SECTION 1

SHORT FORM
INSTRUCTIONS TO BIDDERS

STATE PROJECTS

1. At the time of the opening of Proposals, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Plans and Contract Documents, including all Addenda. The failure or omission of any Bidder to receive or examine any form, instrument, or document shall in no way relieve any Bidder from any obligation in respect to his Proposal. The Owner reserves the right to accept or reject any or all Proposals as may best serve the interest of the Owner.

2. Subject to the Owner's right, reserved herein, to accept or reject any or all Proposals, the General Contractor will be selected on the basis of the sum of the lowest acceptable Proposal plus such of the Alternates as the Owner desires to use.

3. The Owner is exempt from the payment of Federal Excise Taxes on articles not for resale and the Federal Transportation Tax on all shipments. The Contractor shall quote less these taxes. Upon application, exemption certificates will be furnished when required.

4. Maine State Sales and Use Taxes should not be included in your quotation as the Owner is exempt from the payment of such taxes.

5. No Proposal may be withdrawn during a period of thirty (30) calendar days immediately following the opening thereof.

6. No Contract may be assigned, sublet or transferred without the written consent of the Owner.

7. In accordance with Title 5, M.S.R.A., Section 1743, no General Contractor shall sublet more than 80% of the Contract Amount.

8. (a) All foreign corporations intending to do business in the State of Maine must comply with provisions of 13-A M.R.S.A., Chapter 12. Any Foreign Corporation receiving Notice of Award of Contract shall contact the Secretary of State for the purpose of complying with this Statute.

(b) All individuals not residents of this State must comply with the provisions of Title 14 M.R.S.A., Section 704.

(c) It may be necessary for the Contractor to submit to the Owner documentary evidence that the above provisions have been complied with.

9. For contract awards greater than $100,000, the selected General Contractor will be required to furnish a 100% Contract Performance Bond and a 100% Contract Payment Bond to cover the execution of his Contract. Form of Bonds are shown in Section 2-C2 and 2-C3 when applicable.

10. Contractors may be required to furnish a statement of their business experience, record of accomplishments, and financial responsibility at the discretion of the Owner.

11. The Owner shall retain five percent (5%) of each payment due the Contractor as part security for the fulfillment of the Contract by the Contractor. The Owner may, if he deems it expedient to do so, cause the Contractor to be paid temporarily or permanently from time to time during the progress of the work such portion of the amount retained as he deems prudent or desirable. In case such payments are made, the Owner may at any time withhold further payments until the full amount of the five percent (5%) is re-established, all in accordance with the provisions of Title 5, M.R.S.A., Section 1746.

Chapter 437, Public Laws of 1967 allows the Contractor to deposit with the Treasurer of State certain Government Bonds in place of retention of payment due Contractors in State Contracts.

12. The Proposal shall be based on the Materials, Methods, Equipment and Products as specified.

Any Materials, Methods, Equipment or Products not herein specified, but deemed worthy of consideration by any General Contractor, may be introduced by a separate letter attached to his Proposal. He shall state the cost comparison with the specified Materials, Methods, Equipment or Products and the reason for the suggested substitution.

It shall be understood by the General Contractor or Subcontractor that the attached letter describing the proposed change will not be used in determining the low General or Subcontract proposal submitted unless the General or Subcontractor shall have submitted their list to the Architect/Engineer 10 days prior to the date set for the receipt of their respective proposals and shall have received written approval by the Architect/Engineer.

13. If, in the performance of this Contract, a dispute arises between the Owner and the Contractor which cannot be settled, then this dispute shall be submitted to Arbitration and both the Owner and the Contractor shall be bound by the decision of the Arbitrator.

The membership of the American Arbitration Association shall be used as Arbitrators and the procedures used for Arbitration shall be in conformity with the Construction Industry Arbitration Rules as administered by the American Arbitration Association.

14. Projects which require compliance with the Davis-Bacon Act are subject to the regulations contained in Title 29, Subtitle A, Part 5 of the code for Federal Regulations, and the Federal Wage Determination attached to and made a part of these Instructions to Bidders.

15. (a) Listing of Job vacancies; Executive Order No. 5, dated December 6, 1971, requires "that the Contractor, or any Subcontractor holding a Contract directly under that Contractor, shall, to the maximum feasible, list all of its suitable employment openings with the Maine Employment Security Commission."

This provision shall not apply to employment openings which the Contractor proposes to fill from within its own organization.:

Two copies of a "Quarterly Report of New Hires" shall be prepared by the 7th day of January, April, July and October for the calendar quarter to which date pertains and sent to the local office of the Maine Employment Security Commission.

A copy of the reporting form is attached to these Instructions to Bidders. These may be obtained from the nearest office of the M.E.S.C. serving the area.

(b) Code of Fair Practices: Executive Order No. 11, dated July 1, 1972, requires that every State Contract for Public Works contain the following provisions: "During the performance of this Contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religious creed, sex, national origin, ancestry or age. Such action shall include, but not be limited to the following: Employment, upgrading, demotions, transfers, recruitment or recruitment advertising; layoffs or terminations; rates of pay or other forms of compensation; and selection for training including apprenticeship.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religious creed, sex, national origin, ancestry or age.

(3) The Contractor will send to each labor union or representative of the workers with which he has a collective or bargaining agreement, or other Contract or understanding, whereby he is furnished with labor for the performances of his Contract, a notice, to be provided by the contracting Department or Agency, advising the said labor union or workers' representative of the Contractors commitment under this section and shall post copies of the notice in conspicuous places available to employees and to applicants for employment."

(4) The Contractor will cause the foregoing provisions to be inserted in all Contracts for any Work covered by this Agreement so that such provisions will be binding upon each Subcontractor.

