AND CONTRACTUAL DOCUMENTS

A. Before submitting bid and beginning any work, it is understood and agreed that the Contractor is competent to provide the type of Electrical Work shown on the Electrical Drawings and Specifications and has become aware of all Electrical Work required for the satisfactory completion of this project by careful examination of all the project's drawings and specifications, the work site and related contract documents.

1.04 CONTRACTOR'S WARRANTIES

A. The Contractor warrants that all Electrical Work shall be free from defects.

B. Any defective Electrical Work shall be repaired by the Contractor without cost to the Owner, Architect, or the Electrical Engineer. This repair cost shall include any direct or indirect damages resulting from the failure or the repair of the Electrical Work.

C. The Contractor agrees to indemnify, defend, and hold harmless the Owner, Architect, and the Electrical Engineer from and against all loss or expense (including costs and Attorney's fees) by reason of liability imposed by law upon the Owner, Architect, or the Electrical Engineer for damages because of bodily injury, including death at anytime arising therefrom, sustained by any person or persons or on account of damage to property, including loss of use thereof, arising out of or in consequence of the performance of the contract, provided such injury to persons or damage to property is due or claimed to be due to the negligence of the Contractor, his employees or agents.

D. The Contractor warrants that there has been no collusion with the Electrical Engineer or anyone from the office of the Electrical Engineer.

E. The Contractor warrants that he has not been influenced by any oral statement or promise of the Electrical Engineer, but only by these Contract Documents.

F. The Contractor warrants that he is qualified and authorized to do work in the State of Maine and is familiar with all general and special laws, ordinances, and regulations that may affect the work, its performance, or those persons employed therein.

1.05 CLEAN-UP

A. At the completion of each workday, the area shall be left "broom" clean. At the completion of the project there shall be no Electrical Work debris left at the site.

1.06 DRAWINGS AND SPECIFICATIONS

A. The Drawings and Specifications are complementary each to the other and the work required by

either shall be included in the Contract as if called for by both. All conflicting directions between Drawings and Specifications shall be resolved by requiring the more restrictive direction be followed.

B. All work shown on the Drawings is intended to be approximately correct to the scale of the Drawings, but figured dimensions and detailed Drawings are in all cases to assume precedence over them. Where differences exist between two or more descriptions of work to be accomplished, the more detailed description shall be followed.

C. The Electrical Drawings are diagrammatic and are not intended to show every detail of construction or the exact location of equipment. Where building construction makes it advisable or necessary to change the location of equipment, the Contractor shall perform such work without additional cost to the Owner, Architect, or the Electrical Engineer for the project. Any doubt as to the intended location of equipment shall be resolved by the Electrical Engineer before proceeding with the installation.

D. Details and information not customarily shown on Electrical Drawings or described in Electrical Specifications, which are, however, necessary for the proper installation and operation of the project's systems and equipment or required to meet applicable codes shall be included in the Contractor's price the same as if herein specified and shown.

E. The intent of Drawings and Specifications is to obtain an electrical installation of all systems, complete in every detail and with all electrical systems properly interconnected. The Electrical Contractor shall provide all such parts as may be necessary to complete the systems in accordance with the highest quality of industry standards and to the satisfaction of the Electrical Engineer. Upon completion, the electrical systems and all equipment throughout the project shall operate safely, satisfactorily and function as intended.

F. In any discrepancy between requirements of the Drawings and Specifications, the Electrical Engineer shall resolve the discrepancy.

G. If the Contractor discovers any error or omission in the Drawings or Specifications or in the work undertaken and performed by him, he shall immediately notify the Electrical Engineer and the latter shall promptly investigate the matter and provide instruction for the correction thereof.

H. The locations of existing and proposed underground utilities, if shown, are shown in an approximate way only. The Contractor shall determine the exact locations of all existing underground utilities before commencing work. The Contractor agrees to be fully responsible for any and all damages which might be occasioned by his failure to locate and preserve existing underground utilities exactly.

1.07 CODES, STANDARDS, INSPECTIONS AND FEES

A. All Electrical work shall be in accordance with the most recent edition or revision of the following documents. (Note: See paragraph 1.01B in addition to requirements below.)

1. NFPA 101 (Life Safety Code).

2. NFPA-72 (National Fire Alarm Code)

3. NFPA-70 (National Electrical Code)

4. ANSI C2 (National Electrical Safety Code).

5. Underwriters Laboratory detailed requirements for installation of listed material and equipment published in their documents titled:

   a. Electrical Construction Materials Directory.

   b. General Information for Electrical Construction, Hazardous Location, and Electrical Heating and Air Conditioning Equipment.

   c. Fire Resistance Directory.

   d. Electrical Appliance and Utilization Equipment Directory.

6. OSHA 2079 Vol. III (Construction Industry Standards).

7. OSHA Standards contained in the Code of Federal Regulations # 1926 Subparts S and K.

8. IBC (International Building Code).

9. Local Utility Requirements.

10. Local Building Codes.

B. In case of differences between any of the requirements in paragraph A above, as applied to this project, the most restrictive shall govern.

C. Where Drawings and Specifications indicate work in addition to the above requirements, the Drawings and Specifications shall be followed.

D. All Utility (power, telephone, data, fire alarm and CATV) installation and connection fees and fees for permits and inspections shall be included in the Contractor's bid.

E. The Contractor shall include in his bid all costs to bring utilities into the project that are not paid for by the utility. This includes but is not limited to such utility charges as transformer installation costs, "excess costs" for underground service, new pole locations, and easements.

F. The Contractor shall include in his Bid all work associated with assisting telephone system installer.

G. The Contractor shall be responsible for the timely notification of the Authority Having Jurisdiction in order that required inspections of Electrical Work may be accomplished.

H. The Contractor shall submit a letter to the Electrical Engineer stating that the Electrical Work has satisfactorily passed inspection by the Authority Having Jurisdiction.

1.08 DIMENSIONS AND COORDINATION

A. The Contractor is responsible to verify field dimensions and coordinate Electrical Work with that of other trades.

1.09 NOT USED

1.10 MATERIALS AND EQUIPMENT

A. All materials and equipment provided as part of this project shall be new, undamaged and shall be "listed and labeled" for the use herein intended as defined in the National Electrical Code.

B. Samples of materials and equipment shall be submitted to the Electrical Engineer for his review if requested.

1.12 MATERIAL SAFETY DATA SHEET (MSDS)

A. The Contractor shall request the U.S. Department of Labor (OSHA) Material Safety Data Sheet (MSDS) for every component of electrical material provided as part of this project. All MSDS for the project shall be assembled alphabetically in a 3-ring binder and given to the Electrical Engineer prior to substantial completion.

B. The Contractor shall provide a letter to the Electrical Engineer stating that all the MSDS available for equipment and material used on this Project are included in the 3-ring binder.

1.13 AS-BUILT RECORD DRAWINGS

A. The Contractor shall keep on the job at all times, one complete set of Drawings and Specifications of the Electrical Work, on which shall be neatly and accurately noted any of the project's Electrical Work that is provided other than as shown on the Drawings or described in the Specifications. Such deviations from the Drawings and Specifications shall be noted with explanation.

B. At the conclusion of the Project, the Contractor shall prepare Record Drawings based upon as-built conditions. Every deviation from the Project's Drawings and Specifications shall be detailed. These Record Drawings shall be of the same quality as the original Project drawings.

C. Provide the tie point dimensions from building structural features to the ground rod locations.

D. Show as-built location of all underground electrical conduits on both the Electrical Site drawings and the project’s Civil Engineering drawing.

E. As-built record drawings shall be submitted to the Electrical Engineer prior to the Electrical Engineer's final "punch list" review of the project.

F. If accurate record drawings are not provided by the Contractor at the time of substantial completion, the record drawings shall be prepared by the Electrical Engineer and the cost to the Electrical Engineer to prepare these record drawings shall be paid out of the contractor's retainer.

1.14 EQUIPMENT IDENTIFICATION

A. Provide black and white laminated plastic name plates attached with epoxy cement having 1/4 inch tall engraved letters identifying each piece of equipment listed below:

1. Disconnect Switches.

2. Circuit breaker panelboards.

1.15 MAINTENANCE INFORMATION

A. The Contractor shall furnish all necessary assistance and instruction to properly train the Owner's authorized personnel in the operation and care of the electrical systems.

B. The Contractor shall furnish a complete set of electrical shop drawings and operating and maintenance manuals for all electrical equipment to the Owner.

C. The Contractor shall submit name, address and telephone number of the Manufacturer's representative and service company for each piece of electrical equipment for service and spare parts.

1.16 DEPARTURE FROM ELECTRICAL DRAWINGS AND SPECIFICATIONS

A. No departure from the Electrical Drawings or these Specifications will be allowed without written request and a copy of the revised electrical drawing from the Contractor. A written request for departure from the Electrical Drawings and Specifications shall include all changes in project cost and effect on project completion schedule associated with the request. All decisions will be in writing from the office of the Electrical Engineer within five days after receipt of the written request for departure from the Contractor.

B. Any departure from the Electrical Drawings or from these Specifications which does not have the written approval of the Electrical Engineer may, at the discretion of the Electrical Engineer, have to be reworked at the expense of the Contractor.

C. No payments for work and material in addition to that included in the scope of the Electrical Drawings or these Specifications, "extras", will be allowed unless the additional work and material is approved in writing by the Electrical Engineer and the cost to the Owner for this "extra" is included in the approval. The amount of the "extra" shall not exceed an estimate based upon the current edition of Means Electrical Cost Data.

D. Departures from the Electrical Plans and Specifications which result in the Contractor not having to perform work or provide material which was included in the scope of these documents shall be accompanied by a reduction in payments, "credits", for the Owner. The value of the work not performed and/or the material not provided, "credit", shall be based upon the current edition of Means Electrical Cost Data.

E. The Contractor shall be responsible to have the Authorities Having Jurisdiction (Electrical Inspector, Fire Prevention Officer, Fire Marshal, etc) review and approve the proposed deviation from the Electrical Drawing and Specifications originally submitted for construction permits. Additional permit fees shall be paid by the Contractor.

F. The Contractor shall be responsible to update bonding and construction insurance policies to account for the changed conditions associated with the deviation from the original Electrical Drawings and Specifications.

SECTION 26 00 00 – GENERAL ELECTRICAL CONDITIONS

1.17 SUBSTANTIAL COMPLETION

A. Before a certificate of substantial completion, or its equivalent, is issued for work herein described, the Contractor shall submit a written statement to the Electrical Engineer stating that all Electrical Work and performance tests have been satisfactorily accomplished in accordance with the Drawings and Specifications.

END OF SECTION 26 00 00

SECTION 26 02 00 – SHOP DRAWING SUBMITTALS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Proposed Equipment and Material submittals.

PART 2 SUBSTITUTIONS

A. No substitution of material or equipment for that specified on the electrical drawings or in the specifications shall be allowed unless otherwise noted on the electrical drawings or this specification.

B. The Contractor shall assume all responsibility for additional expenses resulting from every substitution. For additional details regarding departures from the Electrical Drawings and Specifications, see Section 26 00 00.

D. The Electrical Engineer reserves the right to change from the original specification to another specified material equipment or method if the originally specified material's character has been changed by the manufacturer without notice of change to the Electrical Engineer or applicable laws contradict the intent of this specification.

PART 3 SUBMITTALS

A. Shop drawings shall be submitted as required by the Electrical Project Specifications.

B. Where indicated the Electrical Project Specifications that a submittal is required, the submittal procedure shall be as follows:

1. The Contractor shall provide five sets of submittals.

2. When proposed for review, submittals must bear a Contractor's stamp indicating that the submittal meets the requirements of the Project's drawings and specifications before being proposed for the Electrical Engineer's review. Without the Contractor's stamp, the submittals will be returned for correction.

3. No consideration will be given to brochure or catalog information not specifically marked for and referenced to the Project's drawings or specifications.

4. The submittal shall contain high-lighted or arrowed reference to specified manufacturers' catalog numbers which shall be qualified in writing if required to meet the product performance or characteristics described in the Project's drawings or specifications.

5. In the event that any specified manufacturer's part number has been superseded by a new number since the preparation of the Project's drawings and specifications, the new number shall be provided with the old catalog number noted on the submittal.

6. In any case where a written description or notes on the Project's drawings or specifications pertain to performance or the characteristics of equipment or

hardware and these descriptions or notes conflict with the manufacturer's catalog number, the written description or notes on the Project's drawings or specifications shall take precedence. If the manufacturer is unable to modify the product, as described by the catalog number, to include the written description on the Project's drawings or specifications, then the product described by catalog number shall be considered unsatisfactory for use on this project.

7. All equipment and material submittals shall have a letter included with the submittal that lists the delivery lead time requirements for each item in the submittal. The delivery lead time is the number of CALENDAR days between the time the order for an item is placed with the distributor and the time the item can be delivered to the work site. No proposed item will be reviewed without its delivery lead time indicated.

8. Equipment and material proposals shall indicate all UL listings related to this project's intended application.

9. Equipment and material proposals shall include the Material Safety Data Sheet (MSDS).

10. The contractor shall submit a letter from the "disposal firm" that will accept the demolition materials from this project. For non-hazardous waste, the "disposal firm" shall be the next custodian of the demolition material even if this custodian is only a transportation firm. For hazardous waste, the "disposal firm" will include the transportation firm and final recipient of the hazardous waste. The letter required by this section will state that the firm in custody of demolition material is duly qualified. See Section 26 04 00.

PART 4 EXECUTION

A. No equipment or material associated with a required shop drawing shall be purchased or installed prior to written approval of that shop drawing from the project Electrical Engineer.

B. All submittals for this Project shall be assembled in 3-ring binders.

C. Provide copies of hazardous waste disposal custody certificates to the owner and the Electrical Engineer.

END OF SECTION 26 02 00

SECTION 26 03 00 – FIRE RATED PENETRATIONS

1.01 WORK INCLUDED

A. Sealing electrical penetrations of fire rated walls, floors, and ceilings.

B. Preserving ceiling fire ratings at recessed light fixtures.

1.02 RELATED WORK

A. Conduits.

B. Cables.

C. Boxes.

D. Wireways.

E. Lighting.

1.03 REFERENCES

(Electrical work shall be in accordance with the most recent edition or revision of the following documents.)

A. UL publication: "Electrical Construction Materials Directory".

B. UL publication: "Electrical Appliance and Utilization Equipment Directory".

C. UL publication: "General Information for Electrical Construction, Hazardous Location, and Electric Heating and Air Conditioning Equipment".