16. OSHA - Safety Regulations. This Project is subject to compliance with all requirements of the Occupational Safety and Health Administration, Volume 36, No. 105 of the Federal Register, U.S. Department of Labor published Saturday, May 29, 1971, as amended.

17. Any Proposal that contains an escalation clause will be invalid.

QUARTERLY REPORT OF NEW HIRES

(To be completed by Federal Contractors and Subcontractors subject to Executive Order 11598)

	NUMBER OF HIRES
1. TOTAL NEW HIRES	
2. VIETNAM-ERA VETERANS HIRED	
Quarter Ending...	Date Submitted...

These report forms are being supplied as a convenience to Federal Contractors and Subcontractors to meet their reporting requirements on hires in accordance with Federal regulations (41 CFR 50-250) implementing Executive Order 11598.

Instructions for Submittal of Report

Line 1 - Enter the total number of new hires, including Vietnam-era veterans, during the period covered.

Line 2 - Enter the number of Vietnam-era veterans hired during the period covered.

Two copies of this report should be submitted to the local office of the Maine Employment Security Commission serving the area by the 7th of the month following the calendar quarter to which data pertain. A Contractor or Subcontractor with more than one establishment in a State may submit the quarterly reports for all such establishments to the Maine Employment Security Commission, 20 Union Street, Augusta, Maine, Attn: Employment Service Division.

Definitions

(1) New Hires are temporary or permanent additions to the employment roll or (a) anyone who has never been employed by the organization, or (b) former employees who were not called back by the employer or are not returning from military leave.

(2) Vietnam-Era Veteran. A veteran separated on or after August 5, 1964, and who has received other than a dishonorable discharge.

Any questions regarding this matter should be referred to the nearest office of the Maine Employment Security Commission

SUBMITTED BY:	
Name of Firm	Signature
Street Address	
City, State, Zip	Title

MA 5-82.1 (12/71)

SUPPLEMENT TO SPECIAL PROVISIONS

EXECUTIVE ORDER #5

APPLICABLE TO "STATE CONTRACTORS AND SUBCONTRACTORS"

All State contracts negotiated on or after December 6, 1971, shall include a clause requiring the Contractor, or any Subcontractor holding a contract directly under that Contractor, to the maximum feasible, to list all of its suitable openings with the Maine Employment Security Commission.

Such a clause will require the Contractor and any Subcontractor to list all job openings in his organization in Maine, whether the jobs are generated by the contract or not. Excepted from listing will be jobs which the Contractor will fill:

1. Through promotion or transfer of employees already in his organization;

2. Through recall of former employees on lay-off status;

3. Through a bona-fide employer-union agreement which requires new hires to be made only through union sources.

The contract will not require hiring only from applicants referred by the Maine Employment Security Commission. The Contractor will be free to make his own hiring decisions.

Reporting

To determine the effectiveness of the order in providing jobs for Vietnam veterans, State Departments and Agencies, Contractors and their Subcontractors will be required to file quarterly reports with the Maine Employment Security Commission. n These reports will indicate only the total number of individuals hired during the reporting period and the number of personnel hired who were Vietnam-era veterans (in service on or after August 5, 1964) who received other than a dishonorable discharge. Such reports will be due not later than the 7th day of the month following the end of each calendar quarter (e.g. April 7, 1972 for the quarter ending March 31, 1972). Report forms (sample attached) will be available from the Maine Employment Security Commission.

SECTION 2-A
NOTICE TO CONTRACTORS
SHORT FORM
STATE CONTRACTS
(Advertisement)

SUBJECT TO AVAILABILITY OF STATE FUNDS

Sealed Proposals, in envelopes plainly marked Proposal for:

STRUCTURAL UPGRADE AND REPLACE ROOFING SYSTEM FOR DRILL HALL AREA AT STEVENS AVE. ARMORY, PORTLAND, MAINE
[Project Number AP03-063C]
[Bid Number 03-003]
[Wage Determination Number B2-006-2003]

Brief Job Description:

The Work of the Contract involves new roofing system for drill hall area. Remove existing roof drains, surfacing materials, including asbestos and wood decking. Structural modifications to the existing roof truss system including lead abatement. Install new metal decking, roof insulation, roof drains new rain water piping and E.P.D.M. roofing system, and miscellaneous mechanical and electrical removal and reinstallation, in accordance with Plans and Specification.

Prepared By: Allied Engineering, Inc.
For:
Directorate of Facilities Engineering
Building 8, Camp Keyes
Augusta, Maine 04333-0033
Bid #03-003

Proposals will be opened and read aloud at Camp Keyes, Building 8, on **March 4, 2003 at 1.00 p.m.**

All proposals greater than $100,000.00 must be accompanied by certified or cashiers check for 5% of the Proposal, or a satisfactory Bid Bond in a similar amount. The Owner reserves the right to waive all formalities, and reject any and all Proposals, or to accept any Proposal. Proposals shall be submitted upon the letterhead of the Bidder.

For contract awards greater than $100,000.00 the successful Bidder will be required to furnish 100% contract Performance Bond and a 100% contract Payment Bond to cover the execution of the Work which shall be in conformity with the Form of Bonds contained in Section 2-C of the specifications and for the Contract Amount.

Any Proposal that contains an escalation clause will be invalid.