D. UL publication: "Building Materials Directory".

E. UL publication: "Fire Resistance Directory".

F. NFPA 101: Life Safety Code.

PART 2 MATERIAL

2.01 ACCEPTABLE MANUFACTURERS (For UL Listed Fire Rated Sealing Material Only)

A. 3M Company: "Fire Barrier" caulking, putty, and systems.

B. Dow Corning: "RTV Silicone Foam" sealants.

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall be responsible to determine the fire rating of every wall, ceiling and

floor penetrated in the course of the project's Electrical Work.

B. The Contractor shall be responsible to preserve the fire rating of every wall, ceiling and floor with regard to penetrations associated with the project's Electrical Work.

3.02 INSTALLATION

A. All cables penetrating floors, ceilings or walls shall be provided in accordance with the UL listed fabrication details furnished by the manufacturer of the fire sealing material to maintain the fire rating.

B. Alternate fire stopping methods are acceptable if they are in accordance with a method shown in the UL Fire Resistance Directory and UL Building Materials Directory.

3.03 DEMOLITION

A. All existing penetrations affected by demolition of existing electrical system components shall be made to meet the requirements for new penetrations.

END OF SECTION 26 03 00

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Power System Grounding.

B. Telephone System Grounding.

C. Data System Grounding.

D. CATV System Grounding.

1.02 RELATED WORK

A. Section 26 11 10 - Conduit.

B. Section 26 12 00 - Conductors, Cables, and Connectors.

C. Testing: See Section 26 08 00.

D. Fire Rated Penetrations: See Section 26 03 00.

1.03 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 GROUNDING RODS

A. Provide copper, clad steel grounding rods.

2.02 GROUNDING ELECTRODE CONDUCTOR

A. Connect slab reinforcing mesh and foundation rebar to grounding electrode conductor at three points.

B. Connect Building's structural steel to grounding electrode conductor.

C. Provide at least two grounding electrodes at least ten feet apart, exterior to the building at more than 5’ from the building foundation.. Provide as many more than two as needed to achieve a 10 Ohm ground resistance. Test ground rod resistance prior to covering with soil and prior to connection to the building power distribution system grounding electrode conductor.

D. Bond and ground domestic water.

PART 3 EXECUTION

3.01 POWER SYSTEM GROUNDING

A. Circuit Grounding: Provide grounding bushings, studs, jumpers, and bonding conductors as required at service entrance, panelboards, and distribution system Users' equipment.

B. Provide as many ground rods as necessary to achieve a safe and adequate system ground. See paragraph 2.02 C. above.

C. Ground rods shall be tested prior to connection to the building power distribution system grounding electrode conductor.

3.02 COMMUNICATION SYSTEM GROUND

A. Telephone: Provide one AWG #2 with green THWN insulation from ground bus at telephone service entrance to the electrical system grounding electrode.

3.03 GROUNDING CONDUCTOR

A. All metallic conduit shall be grounded but shall not be used as the grounding conductor.

B. A separate green insulated grounding conductor shall be provided for every feeder, sub-feeder and branch circuit in conduit.

C. Multi-wire branch circuits will not be allowed on this project.

3.02 TIE POINTS

A. Measure exact location of ground rods and tie to easily recognized building structural feature. Add these measurements and the location of the ground rods to the as-build drawings.

END OF SECTION 26 05 26

SECTION 26 05 29 – SUPPORTING DEVICES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Conduit Supports.

B. Cable Supports.

C. Pull, Outlet, and Junction Box Supports.

D. Luminaries Supports.

1.02 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

2.01 CONDUIT SUPPORTS

A. Single runs may be supported by beam clamps or ring bolt type hangers with specialty clips. Do not use Plumber's perforated strap.

B. Horizontal and vertical conduit shall be supported with specifically designed conduit fittings, framing channel, or beam clamps.

C. Mount conduit as shown in drawing details when given.

2.02 ANCHOR METHODS

A. Hollow Masonry: Toggle Bolts or Spider Expansion Anchors.

B. Solid Masonry: Lead Expansion Anchors or Preset Inserts.

C. Metal Surfaces: Machine Screws, Bolts, Clamps made for the specific application or Welded Studs.

D. Wood Surfaces: Wood Screws and Cable/Conduit Clamps.

E. Concrete Surfaces: Self Drilling Anchors or Powder- Driven Studs.

NOTE: Welding to building steel shall be done only after review of intended weld location with Structural Engineer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Layout to maintain neat mechanical appearance.

SECTION 26 05 29 – SUPPORTING DEVICES

B. Provide supports adequate to carry five times the equipment loads expected.

C. Follow drawn layouts, when shown, as closely as possible avoiding structural features and equipment of other trades.

D. Luminaries shall be supported from building structural members.

E. No conduits shall be supported by pendant wires. All conduit shall be attached directly to the building's structure (except flexible metal conduit), or supported by threaded rod assemblies.

END OF SECTION 26 05 29

SECTION 26 05 33 – PULL BOXES, ENCLOSURES AND WIREWAYS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Pullboxes.

B. Junction Boxes.

C. Electrical Enclosures

D. Electrical Wireways

1.02 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pullboxes and Junction Boxes:

1. Shall be of metal construction.

2. Shall have screw on or hinged cover unless otherwise noted on Electrical Drawings.

3. Waterproof boxes shall have bolted or hinged, and gasketed covers.

4. Exterior Boxes that are exposed to the weather may be non-metallic.

B. Cabinets: Metal construction prime coated and equipped with door, flush hinges, latch and lock assembly.

C. Backboard: All electrical enclosures and wireway shall be mounted on ¾ inch plywood, sized to leave a minimum of 12 inch clear all around. Provide matte gray painted finish on both sides.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pullboxes, junction boxes, enclosures and wireways exposed to the weather or in damp locations shall be weatherproof and have neoprene or silicon rubber gaskets. Silicon rubber gaskets shall be used with heat producing equipment.

B. All boxes, enclosures, and wireways connectors and wire and cable clamping connectors shall be made of metal. No "push-in" plastic cable clamps are allowed.

C. All enclosures exposed to the weather shall have a weep-hole at the lowest point to prevent

the build up of condensation. This does not apply to explosion proof equipment.

D. Where boxes are not sized on the Electrical Drawings, it shall be the Electrical Contractor's responsibility to provide a box sized in accordance with the associated wiring.

END OF SECTION 26 05 33

SECTION 26 08 00 – TEST AND COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Testing of project's systems and components.

B. Test result documentation.

C. A satisfactory operational test of all electrical systems both individually and interconnected with associated systems is required to prove satisfactory installation before final acceptance by the Electrical Engineer. The Contractor shall address a letter to the Electrical Engineer which states that all operational tests were completed and electrical systems functioned satisfactorily.

D. The right is reserved by the Electrical Engineer to inspect and test any portion of the equipment or material during the progress of construction.

E. No electrical work shall be concealed by back filling earth, sheet rocking walls, or any other means until the Electrical Engineer has had the opportunity to inspect the electrical work about to be concealed. The Electrical Engineer shall be given a three day notification of impending concealment.

1.02 RELATED WORK

1.03 REFERENCES

PART 2 EQUIPMENT

2.01 TESTING

A. The Contractor shall provide all necessary instruments and equipment and make all tests, adjustments and trial operations required.

PART 3 EXECUTION

3.01 CONDUCTOR AND BRANCH CIRCUIT TESTS

A. Verify with a continuity tester that phase conductors are not grounded prior to energizing the circuit for the first time.

D. Verify that no current flows in grounding conductors when branch circuits are energized for the first time.

3.02 RECEPTACLE TESTS

A. Every 125 Volt duplex type receptacle shall be tested with a receptacle wiring tester that detects errors of polarity and grounding.