Plans and specifications may be obtained from the following for a non-refundable fee of $75.00:

Directorate Facilities Engineering
Building #8, Camp Keyes
Augusta, ME 04333-0033
Mr. Bill Vanwickler
(207) 626-7849

Plans and specifications will also be available for review at the following locations:

F.W. Dodge
47 Atlantic Place
So. Portland, ME 04106
(207) 774-3488

The Dunlap Corp.
31 Court St.
Auburn, ME 04212-0040
(207) 783-2211

Construction Summary of Me.
734 Chestnut St.
Manchester, NH 03104
(603) 627-8856

Assoc. Constructors of Me.
188 Whitten Rd.
Augusta, ME 04332-5519
(207) 622-4741

Directorate Facilities Engineering
Building #8, Camp Keyes
Augusta, ME 04333-0033
(207) 626-4346

A Pre-bidding Conference is scheduled on-site at Stevens Ave. Armory, Portland, Maine, right side of building parking area, on, **February 24, 2003 at 10:00 a.m.**

OWNER:
JOHN W. LIBBY
Deputy Commissioner

We comply with all 504 Architectural Handicapped Accessibility Standards.

SECTION 2-B

PROPOSAL

BIDDER_____

_____

TO: DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
MILITARY BUREAU
Headquarters, Maine National Guard
Building 8, Camp Keyes, 194 Winthrop Street
Augusta, Maine 04333-0033

A. Having carefully examined the forms of Contract, General Conditions, Plans and Specifications dated January 2003, prepared by the Directorate of Facilities Engineering, for:

STRUCTURAL UPGRADE AND REPLACE ROOFING SYSTEM FOR DRILL HALL AREA, AT STEVENS AVE. ARMORY, PORTLAND, MAINE.
Project Number AP03-063C

as well as the premises and conditions affecting the work, we the undersigned propose to furnish all labor, equipment and materials necessary for and reasonably incidental to the construction and completion of this Proposal for the amount of:

DESCRIPTION OF BASE BID:
The Work of the Contract involves new roofing system for drill hall area. Remove existing roof drains, surfacing materials, including asbestos and wood decking. Structural modifications to the existing roof truss system including lead abatement. Install new metal decking, roof insulation, roof drains new rain water piping and E.P.D.M. roofing system, and miscellaneous mechanical and electrical removal and reinstallation, in accordance with Plans and Specification.

Base Bid Drawings consist of:

	Cover Sheet
S-000	Structural Notes
SD-100	Demolition Plan-Structural and Mechanical
SF-100	Roof Framing Plan
SE-100	Roof Plan
MH-100	Mechanical Roof Plan

Base Bid . . . . . .Lump Sum. Dollars $_____

B. This Proposal includes the following addenda to the Plans and Specifications:

Addendum No._____, Dated _____.
Addendum No._____, Dated _____

C. The undersigned acknowledges that all prices within this Section, 2-B PROPOSAL, must filled in, to include Base Bid, Added Alternates and Unit Prices; or the Bidder will be considered non-responsive and this bid will be rejected.

The undersigned agrees, if awarded the Contract, the Contractor shall not start work until 1 May 2003 and all work shall be completed before 20 July 2003. The Contact will terminate on 15 August 2003.

D. The undersigned agrees, if the Proposal is accepted, to sign a Contract and deliver it, along with the affidavits of all insurance's specified within 3 calendar days after the date of notification of such acceptance, except if the 3rd day falls on a holiday, a Saturday, or a Sunday then the conditions will be fulfilled if the required documents are received before 12:00 o'clock noon the day following the holiday, or the Monday following the Saturday or Sunday.

SIGNED BY: _____

_____

_____

Address

Note: If Bidder is a corporation, write State of incorporation, and if a partnership; give full names of all partners.

SECTION 2-C1

SHORT FORM
FORM OF GENERAL CONTRACT BID BOND

Know all men by these presents, that we, the undersigned, (1) _____ _____, (2) _____as Principal, and (3) ___ _____ as Surety, are hereby held and firmly bound unto (4) _____ in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns, signed this (5) _____ day of _____, 20___.

The condition of the above obligation is such that whereas the Principal has submitted to (6) Owner _____ _____ _____ a certain Proposal, attached hereto and hereby made a part hereof, to enter into a Contract in writing, for the construction of (7) _____ _____ _____.

Now therefore:

(a) If said Proposal shall be rejected, or, in the alternate,

(b) If said Proposal shall be accepted and the Principal shall execute and deliver a contract in the form of Contract attached hereto (properly completed in accordance with said Proposal) and shall furnish a bond for his faithful performance of said Contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Proposal, then this obligation shall be void, otherwise the same shall remain in force and effect: it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time within which the Principal may accept such Proposal: and said Surety does hereby waive notice of any such extension.

In witness whereof, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and seals this (5) _____ day of _____, 20___.

Witness:

_____

_____

_____

Contractor: _____

by _____ (L.S.)

by _____ (L.S.)

by _____ (L.S.)

Witness:

_____

_____

Surety: _____

by _____ (L.S.)

by _____ (L.S.)

Approved as to form _____, 20___.

By _____
(Owner's Attorney)

Legend

(1) Correct name of Contractor.
(2) A Corporation, a Partnership, or an Individual, as the case may be.
(3) Correct name of Surety.
(4) Treasurer of the State of Maine.
(5) Same date as that of Contract.
(6) Owner shall be the State of Maine.
(7) Name of project as designated in the Contract Documents.

If Contractor is Partnership, all Partners should execute Bond. A Power of Attorney document, together with a statement that it still is in full force and effect shall be provided by the person executing this Bond. Bond must be countersigned by a Resident Maine Agent.

SECTION 2-C2

SHORT FORM
FORM OF GENERAL CONTRACT PERFORMANCE BOND
(State Projects)

Know all men by these presents, that we, the undersigned, (1) _____ _____, (2) _____ as Principal, and (3) ___ _____ a Corporation duly organized under the laws of the State of _____ and having a usual place of business in _____ _____ as Surety, are held and firmly bound unto the (4) _____ _____ in the sum of _____ dollars ($ _____ _____), this to be paid said (4) _____ or his successors in office, for which payment well and truly to be made, Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal shall promptly and faithfully perform the Contract entered into on the (5) _____ day of _____, AD 20_____ for the construction of (6) _____ _____ then this obligation shall be null and void: otherwise, it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the (7) Owner.

Signed and sealed this (5) _____ Day of _____, 20____.

Witness:

_____

_____

_____

Contractor: _____

by _____ (L.S.)

by _____ (L.S.)

by _____ (L.S.)

Witness:

_____

_____

Surety: _____

by _____ (L.S.)

by _____ (L.S.)

Approved as to form _____, 20____.

By _____
(Owner's Attorney)

Legend

(1) Correct name of Contractor.
(2) A Corporation, a Partnership, or an Individual, as the case may be.
(3) Correct name of Surety.
(4) Treasurer of the State of Maine.
(5) Same date as that of Contract.
(6) Name of project as designated in the Contract Documents.
(7) Owner shall be the State of Maine.

If Contractor is Partnership, all Partners should execute Bond. A Power of Attorney document, together with a statement that it still is in full force and effect shall be provided by the person executing this Bond. Bond must be countersigned by a Resident Maine Agent.

SECTION 2-C3

SHORT FORM
FORM OF GENERAL CONTRACT PAYMENT BOND
(State Projects)

Know all men by these presents, that we, the undersigned, (1) _____ _____, (2) _____ as Principal, and (3) ___ _____ a Corporation duly organized under the laws of the State of _____ and having a usual place of business in _____ _____ as Surety, are held and firmly bound unto the (4) _____ _____ in the sum of _____ dollars ($ _____ _____), for the use and benefit of Claimants* as herein below defined, for the payment whereof Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal shall promptly satisfy all claims and demands incurred for all labor and materials, used or required by him in connection with the work contemplated in the Contract entered into on the (5) _____ day of _____, AD 20 for the construction of (6) _____ _____ and shall fully reimburse the obligee for all outlay and expense which said obligee may incur in making good any default of said Principal, then this obligation shall be null and void: otherwise, it shall remain in full force and effect.

*A Claimant is defined as one having a direct Contract with the Principal or with a Subcontractor of the Principal for Labor, Material, or both, used or reasonably required for use in the performance of the Contract.

Signed and sealed this (5) _____ day of _____, 20___.

Witness:	Contractor: _____
_____	by _____ (L.S.)
_____	by _____ (L.S.)
_____	by _____ (L.S.)
Witness:	Surety: _____
_____	by _____ (L.S.)
_____	by _____ (L.S.)

Approved as to form _____, 20___.

By _____
(Owner's Attorney)

Legend

(1) Correct name of Contractor.
(2) A Corporation, a Partnership, or an Individual, as the case may be.
(3) Correct name of Surety.
(4) Treasurer of the State of Maine.
(5) Same date as that of Contract.
(6) Name of project as designated in the Contract Documents.

If Contractor is Partnership, all Partners should execute Bond. A Power of Attorney document, together with a statement that it still is in full force and effect shall be provided by the person executing this Bond. Bond must be countersigned by a Resident Maine Agent.

SECTION 2-E

STATE OF MAINE
SHORT FORM
CONTRACT AGREEMENT
(State Projects)

THIS AGREEMENT made the _____day of_____ in the year Two Thousand and _____by and between the State of Maine, through the _____ _____duly authorized and empowered by virtue of the laws of the State of Maine, hereinafter called the Owner and_____ _____herein after called the contractor.

Approp. No. _____

WITNESSETH,
That the Owner and the Contractor for the considerations hereinafter named agree as follows:

ARTICLE 1. SCOPE OF WORK

The contractor shall furnish all of the materials and perform all the work shown on the plans and described in the specifications entitled_____Prepared by _____. _____ acting as in these contract documents entitled the architect; and shall do everything required by this agreement, the general conditions and special provisions of the contract, the specifications and the drawings.

ARTICLE 2. TIME OF COMPLETION

The Contractor shall not start work until 1 May 2003 and all work shall be completed before 20 July 2003. The Contact will terminate on 15 August 2003.

ARTICLE 3. THE CONTRACT SUM

The owner shall pay the contractor for the performance of the contract, subject to additions and deductions provided therein, in current funds as follows:
_____ $_____).

ARTICLE 4. CONTRACT BOND

The contractor shall furnish the owner the approved contract bonds (as per Article 28 of the standard general conditions) in the amount of 100% of the contract sum.

ARTICLE 5. PROGRESS PAYMENTS

The owner shall make payments on account of the contract as provided therein as follows: each month 95% of the value, based on contract prices of labor and materials incorporated in the work and of materials suitably stored at the site thereof up to the first day of that month, as certified by the architect.

The owner may cause contractor to be paid such portion of the amount retained hereunder in accordance with Article 24 of the general conditions.

ARTICLE 6. FINAL PAYMENT

Final payment shall be due 60 days after completion and acceptance of the work, provided the contractor has submitted evidence satisfactory to the owner that all payrolls, material bills and other indebtedness connected with the work has been paid.

ARTICLE 7. THE CONTRACT DOCUMENTS

The general conditions of the contract, instructions to bidders, the proposal, the special provisions, the specifications and the drawings, together with this agreement form the contract, and they are as fully a part of the contract as if hereto attached or herein repeated. The following is an enumeration of the specifications and plans.