B. Every 125 Volt duplex type receptacle shall be tested to detect high resistance connections,

excessive (over %5) full load voltage drop from service entrance to receptacle, and inadequate plug cap blade retention.

C. Ground fault circuit interrupter type receptacles shall be tested to assure that the trip level is not in excess of .005 Amperes.

D. Verify that the rejection feature of child-resistant receptacles functions properly.

3.03 FLUSH WALL PLATE TEST

A. Cover plates for flush mounted light switches and receptacles shall be firmly mounted against the wall, ceiling or floor surface on all edges and corners. Using a piece of paper as a go no-go gauge, if the paper can be slid behind the cover plate at the corners, the installation is unacceptable and shall be repaired.

B. Wet location wall plate gaskets shall be inspected for proper seal.

3.04 GROUNDING

A. The adequacy of the service entrance grounding system shall be tested by measuring the ground resistance with an earth test megger as described in the National Electrical Code Handbook. The ground resistance shall not exceed 10 Ohms. Provide additional ground rods and conductors as needed.

B. The ground rod(s) shall be tested before being covered with soil.

B. Ground rods shall be tested prior to their connection to the grounding electrode conductor from the building's power distribution system.

C. Record the weather condition and the soil moisture at the time of the ground rod testing.

D. Provide tie points from an easily recognizable building structural feature to the ground rods and show the tie points on the as-built drawings.

3.05 EMERGENCY LIGHTING SYSTEM

A. The emergency lighting system and exit signs shall be operated in the emergency mode for 90 minutes.

B. At the end of the 90 minute test period, the Contractor shall measure the output voltage of battery operated systems at the battery. The battery voltage shall not be less than 87-1/2% of the starting voltage.

C. The Contractor shall measure the foot candle level that the emergency light heads produce at the floor or stair so as to provide not less than the required illumination level over the means of egress in accordance with the Electrical Specification.

3.06 FIRE ALARM SYSTEM

SECTION 26 08 00 – TEST AND COMMISSIONING REQUIREMENTS

A. The Contractor shall include in his bid all costs to have the fire alarm system manufacturer's representative make a thorough inspection and operational test of the complete fire alarm system including all system components. The inspection shall be designed to ensure the following criteria have been met:

1. The complete system and the system's individual components shall be tested in accordance with Chapter 7 of the National Fire Alarm Code. The complete system and the system's individual components shall be proven to operate in accordance with the Project's drawings and specifications, the manufacturer's rated characteristics, and the National Fire Alarm Code;

2. Verify that all installation requirements associated with the UL listing for each component have been adhered to;

3. Verify that the system and its individual components have been provided in accordance with the manufacturer's requirements; and

4. Verify that the required supervisory features of the system function satisfactorily.

3.07 CATV ANTENNA SYSTEM

A. The Contractor shall verify that the CATV system was provided in accordance with the Electrical Drawings and Specifications and manufacturer's detailed installation requirements.

B. The Contactor shall test the installed system to verify that it produces intelligible voice messages where intended.

3.08 LIGHTING SYSTEMS

A. The Contractor shall verify that the lighting system was provided in accordance with the Electrical Drawings and Specifications and manufacturer's detailed installation requirements.

B. The Contractor shall test the installed system provide the intended foot candle levels on the intended surfaces.

C. The Contractor shall test the lighting control systems, daylight harvesting and occupancy sensors.

3.09 VOICE/DATA

A. Installed wiring and connectors shall be tested to demonstrate that the installation meets the minimum performance standards of ANSI/EIA/TIA-569.

B. The Contractor shall verify that the voice/data wiring system was provided in accordance with the Electrical Drawings and Specifications and manufacturer's detailed installation requirements.

3.10 REWORK

SECTION 26 08 00 – TEST AND COMMISSIONING REQUIREMENTS

A. All project systems and system components shall be reworked until test results indicate that the specified criteria have been met and the system functions as intended.

3.11 DOCUMENTATION

A. The Contractor shall address a letter to the Electrical Engineer which states that all specified tests have been accomplished, lists the test results, and states that all systems and components meet the specified criteria.

B. After satisfactory completion of the fire alarm system tests specified above, a Fire Alarm System Record of Completion shall be completed in accordance with the National Fire Alarm Code and sent to the Electrical Engineer. System documentation shall be provided to the Electrical Engineer by the Contractor.

END OF SECTION 26 08 00

SECTION 26 09 23 – LIGHTING CONTROLS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Manual Wall Switch Light Controls

B. Manually operated wall mounted Incandescent Dimmers.

C. Manually operated Fluorescent Dimmers.

D. Dimming Ballasts.

1.02 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURES

A. Lutron.

B. Leviton.

C. General Electric (not push on-off type)

D. Fluorescent dimmers shall be by manufacturers specified or described on the electrical drawings.

2.02 MATERIALS

A. Manual, toggle operated, light switches.

1. Shall be rated 20 Amperes.

2. Provide matching single pole, two pole, 3 way and 4 way switches as indicated on the project's electrical drawings..

3. Switches shall be rated 120/277 VAC.

4. Toggle color shall be gray.

D. Dimmers (Manual/Automatic/Incandescent/Fluorescent)

1. Manual dimmers shall be solid state, semi-conductor type capable of controlling lighting intensity over the complete range from off to full brightness with integral On/Off switch.

2. Suitable for mounting in multi-gang outlet box without de-rating.

3. Rated a 1000 Watts unless noted on the drawing.

4. Shall have radio, television, voice and computer interference filter.

5. Shall operate with 3-way switches where shown on drawing.

6. Dimmer shall be line voltage compensated to prevent flicker.

7. Fluorescent dimmers shall be capable of dimming fluorescent lamps from full rated lumen output to zero lumen output.

8. Electronic ballasts shall be those approved by the dimmer manufacturer to provide satisfactory operation (full rated lamp lumens to zero lamp lumens) using this dimmer.

9. Dimmer control shall turn “off” all power to the luminaire at the extreme end of the manual adjustment.

PART 3 EXECUTION

3.01 INSTALLATION

A. Mount top of manual, wall mounted light switch outlet box 48" AFF unless otherwise noted on Drawing.

A. Coordinate mounting location with Architectural details.

C. Manual wall mounted light switches by doorways shall be mounted on the latch side of the door openings. Verify door swings with Architectural Plans.

D. Light switches by doorways shall be mounted at least 4" away from door frame.

E. When more than one light switch (multi-gang) is provided by a door, the lights closest to the door shall be controlled by the light switch closest to the door opening.

F. Mount at switch height, or as shown or noted on the electrical drawings and the manufacturer's installation details.

G. The dimmer control, the dimming ballast, and the dimming system ballast controller components shall be installed jointly in accordance with the dimming system manufacturer and the luminaire manufacturer.

END OF SECTION 26 09 23

SECTION 26 11 10 – CONDUIT

PART 1 GENERAL

1.01 WORK INCLUDED

A. Rigid Metal Conduit and Fittings.

B. Electrical Metallic Tubing and Fittings.

C. Flexible Metal Conduit and Fittings.

D. Liquidtight Flexible Metal Conduit and Fittings.

E. Rigid Non-Metallic Conduit and Fittings.

F. Surface Mounted Metallic Wiremold.

1.02 SUBMITTALS

A. Provide shop drawing submittals...

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 ELECTROLYSIS

A. Do not bring dissimilar metals into contact with each other to prevent electrolysis. Where dissimilar metal contacts cannot be avoided, coat surfaces with corrosion inhibiting compound before assembling.

3.02 CONDUIT SIZING, ARRANGEMENT, AND SUPPORT

A. Size conduit for Type THW insulated conductors, unless conduit size is otherwise specified on the Drawings.

B. Arrange conduit to maintain headroom and present a neat appearance.

C. Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.

D. Maintain minimum six inch clearance between conduit and heat sources.

E. Arrange conduit supports to prevent distortion of alignment by wire pulling operations.

F. Group conduit in parallel runs using conduit racks constructed of steel framing channel, threaded rods, and conduit straps or clamps. Provide space for 25 percent additional conduit.

3.03 CONDUIT INSTALLATION

SECTION 26 11 10 – CONDUIT

A. Do not construct moisture traps in conduit runs. All conduit shall slope to drainage points.

B. Use suitable conduit caps to protect empty conduit against entrance of dirt and moisture.

C. Provide pull cord with length indications in every empty conduit.

D. Provide expansion fittings complete with grounding jumpers where conduits cross building expansion joints, where metal conduit straight run exceeds 200 feet, and where PVC conduit straight run exceeds 100 feet. Expansion couplings in metallic conduit shall have copper bonding conductors.

E. Make connections to motors and vibrating equipment with a minimum of 24 inches of flexible conduit. Minimum size 1/2 inch for motor connections. Use 3/8 inch flexible conduit only for fixture and control wiring.

F. All penetrations of building's exterior envelope shall be made weatherproof.

G. All metal conduit shall be grounded but shall not be used as the grounding conductor.

3.04 CONDUIT INSTALLATION SCHEDULE

A. Exposed Outdoor Locations shall be Threaded Rigid Metal Conduit, (RMC).

B. Exposed Interior Locations shall be Electrical Metallic Tubing unless otherwise noted on the Electrical Drawings or in more detailed parts of the Specification.

C. Surface mounted raceways such as Walkermold and Wiremold shall be used only where detailed on the drawings.

3.05 CONDUIT COLOR CODE

A. Coat metallic conduits, prior to installation, with chip resistant enamel paint or 1/2" wide self-sticking marker tape at 3' intervals using the following color code:

1. Red: Conduits containing fire alarm system conductors.

2. Natural (no paint):
Conduits containing 120/240 volt circuits except those on generator power.

3.06 PULLTAPES

A. Provide pull cord that has length indications in all empty conduits. Provide tags on each end of all pull cords giving location of other end.

3.07 Show as-built location of all electrical conduits installed underground outside the building and below the slab inside the building. The underground conduits outside the building shall be shown on both

the Electrical Site drawing and the Civil Engineering site drawing. The conduits provided under the slab, inside the building, shall be shown on the Electrical Power Distribution Drawing.

END OF SECTION 26 11 10

SECTION 26 12 00 – CONDUCTORS, CABLES, AND CONNECTORS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Conductors and Cables.

B. Connector Hardware.

1.02 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

2.01 MATERIALS

A. Conductor material (COPPER): Electrical conductors shall be copper. Individual conductor insulation shall be type THWN, 600 Volts, and shall be UL listed and labeled for the use herein intended. Note: Conduits shall be sized based on THW insulation.

B. Conductor material (ALUMINUM): NO ALUMINUM CONDUCTORS SHALL BE ALLOWED IN ANY APPLICATION ON THIS PROJECT, UNLESS SPECIFICALLY IDENTIFIED ON ELECTRICAL DRAWINGS.

C. Individual branch circuit conductors shall not be smaller than AWG #12. Conductors shall have insulation rated at 600 Volts. The ampacity shall be sized at 60 degrees Centigrade for conductors AWG #12 through AWG #1.

D. Conductors inside luminaires shall not be smaller than AWG #12 with heat resistant thermoplastic rated for 600 VAC and with a minimum operating temperature rating of 90 degrees Centigrade.

E. Conductors sized AWG #10 and smaller shall be connected by either color coded twist-on spring loaded or color coded die compression type connectors.

F. Conductors sized AWG #8 and larger shall be connected by either color coded die compression or bolted connectors.

G. Connectors which pierce insulation as means of making contact with conductor SHALL NOT BE ALLOWED on conductors sized AWG #10 or smaller.

H. Connectors which pierce insulation as means of making contact with conductor shall have the contact pressure maintained by steel nut and bolt.

I. Exterior exposed wiring shall be in threaded rigid metallic conduit. Where the conduit is exposed to direct sun, the conductor insulation shall be type THHN.

J. Individual THWN insulated conductors ampacity shall be sized at 60 degrees Centigrade through AWG #1 and at 75 degrees Centigrade where larger than AWG #1.

K. All conductors and cables used on this project shall have an overall insulation rating of at least 600 VAC.

L. Type MC cable shall be used for size AWG #10 & 12 branch circuits except where flexible metal conduit is specified.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide only copper grounding electrode conductors, and straps.

B. Identify circuits in panelboards and load centers with permanent tags attached to conductors as they leave breaker or fuse lugs. This requirement is in addition to panel directory requirements.

C. Color code conductors insulation to designate grounding conductor, neutral conductor and phase conductors as follows:

120/240	Phase - A	Black
	Phase - B	Red
	Neutral	White
	Ground	Green

END OF SECTION 26 12 00

SECTION 26 13 40 – OUTLET AND DEVICE BOXES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Outlet and Device Boxes.

1.03 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

2.01 MATERIALS

A. Boxes.

1. For use in all interior walls in dry locations, outlet and device boxes shall be plastic with adjustment means that allows setting box depth from finished wall or ceiling surface after electrical rough-in wiring and after wall construction is completed but before final box cover or wall plate is installed.

2. For use on interior sides of all exterior walls in dry locations, boxes shall have thermal insulation installed between the back of the box and the exterior sheathing.

3. Boxes to be installed in vapor barrier type walls and ceilings shall be rated for preserving the vapor barrier.

PART 3 EXECUTION

3.01 INSTALLATION

A. Where interior boxes are mounted in exterior walls the Electrical Contractor shall provide insulation behind outlet boxes to prevent condensation in boxes.

B. In all junction boxes exposed to NEMA-3R, weather, drill 1/8 inch diameter drain hole into box cavity at lowest point. This does not apply to explosion proof boxes.

C. Wall plates for flush outlet boxes shall be against the wall on all edges and corners.

D. Where outlet boxes are installed by doors, windows, or any other wall opening, the outlet box shall be mounted at least four inches away from the frame and any molding around the opening.

E. Where enclosures are not sized on the Electrical Drawings, it shall be the Electrical Contractor's responsibility to provide a box sized in accordance with associated wiring.

F. Do not mount recessed boxes back to back in any partition, wall, floor or ceiling.

SECTION 26 13 40 – OUTLET AND DEVICE BOXES

G. Do not mount recessed boxes back to back in same stud or framing bay in walls unless the installation is in accordance with the UL listing for the box and the UL design for the wall..

H. Verify that UL listing requirements are followed for installation of outlet and device boxes in fire rated walls and ceilings.

END OF SECTION 26 13 40

SECTION 26 14 50 – RECEPTACLES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Electrical Power Outlet.