SPECIFICATIONS:

SECTION 1 — Bidding Instruction and Information:

- 1-A Instructions to Bidders

SECTION 2 — Forms:

- 2-A Notice to Contractors
- 2-B Proposal
- 2-C1 General Contract Bid Bond
- 2-C2 General Contract Performance Bond
- 2-C3 General Contract Payment Bond
- 2-E Contractor Agreement

SECTION 3 — Conditions of Contract:

- 3-A General Conditions State Projects
- 3-B Special Conditions State Contracts
- 1742-B Municipal Building Ordinance
- 3-C Wage Determinations

SECTION 4 — Construction Specifications:

- 01005 Administrative Provisions
- 01560 Environmental Protection
- 02070 Selective Demolition
- 04810 Unit Masonry Assemblies
- 04901 Clay Masonry Restoration And Cleaning
- 05120 Structural Steel
- 05310 Steel Deck
- 05500 Metal Fabrications
- 06100 Rough Carpentry
- 07115 Bituminous Dampproofing
- 07531 E.P.D.M. Membrane Roofing
- 07841 Through-Penetration Firestop Systems
- 07920 Joint Sealants
- 09900 Painting
- 13280 Hazardous Material Remediation
- 15050 Basic Mechanical Requirements
- 16000 Basic Electrical Requirements

SECTION 5 Plans:

	Cover Sheet
S-000	Structural Notes
SD-100	Demolition Plan – Structural and Mechanical
SF-100	Roof Framing Plan
SE-100	Roof Plan
MH-100	Mechanical Roof Plan

ADDENDA:

Addendum No. _____, Dated _____

The owner and the contractor hereby agree to the full performance of the covenants herein.

IN WITNESS WHEREOF the parties hereto have executed this agreement in_____ the day and year first above written.

WITNESS:

_____ BY: _____
Contractor (TITLE)

STATE OF MAINE

WITNESS:

_____ By: _____
John Libby
Deputy Commissioner

APPROVED BY:_____
Director
Bureau of General Services

SECTION 3-A

STATE OF MAINE

STANDARD GENERAL CONDITIONS
AND
CONTRACT WORK
ON STATE PROJECTS

Rev. June, 1999
3-A

INDEX TO ARTICLES OF GENERAL CONDITIONS

ARTICLE 1. **DEFINITIONS**

Whenever the following terms are used in these specifications or the contract, the intent and meaning shall be interpreted as follows:

Architect: The project architect and/or engineer whose name appears on the plans and/or specifications for the project, acting directly or through an authorized representative.

Bid Security: The security designated in the proposal, furnished by bidders as a guaranty of good faith to enter into a contract with the state, should a contract be awarded to that bidder.

Bidder: Any individual, partnership, or corporation submitting a proposal for the performance of the work described under the terms of the contract, acting directly or through a duly authorized representative.

Bureau: The Bureau of General Services

Calendar Days: Consecutive days, as occurring on a calendar, taking into account the day of the week, month, year, and any religious, national, or local holidays.

Change Order: A written agreement between the owner and the contractor, operating as a supplement to the contract, covering correction of: omissions, errors, and discrepancies between the plans and the proposal or estimates; or any alterations in the plans; or additional requirements; work, materials, and incidentals required to complete the construction of the project in an acceptable manner, and setting forth the basis of compensation for that supplemental work, if any. Before any change order modifies or becomes a part of the work, it must be duly signed by the contractor, and the owner, and approved by the Bureau of General Services and the architect.

Contract: A written agreement between the owner and the successful bidder, by which the contractor is bound to perform the work specified, in accordance with plans, specifications, general conditions, and special provisions, that are a part of the contract documents, together with all supplemental agreements by which the owner is bound to compensate the contractor at mutually established and accepted rates or prices.

Contract Bond: The approved forms of security furnished by the contractor and his surety, or sureties, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials, and equipment by the contractor.

Contract Documents: The contract documents consist of the contract, general conditions, special provisions, the plans and specifications including all addenda and all other modifications thereof, that were incorporated in the documents prior to their execution.

Contractor: The individual, partnership, or corporation undertaking the execution of the general contract work under the terms of the contract with the owner, acting directly or through a duly authorized representative.

Director of the Bureau of General Services: The state director of the Bureau of General Services or her duly authorized representative.

Owner: The State of Maine, acting through its duly authorized representative.

Plans: All official drawings or reproductions of drawings pertaining to the work provided for in the contract and such working plans as may be furnished or approved by the owner or architect from time to time.

Project: The entire improvement proposed by the owner to be constructed in part or in whole pursuant to these specifications and contract documents. Where the word "Job" appears it shall mean the project.

Proposal or Bid: The written offer of the bidder, on a form prescribed to perform the work specified.

Provide: The word "provide" shall mean "furnish and install," including connections to services if required, unless specified otherwise.

Clerk of the Works: The authorized representative of the Architect.

State: The State of Maine, acting through its duly authorized representative.

Subcontractor: The individual, the firm or corporation undertaking the execution of any part of the work under the terms of the contract by virtue of a written agreement between itself and the contractor.

Superintendent: The representative of the contractor, authorized by the contractor to receive and fulfill instructions from the architect.

Supplemental Agreement: A supplemental agreement is any agreement entered into between the contractor and the owner with the approval of the bureau and the architect subsequent to the execution of the contract.

Surety: The individual, partnership, or corporation which is bound jointly and severally with the contractor and subcontractor to insure his faithful performance of the contract and for his payment of the bills for labor, materials and equipment by the contractor and subcontractors.

ARTICLE 2. INTENT, CORRELATION AND EXECUTION OF DOCUMENTS

The intent of the contract document is to prescribe a complete work or improvement. The plans, including all revisions, general conditions for contract work, special provisions, instructions to bidders, proposal, contract, contract bond, and all other sections of the specifications, including all addenda, all dated and on file in the Bureau of General Services, prior to the time set for receiving proposals as prepared by the architect, shall each become a part of the contract documents, and all proposals must be based on a full compliance therewith. Any supplemental agreements entered into subsequent to the contract will become a part of said contract.

The contract documents are complementary, and what is called for by any one shall be binding as if called for by all. The intention of the document is that , UNLESS OTHERWISE SPECIFIED, the contractor shall furnish all labor, materials, equipment, items, articles, tools, transportation, insurance, services, necessary supplies, operations or methods and incidentals that may be reasonably required to construct and complete the project, facility, or improvement in a manner necessary for the proper execution of the work. Any deviations from the plans which may be required by the exigencies of the construction, or because of error, will in all cases, be determined by the architect, and authorized in writing subject to approval by the owner and bureau. Materials or work described in words which, so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standards. Since the plans and specifications cover the dimensions and features of the work and do not set forth the analysis of the design, it is the duty of the contractor fulfilling them to ascertain the true intent in any case where it is doubtful.

Work not covered under any heading, section, branch, class, or trade of the specifications, shall not be supplied unless it is shown on the drawings or is reasonably inferable therefrom as being necessary to produce the intended results.

The contractor shall take no advantage of any apparent error or omission in the plans and specifications, and the architect shall be permitted to make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications. Where errors or omissions appear in the contract documents, the contractor shall promptly notify the architect in writing of such errors or omissions. Inconsistencies in the contract documents are to be reported before proposals are received, whenever found.

The Contractor shall, upon his acceptance of a contract and before commencing work, contact the architect and request a preconstruction conference. The purpose of this conference shall be as follows:

1. To introduce the members of the architectural firm and the representative of the owner and to define their responsibilities in connection with this project.

2. To emphasize any special provisions applicable to the project.

3. To establish the work progress schedule and set up procedures for prompt review of all required shop drawings.

4. To provide the contractor with opportunity to discuss points of doubt and any apparent inconsistencies noted in the plans and specifications before proceeding to purchase material or execute the work.

During the further progress of work, regular meetings will be held at time intervals appropriate in the judgment of the architect to review the work progress schedule, general project progress and any other questions which might affect the execution of the contract.

ARTICLE 3: DETAIL DRAWINGS AND INSTRUCTIONS

The architect shall furnish, with reasonable promptness, additional instructions by means of drawings or otherwise, that are necessary for the proper execution of the work. All such drawings and instruction shall be consistent with the contract documents, shall be true developments thereof, and shall be reasonably inferable therefrom.

The work shall be executed in conformity therewith and the contractor shall do no work without proper drawings and instructions.

Immediately after being awarded the contract, the contractor shall prepare an estimated progress schedule and submit same for architect's approval. It shall indicate the dates for starting and completion of the various stages of construction.

ARTICLE 4: COPIES FURNISHED

Unless otherwise provided in the contract documents, the contractor will be furnished, free of charge, copies of all drawings and specifications reasonably necessary for the execution of the work.

ARTICLE 5: SHOP DRAWINGS

The contractor shall check and verify all field measurements and shall submit with such promptness as to cause no delay in the contractor's own work or in that of any other contractor, adequate copies, checked and approved by the contractors of all shop drawings and schedules required for the work of the various trades. The architect shall check and approve, with reasonable promptness, such scheduled drawings only conformance with the design concept of the project and compliance with the information given in the contract documents. The contractor shall make any corrections required by the architect, and shall file with the architect two corrected copies, and shall furnish such other copies as may be needed. The architects approval of such drawings or schedules shall not relieve the contractor from responsibility for deviations from drawings or specifications, unless the contractors have, in writing, called the architect's attention to such deviations at the time of submission and secured the architect's written

approval; nor shall it relieve the contractors from responsibility for errors in shop drawings or schedules.

ARTICLE 6: DRAWINGS AND SPECIFICATIONS

The contractor shall keep, in good order, one copy of all drawings and specifications on the work, which will be made available to the architect and to his representative.

ARTICLE 7: OWNERSHIP OF DRAWINGS

All drawings, specifications and copies thereof furnished by the architect are the property of the architect. They are not to be used on other work without written permission from the architect, and, with the exception of the signed contract set, are to be returned to the architect upon request, or at the completion of the work.

ARTICLE 8: SAMPLES

The Contractor shall furnish for approval, with reasonable promptness, all samples as directed by the architect. The architect shall check and approve such samples, with reasonable promptness, only for conformance with the design concept of the project and for compliance with the project and for compliance with the information given in the contract documents. The work shall be in accordance with approved samples.

ARTICLE 9: MATERIALS, APPLIANCE, EMPLOYEES

Unless otherwise stipulated, the contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and facilities necessary for the execution and completion of the work.

Whenever an article or material is defined by describing a proprietary product, or by using the name of a manufacturer, the term "Or Approved Equal", if not inserted, shall be implied. The specific article or material mentioned shall be understood to establish minimum standards as to the type, function, standard of design, durability, efficiency and quality desired and shall not be construed to exclude other manufacturers' products of comparable quality, design, and efficiency.

Materials and models of items which the contractor alleges to be equal to the materials and methods of items named in the specifications, shall be subject to the written approval by the architect/engineer. If the alleged equals are to receive consideration in the bid award, written approval shall be received from the architect/engineer at least ten days prior to the established bid opening dates. The use of alternate items will not be permitted without the approval of the owner and architect. All approved substitutions shall be in writing and approved by the architect. The contractor shall not be relieved of the responsibility to furnish articles or materials equal in quality, design, and efficiency to those specified because of the approval of such alternate items by the architect. The architect's approval or rejection of a proposed substitution may be based on

any of the previous considerations, and his decision may or may not express reasons for rejection and shall be final. Requests for substitutions shall originate and be submitted by the contractor, not a subcontractor. The materials or equipment shall be sufficiently described to enable the architect to easily identify salient features.