1.02 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 ACCEPTABLE MANUFACTURERS

A. Receptacles shall be by Manufacturers specified on Drawings, where indicated.

2.02 DEVICES

A. Standard Duplex Receptacles: (Not Childproof)

1. Shall be rated 20 Amp, 125 VAC, 2 pole, 3 wire.

2. Shall be polarized, straight blade, with U grounding slot and of NEMA 5-20 configuration.

3. Shall be full gang size.

4. Color shall be gray.

5. Wiring terminals:

a. Receptacles shall be provided side-wired with screw terminals which when wired must have two full threads of engagement on extruded section in terminal.

B. Ground Fault Circuit Interrupter Receptacles:

1. Shall be rated 20 Amp, 125 VAC.

2. Color shall be gray.

3. Maximum Earth Leakage Current needed to trip shall be .005 Amperes.

4. Use feed through GFCI ONLY where specifically called for on Electrical Drawings.

5. Shall have a built-in test circuit.

6. Where exposed to weather receptacle shall have a waterproof spring loaded cover for exterior mounting. Wet location receptacles shall be waterproof with attachment plug inserted.

7. GFCI receptacle shall have an indicator light which shows that the receptacle is energized.

C. Clothes Dryer Outlet shall be 30 Ampere, 125/250 Volt grounding type unless otherwise noted on Drawing.

PART 3 EXECUTION

3.01 INSTALLATION

A. Mount receptacles vertically with bottom of box at 18 inches AFF with grounding pole at top unless otherwise noted on Drawing.

B. In all areas, coordinate receptacle height with benches and counters. Verify equipment and counter layout and details with other trades. Receptacles shall be mounted eight inches above counters and benches unless otherwise noted on Drawings.

C. Provide electrically continuous grounding CONDUCTOR for all receptacles. All conduits shall be grounded but shall not be used as grounding conductor.

E. Receptacles mounted within six feet of every sink or other wet location shall be GFCI type.

F. Every duplex receptacle shown connected to a switch is intended to mean that the top half of the receptacle is switched and is separated from the bottom half. The bottom half is "on" all the time.

G. Before mounting receptacles, the Electrical Contractor shall verify with other trades that the receptacles provided for specific plug connected equipment matches the plug when the equipment is referenced on the Electrical Drawings.

END OF SECTION 26 14 50

SECTION 26 14 70 – COVER PLATES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Cover Plates (Standard and Wet Location rated)

1.02 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 MATERIALS

A. Bakelite, Nylon or PVC: Completely smooth, color to match device for all interior flush mounted receptacles and switches.

B. Cast Metal: Die cast aluminum furnished with four mounting screws and gasket for exterior receptacles and switches.

C. Gaskets: Silicon Rubber for use with Exterior and wet interior outlet boxes.

D. Steel: Hot dip galvanized or cadmium plated.

E. All exterior receptacle and switch boxes shall be fitted with corrosion resistant, watertight, weatherproof, self closing cover plates.

F. Wet location receptacles shall be watertight and weatherproof both when the plug cap is in use and when the plug cap is not in use.

G. Brushed Stainless Steel wall plates shall be used on all flush boxes in finished walls.

2.02 PLATES

A. Flush mounted plates shall be beveled type with smooth rolled outer edge.

B. Surface mounted box cover plates shall be beveled, pressure formed with smooth edge to fit box. Break all sharp edges with file.

C. Waterproof covers shall be gasketed, cast metal for exterior use and PVC or Nylon for interior use with spring-loaded gasketed doors to cover receptacles or switch toggle.

D. Where two-gang boxes are required for single-gang devices, provide special plates with device opening in center of plate. Do not use two gang plates with one opening blanked.

SECTION 26 14 70 – COVER PLATES

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide cover plates on all device, outlet, and junction boxes.

B. Inspect each damp or wet location cover plate installation to insure that the gasket is properly sealing the enclosure.

C. All cover plates on flush mounted boxes shall be firmly mounted against and touch the wall, ceiling or floor surface on all edges and corners. If a piece of paper can be slid behind the cover plate at any point, that installation is unacceptable and shall be repaired.

D. All cover plates shall be parallel and perpendicular to major building lines.

END OF SECTION 26 14 70

SECTION 26 43 00 – METERING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide Metal Housing, Meter Socket, and Service Enclosure for Meter.

B. Provide all equipment, connectors, and conductors not furnished and installed by the local electric power utility.

1.02 RELATED WORK

A. Panelboard.

B. Electric Service.

C. Service Entrance.

D. Grounding.

E. Conduit.

1.03 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide metering enclosures and associated conduits and wiring.

B. All metering equipment and enclosures not furnished and installed by local electric power utility shall be provided by the Electrical Contractor.

C. If required and where allowed the current transformers shall be mounted at the pad mounted transformer, then the meter shall be mounted on a pedestal beside the pad mounted transformer.

END OF SECTION 26 43 00

SECTION 26 47 40 – PANELBOARDS AND SWITCHBOARDS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide circuit breaker panelboards as indicated in the panelboard schedules and on the drawings. Panelboards shall be equipped with bolt-on thermal-magnetic molded case circuit breakers with frame and trip ratings as shown on the panel schedule.

1.02 RELATED WORK

A. Fire Rated Penetrations: See Section 26 03 00.

1.03 SUBMITTALS - Provide shop drawing submittals including Time Current Curves for all circuit breakers. Provide circuit breaker characteristic trip curves for every circuit breaker. See Section 26 00 00 and Section 26 02 00.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 ACCEPTABLE MANUFACTURERS

NOTE: See Material Schedule and Panel Directories on Drawings.

2.02 CIRCUIT BREAKERS

A. Interrupting ratings shall be at least 22,000 rms symmetrical amperes unless otherwise noted on the Electrical Drawings. Single pole, 15 and 20 ampere circuit breakers intended to switch fluorescent lighting loads shall carry the SWD marking.

2.03 BUSSING ASSEMBLY AND TEMPERATURE RISE

A. All current carrying parts of the bus structure shall be copper.

2.04 CABINETS AND FRONTS

A. Each front shall include a door. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door.

2.05 EQUIPMENT SHORT CIRCUIT RATING

A. Each panelboard and installed circuit breakers shall have short circuit current ratings equal to or greater than calculated rating developed as part of the coordination and fault current study in paragraph 2.06, below. Panelboards shall be marked with their maximum short circuit current rating at the supply voltage. AIC ratings are not to be based upon series ratings.

PART 3 EXECUTION

SECTION 26 47 40 – PANELBOARDS AND SWITCHBOARDS

3.01 INSTALLATION

A. Provide filler pieces for unused spaces.

B. Prepare and affix typewritten directory to inside cover of panelboard indicating loads controlled by each circuit.

C. The word "spare" on panel directories means to provide a spare circuit breaker of the size shown.

D. The word "space" on panel directories means to provide a blank location where a future circuit breaker could be located.

E. Label branch circuit wiring inside panelboard with descriptive tags.

F. Provide separate insulated/isolated ground bus in every panelboard having branch circuits serving insulated/ isolated receptacles and equipment.

END OF SECTION 26 47 40

SECTION 26 50 10 – LAMPS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide lamps listed in Luminaire Schedule on Drawing or specified herein.

1.02 RELATED WORK

A. Interior Building Lighting.

B. Ballasts and Accessories.

1.03 SUBMITTALS

A. Provide shop drawing submittals.

B. Substitute luminaire proposals shall include point by point footcandle plots submitted for the area to be lighted.

PART 2 PRODUCTS: NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 ACCEPTABLE MANUFACTURERS

A. If lamp manufacturer is not specified on the project drawings, firms regularly engaged in manufacture of Lamps of types and ratings required, whose products have been in satisfactory use in similar service for not less than one year may be provided.

2.02 INCANDESCENT LAMPS

A. Incandescent lamps shall have a minimum rated life of 2500 hours at the wattage and line voltage listed in the Luminaire Schedule.

2.03 FLUORESCENT LAMPS

A. Fluorescent lamps shall be the wattage, size, lumen output and life given in the Luminaire Schedule or attributed to the particular Manufacturer listed. The color of all fluorescent lamps shall be 3500 degrees Kelvin unless noted otherwise on the Drawings.

PART 3 EXECUTION
3.01 INSTALLATION

A. Provide lamps in accordance with the combined instructions of both the lamp Manufacturer and the Luminaire Manufacturer.

END OF SECTION 26 50 10

SECTION 26 52 00 – EXTERIOR BUILDING LIGHTING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Exterior Luminaries.

1.02 RELATED WORK

A. Outlet Boxes, Weatherproof.

B. Lamps/Ballasts.

C. Testing: See Section 26 08 00.

D. Fire Rated Penetrations: See Section 26 03 00.

1.03 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

A. Substitute luminaire proposals shall include point by point footcandle plots submitted for the area to be lighted.

2.01 ACCEPTABLE MANUFACTURERS

A. Refer to Luminaries Schedule on Drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install Weatherproof Outlet Boxes where shown on the Drawings.

B. Install Lighting Equipment on Building where shown on Drawings.

C. Aim Luminaries and lock in place to prevent movement.

D. Provide Lamps and clean Luminaries interior prior to final inspection.

END OF SECTION 26 52 00

SECTION 26 58 00 – EMERGENCY LIGHTING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Emergency Lighting and Exit Signs.

B. Provide AC power to all Self Contained Emergency Powered Exit Signs.

C. Provide AC power to self contained Emergency Light units.

1.02 RELATED WORK

A. Testing: See Section 26 08 00.

B. Fire Rated Penetrations: See Section 26 03 00.

1.03 SUBMITTALS

A. Provide shop drawing submittals.

B. Substitute luminaire proposals shall include point by point footcandle plots submitted for the area to be lighted.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 ACCEPTABLE MANUFACTURERS

A. Refer to Luminaries schedule on drawing for Emergency Lighting System Equipment.

2.02 EMERGENCY BATTERY UNITS

A. Provide fully automatic operation on power failure with minimum operating time of 90 minutes for light heads and exits.

B. Provide battery, fully automatic chargers with built-in test switch, battery state indicator, and mounting brackets.

C. Battery output power shall be fused by manufacturer.

2.03 EMERGENCY LIGHT SYSTEM

A. Battery packs shall have a minimum three year full warranty with a minimum eight year life expectancy.

B. Aim lamps to provide one foot-candle on the floor over the NFPA-101 required means of egress.

SECTION 26 58 00 – EMERGENCY LIGHTING

2.04 EXIT SIGNS

A. Directional arrows shall be provided to point to the location of exits when not directly below exit sign.

PART 3 EXECUTION

3.01 INSTALLATION

A. Aim light heads at floor or stair to provide illumination as specified in the latest edition of the Life Safety Code (NFPA-101).

END OF SECTION 26 58 00

SECTION 26 92 10 – MISCELLANEOUS MECHANICAL EQUIPMENT

PART 1 GENERAL

1.01 WORK INCLUDED

A. Space Heaters.

B. Pump Motor Disconnect Switches and Connectors.

C. Miscellaneous Mechanical Equipment.

D. Thermostat Controls.

E. Exhaust Fan and Controls.

1.02 RELATED WORK

A. Testing: See Section 26 08 00.

B. Fire Rated Penetrations: See Section 26 03 00.

1.03 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 ACCEPTABLE MANUFACTURERS

A. Refer to accessory requirements and recommendations by Manufacturer of mechanical equipment being provided.

PART 3 EXECUTION

3.01 INSTALLATION

A. Refer to Mechanical Plans for details of Electrical requirements of Mechanical Equipment not shown on Electrical Plans or described in the project Electrical Specification.

B. Refer to Mechanical plans for details of electric equipment supplied with mechanical systems.

C. Provide manual, automatic, and automatic with H-O-A type motor starters in accordance with requirements of the Mechanical and Plumbing Drawings and Specifications if not otherwise noted on the Electrical Drawings or Specifications.

D. Provide UL class RK-5 time delay, dual element cartridge fuses sized as shown on Drawing.

Verify equipment load with label plate. If equipment label plate requires a minimum circuit ampacity larger than 80% of the fuse required by the Electrical Drawings, notify the Electrical Engineer immediately.

E. Review Mechanical Drawings and Specifications to identify equipment and material to be provided by the Electrical Contractor that is not covered in the Electrical Drawings and Specifications.

END OF SECTION 26 92 10

SECTION 27 20 00 & 27 30 00 – DATA AND VOICE WIRING SYSTEMS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Telephone System.

1.02 RELATED WORK

A. Fire Alarm System.

B. Testing: See Section 26 08 00.

C. Fire Rated Penetrations: See Section 26 03 00.

1.03 SYSTEMS DESCRIPTION

A. Cable and Outlets to form Signal Distribution System.

B. Provide 4-pair, plenum rated, category 5E cable from each outlet to telephone service entrance. Confirm that this cable will be satisfactory to telephone equipment supplier.

C. The Contractor shall provide all interior building wiring, outlet boxes, telephone plug receptacles, cables, conductors, and connectors as needed to provide an operating system within the Building.

D. The Contractor is not responsible to provide telephone instruments, switchboards, dialers, servers, or remote control equipment.

1.04 REGULATORY REQUIREMENTS

A. The telephone cable, customer side, shall be provided by the Contractor in accordance with the requirements of the Telephone Utility.

1.05 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 MATERIALS

A. Telephone cable shall be as specified by the local Utility.

PART 3 EXECUTION

3.01 INSTALLATION

SECTION 27 20 00 & 27 30 00 – DATA AND VOICE WIRING SYSTEMS

A. Provide telephone signal distribution cables throughout project. Provide a 4-pair, plenum rated, category 5E cable between each telephone outlet and the telephone service entrance backboard. Confirm with telephone equipment supplier that 4-pair cable will be satisfactory.

B. Provide plywood blackboards at service entrance as required. Confirm location on job site prior to installation.

C. Provide an electrical ground for the telephone system.

D. Telephone conductors and cables shall be more than 12 inches away from any other wires.

END OF SECTION 27 20 00 AND 27 30 00

SECTION 27 40 00 – CABLE TELEVISION SYSTEM

PART 1 GENERAL

1.01 WORK INCLUDED

A. Television Distribution System throughout building.

1.02 RELATED WORK

A. Conduit.

B. Outlet Boxes.

C. Plate Covers.

D. Grounding.

E. Testing: See Section 26 08 00.

F. Fire Rated Penetrations: See Section 26 03 00.

1.03 SYSTEM DESCRIPTION

A. System shall provide a satisfactory operating signal level at each outlet location.

1.04 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 EQUIPMENT

A. Wall Outlets: Provide CATV connector type wall plates.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide complete CATV signal distribution system as shown on the electrical drawings.