Any material or products not specified in the bidding documents but being worthy of consideration may be introduced by the contractor, or subcontractor. The contractor's submission shall include a cost comparison with the specified material and the reason for the suggested substitution. The basic proposal shall be as specified.

It shall be understood by the general contractor or subcontractor that the attached letter describing the proposed changes will not be used in determining the low general contractor or subcontractor proposal submitted, unless the general contractor or subcontractor has submitted its list to the architect/engineer 10 days prior to the date set for the receipt of their respective proposals and has received written approval by the architect/engineer five days prior to the opening of the bid.

The contractor shall guarantee his work against any defects in workmanship and materials for a period of one year from the date of the written acceptance of the project.

Materials and equipment shall be new, free from defects, perfect and complete, unless otherwise stipulated. Materials or equipment specified or shown on the drawings shall be applied or installed according to the directions with the manufacturer, or the recommendations of an association dealing primarily with the material, unless specifically designated otherwise. The scope of the direction furnished shall include the application of experienced personnel to each trade involved. In no case shall the installation be below the standard recommended by the manufacturer or association.

The contractor shall be responsible to the owner for the suitability of materials and equipment furnished and for full compliance with the specification.

The contractor shall promptly pay all his employees when their pay is due, shall promptly pay when due all bills for materials, supplies and services going into the work, and all bills for insurance, workmen's compensation coverage, federal and state unemployment compensation, and Social Security charges applicable to said project. Before final settlement is made, the contractor shall furnish to the owner affidavits that all said payments have been made.

The contractor shall at all times enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

ARTICLE 10: **ROYALTIES AND PATENTS**

The contractor shall, for all time, secure to the owner the free and undisputed right to the use of any and all patented articles or methods used in the work and shall defend at his own

expense any and all suits for infringement or alleged infringement of such patents, and in the event of adverse award under patent suits, the contractor shall pay such awards and hold the owner harmless in connection with any patent suits that may arise as a result of installations made by the contractor, or to any awards made thereunder.

ARTICLE 11: SURVEYS, PERMITS, LAWS, TAXES AND REGULATIONS

The owner shall furnish all surveys unless otherwise specified.

Permits and licenses necessary for the prosecution of the work shall be secured and paid for by the contractor. Easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the owner, unless otherwise specified.

The contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the contractor observes that the drawings and specifications are at variance therewith, the contractor shall promptly notify the architect in writing and any necessary changes shall be adjusted as provided in the contract for changes in the work. If the contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the architect, the contractor shall bear all costs arising therefrom.

Adherence to the codes promulgated by the BOARD OF CONSTRUCTION SAFETY RULES AND REGULATIONS is required by statute. Copies of the latest rules and regulations may be obtained from the Department of Labor, 54 State House Station, Augusta, Maine 04333-0054.

The State is exempt from the payment of Federal Excise Taxes on articles not for resale and from the Federal Transportation Tax on all shipments. All quotes from the contractor and subcontractors shall be free of these taxes. The State is exempt from the payment of Maine State Sales and Use Taxes. All quotes from the contractor and subcontractors shall be free of these taxes.

ARTICLE 12: LABOR AND WAGES

All contractors and subcontractors shall conform to the labor laws of the State of Maine, and all other laws, ordinances, and legal requirements affecting the work in Maine.

If a wage scale prepared by the Department of Labor is included in the contract documents, such wage scale represents the minimum wages that must be paid to each category of labor employed on the project.

In the employment of laborers, preference shall first be given to residents of the State of Maine who are qualified to perform the work to which the employment relates, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, who may reside in other states.

ARTICLE 13: CONDITIONS AND CARE OF SITE AND PROTECTION OF THE WORK

The contractor shall continuously maintain adequate protection of all work from damage and shall protect the property from injury or loss for the duration of this contract, and shall make good any such damage, injury or loss. The contractor shall adequately protect adjacent property as provided by law and the contract documents.

The contractor shall take all necessary precautions for the safety of employees on the work, and shall comply with all applicable provisions of federal, state, and municipal safety laws and buildings codes, and shall prevent accidents or injury to person on, about, or adjacent to the premises where the work is being performed. The contractor shall erect and properly maintain all necessary safeguards for the protection of workmen and the public at all times, as required by the condition and progress of the work, and shall post danger signs warning against all hazards created by the construction process, such as (but not limited to) protruding nails, hoists, well holes, elevator hatchways, scaffolding, window openings, stairways, and falling materials. The contractor shall designate a responsible member of his organization on the work, whose duty shall be the prevention of accidents. The name and position of any person so designated shall be reported to the architect by the contractor.

The contractor shall return to conditions existing prior to the start of work on the project, all aspects of the site that have not been altered, removed, or otherwise changed permanently by the work. The contractor shall protect all existing buildings, structures, or other features from damage by any operation in connection with the project. Utilities encountered shall be protected and maintained in service until removed or abandoned. The contractor shall exercise care when working around such utilities as may be shown on the plot plan or otherwise found. Such utilities are not to be removed, replaced or abandoned.

The contractor shall protect existing trees, and other aspects of the site which will remain a permanent part of the site from damage during grading, excavation, filling, trucking, etc. If necessary, tree trunks shall be boxed, and barricades set up at sufficient distance to prevent damage to major tree branches.

Should the work or material of this or any other contractor employed by the owner become damaged when reasonably protected, the same shall be replaced by the contractor causing the damage at no expense to the owner.

In an emergency potentially affecting health or life or of serious damage to property or of adjoining property, the contractor, without special instruction or authorization from the architect or owner, is hereby permitted to act on his own discretion, to prevent such threatened loss or injury, and the contractor shall so act, without appeal, if so authorized or instructed. Any compensation claimed by the contractor on account of emergency work, shall be determined by agreement.