END OF SECTION 27 40 00

SECTION 28 30 00 – FIRE ALARM SYSTEM

PART 1 GENERAL

1.01 WORK INCLUDED

A. Fully Addressable Fire Alarm Systems.

1.02 RELATED WORK

A. Systems Demonstration.

B. Identification System.

C. Testing: See Section 26 08 00.

D. Fire Rated Penetrations: See Section 26 03 00.

1.03 REFERENCES

A. The Contractor shall coordinate the Fire Alarm installation and verify that the installation is in accordance with the requirements of the local Fire Department and NFPA 72 Series Documents.

B. The Contractor shall provide alarm horns and strobes in accordance with the visible notification requirements of the Americans with Disabilities Act.

1.04 SYSTEM DESCRIPTION

A. Supervised, addressable, non-coded 24 volt DC, "Class A" system.

B. Provide manual fire alarm pull stations, thermal detectors, horns, and sprinkler circuits fully supervised.

C. System shall operate with manual stations, smoke and heat detectors, and sprinkler circuits as follows:

1. Actuate control panel to cause evacuation alarm continuously throughout building.

2. Indicate alarm origin on Fire Alarm Control Panel at the main entrance to building.

3. Transmit signal to Municipal Fire Department.

1.05 REGULATORY REQUIREMENTS

A. Installation subject to approval, inspection, and test of applicable regulatory agency, and the authority having jurisdiction.

B. System design shall be submitted by Contractor to the local Fire Department for final approval prior to system purchase and construction.

SECTION 28 30 00 – FIRE ALARM SYSTEM

1.06 SUBMITTALS

A. Provide shop drawing submittals.

PART 2 PRODUCTS

NOTE: All products shall meet NEMA construction and testing standards and UL listing requirements applicable to the intended use for this project.

2.01 MANUAL FIRE ALARM STATION

A. Manual: Non-coded, semi flush mounted, indicating operation physically until reset, double action, key reset, and non break glass.

2.02 PRODUCTS OF COMBUSTION DETECTORS

A. Provide, where shown, smoke detectors having the following features:

1. Blinking LED for visual supervision of satisfactory operating status (non-alarm).

2. Blinking LED to lock "ON" at full brilliance in alarm.

3. Detector shall be reset from control panel.

4. Complete detector functional test shall be possible without generating smoke.

2.03 ALARM DEVICES

A. All alarm devices shall be combined audio-flashing visual strobe units except where otherwise shown on the electrical drawings.

B. After installation, the whopping sound level output of the horn shall be not less than 87 dBA at 10 feet, omni-directional.

C. After installation, the visible signaling device shall flash approximately but not less than once in every two seconds and the effective intensity shall as shown on the electrical drawings. All strobes throughout the project shall be synchronized to flash at the same time.

D. Minimum rated life for combined audio-visual unit shall be 200 hours of continuous operation.

E. Horn/strobe alarm units connected to auxiliary contacts on single station smoke detectors shall have the same dB and candlepower and shall operate on 120 VAC. (Not required to have slow whoop.)

2.04 CONTROL PANEL

A. Steel construction, hinged front cover, key locked.

B. Provide control panel for connection to master box and local Fire Department.

C. Equip panel with:

1. Door mounted annunciator panel.

2. Separate trouble light for each zone.

3. Trouble buzzer light and trouble silence switch.

4. Separate trouble light to supervise standby power.

5. System reset switch.

6. Provide zone disconnect switches.

7. See system riser diagram on Electrical Drawings for minimum functional requirements.

D. Provide supervision of system as follows: A break or a ground on a circuit to a fire alarm station, detector, alarm, shall cause a trouble signal, with trouble lamp illuminated. Trouble signal silence switch silences buzzer but lamp remains illuminated. On restoration of the system, the trouble signal to remain energized until trouble signal silence switch is restored to normal. On loss of normal AC power, the trouble alarm operates and illuminates emergency power supervisory pilot lamp. Operation of the trouble alarm silence switch silences trouble signal but power supervisory lamp remains illuminated. On restoration of normal power, trouble alarm remains energized until the silence switch is restored to normal.

E. Incorporate relays in control panel to control and activate systems referenced under Related Work and Master Box.

2.06 POWER SUPPLY (NORMAL AND STANDBY)

A. Take normal power supply from independent 120 volt, 20 ampere circuit.

B. Provide rectifier as part of control panel or as separate unit to automatically maintain standby battery bank fully charged under normal conditions and sized to recharge standby batteries in 12 hours maximum, following emergency operation. Rectifier to operate the system when batteries are disconnected.

C. Provide standby battery bank floating across the line. Provide batteries of sufficient capacity to operate system under standby load conditions without recharging for 60 consecutive hours and then have sufficient power left to operate complete system in alarm for 5 minutes. Mount batteries in a steel locked enclosure located where ambient temperatures will be 40 degrees F (4 degrees Centigrade) minimum.

D. Provide 120 VAC power to door holding magnets through control module in fire alarm control panel.

SECTION 28 30 00 – FIRE ALARM SYSTEM

2.07 SINGLE STATION SMOKE DETECTORS

A. Unit shall be powered from 120 VAC.

B. Unit shall have externally operated test switch.

C. Unit shall have 135 degree fixed temperature heat detector.

D. Unit shall have at least one N.O. contact for remote alarm switching.

E. Unit shall be photoelectric type alarming at 1.5% per foot obscuration.

2.08 MAGNETIC DOOR HOLDERS

A. Magnetic door holders shall operate on 120 VAC controlled by a relay in the main fire alarm control panel.

B. After installation, magnetic door holders shall have a minimum of 25 pound holding force on door to prevent its closing.

C. Magnetic door holders shall be wall mounted at top of door unless otherwise noted on Electrical Plans.

2.09 ELECTRIC STRIKES

A. Electric strikes are to be provided for second floor passage doors as shown. These electric strikes are to be released by the fire alarm system when the fire alarm system is in alarm.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide exposed fire alarm wiring in electrical metallic conduit with red paint or red tape at 3' intervals. Wire system class "A".

B. Wire Size: All conductors shall be sized so that system components operate as specified.

C. Fire alarm conductor terminations in control panel shall be made on terminal strips with separate point for each conductor. All such strips to be number identified as shown on wiring diagram attached to inside of door of control panel. Connect wiring neatly to terminal strips. Set up termination of cabling so that sections of the system may be isolated or shorted out for servicing.

D. Flush mount magnetic door holders at top of each door and connect to fire alarm control panel so that doors close when alarm sounds.

E. From fire alarm control panel provide one 3/4 inch conduit to nearest telephone backboard or panel location for tie-in to central station.

F. Mount manual pull station fire alarm boxes with top of box at 48 inches above finished floor.

G. Provide power supply circuit breaker with lock "ON" device in a location that is accessible only to authorized personnel.

H. Single station smoke detectors shall be AC powered from a "House" supply with internal battery backup.

I. The horn-light units shall be mounted in such a manner as to meet the requirements of NFPA-72, the Americans with Disabilities Act, and State and Local building codes and ordinances. See test requirements under paragraph 3.02 below.

3.02 FIELD QUALITY CONTROL: See Section 26 08 00.

3.03 FIRE ALARM SYSTEM CERTIFICATION

A. After satisfactory completion of an operational acceptance test (see Section 26 08 00), a Certificate of Compliance (NFPA-72A Figure 2-2.4) shall be completed and delivered to the Electrical Engineer for review and acceptance. After acceptance by the Electrical Engineer, copies of the Certificate of Compliance shall be provided to the Owner, the local Fire Department and authorities having jurisdiction.

END OF SECTION 28 30 00

END OF ELECTRICAL SPECIFICATION