ARTICLE 14: **INSPECTION OF WORK**

The architect and his representatives, the Bureau of General Services representatives and the owner, shall at all times have access to the work whenever it is in preparation or progress. The contractor shall provide proper facilities for such access and for inspection.

If the specifications, the architect's instructions, laws, ordinances or any public authority require any work to be specially tested or approved, the contractor shall give the architect timely notice of its readiness for observation by the architect or inspection by another authority, and if the inspection is by another authority than the architect, on the date fixed for such inspection, required certificates of inspection shall be secured by the contractor. Observations by the architect shall be promptly made, and where practicable, prior to work is covered or buried. If any work which will ultimately be covered is covered prior to approval or consent of the architect, it must, if requested by the architect, be uncovered for examination at the contractor's expense.

Reexamination of questioned work may be ordered by the architect, and, if so ordered, the work must be uncovered by the contractor. If such work be found in accordance with the contract documents, the owner shall pay the cost of the reexamination and replacement. If such work be found not in accordance with the contract documents, the contractor shall pay such cost, unless it be found that the defect in the work was caused by a contractor employed as provided in Article 32, and in that event the owner shall pay such cost.

The Bureau of General Services, through its representatives shall make periodic inspections of the work during the course of construction and make recommendations to the architect or engineer, when employed. The architect or engineer, shall provide adequate inspection of materials, equipment, methods, and changes in plans on all projects under his supervision.

ARTICLE 15: **SUPERINTENDENCE: SUPERVISION**

The contractor shall have, during the progress of all work, a competent superintendent and any necessary assistants. The superintendent shall not be changed except with the consent of the owner unless a superintendent proves to be unsatisfactory to the contractor and ceases to be in his employ. The superintendent shall represent the contractor and all directions given to the superintendent in the absence of the contractor shall be as binding as if given directly to the contractor. Important directions shall be confirmed in writing to the contractor. Other directions shall be confirmed on written request in each case. The architect shall not be responsible for the acts or omissions of the superintendent or his assistants.

The contractor shall give efficient supervision to the work using his best skill and attention. He shall carefully study and compare all drawings, specifications and other instructions and shall at once report to the architect any error, inconsistency or omission which he may discover, but he shall not be liable to the owner for any damage resulting from any errors or deficiencies in the contract documents or other instructions by the architect.

ARTICLE 16: CHANGES IN THE WORK

The owner reserves the right to increase or decrease any or all of the items of work indicated in the plans, proposal, and contract, or the elimination of any one or more of such items, without invalidating the contract. As the work progresses, the owner may make such alterations in the plans, in the character of the work, or in the specified coordination of two or more concurrent contracts, as may be considered necessary or desirable in order to complete the construction. Such changes shall in no way invalidate the contract. All such work shall be executed under the conditions of the original contract except that any claim for extension of the time caused thereby shall be adjusted at the time of the ordering such change.

In giving instructions, the architect shall have authority to make minor changes in the work, not involving extra cost, and not in consistent with the purposes of the building or project, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a duly signed change order.

Should the contractor encounter during the progress of the work, latent conditions at the site materially differing from those shown on the drawings or in the specifications, or unknown conditions of an unusual nature differing materially from those already encountered in such work, the attention of the architect shall be immediately called for such conditions before they are disturbed. The architect shall promptly investigate the conditions and if they do so materially differ, the contract shall, with the approval of the owner and the bureau be modified by a change order to provide for any increase or decrease in cost resulting from such conditions.

Should such alterations be productive of increased unit cost, or result in decreased unit cost to the contractor, a fair and equitable sum therefor shall be agreed upon in writing before such work is begun, and shall be added to or deducted from the contract amount, as the case may be, by means of a written change order. The change order shall state the nature of the change, the location, the itemized estimate of unit quantities, the basis for payment, and the reason for the change. Such change order to be on approved forms.

When the change order has been properly signed by all parties and encumbered, it shall become a part of the contract.

The value of any such extra work or change shall be determined in one or more of the following ways:

A. By estimate and acceptance in a lump sum.

B. By unit prices named in the contract or subsequently agreed upon.

C. By cost and percentage or by cost and a fixed fee.

If none of the above methods is agreed upon, the contractor, provided he receives an order as above, shall proceed with the work.

Under case (C), the contractor shall keep and present in such form as the architect may direct, a correct account of the cost, together with vouchers. In any case, the architect shall certify to the amount, including reasonable allowance for overhead and profit, due to the contractor. Pending final determination of value, payments on account of changes shall be made on the architect's certificate.

When the subparagraphs (A) and (C) above are used to determine the value of the work, the allowance for overhead and profit combined, included in the total expense to the owner, shall be based upon the following schedule:

Contractor - for any work performed by the contractor's own forces, 20% of the cost;

Subcontractor - for work performed by subcontractor's own forces, 20% of the cost;

Contractor - for work performed by contractor's subcontractor, 10% of the amount due the subcontractor.

Cost shall be limited to the following: Cost of materials, cost of delivery, cost of labor, including Social Security, old age and unemployment insurance (labor cost may include a pro-ratio share of foremen's time, only in case an extension of contract time is granted on account of the change); workmen's compensation insurance; rental value of power tools and equipment.

Overhead shall include the following: bond premium, supervision, wages of time keepers, watchmen and clerks, small tools, incidental, general office expense, and all other expenses not included in "cost".

If the net value of a change results in a credit from the contractor or subcontractor, the credit given shall be the net cost without overhead or profit. The cost as used herein shall include all items of labor, materials and equipment.

ARTICLE 17: **CLAIMS FOR EXTRA COST**

If the contractor claims that any instructions by drawings or otherwise involve extra cost under this contract, the contractor shall give the architect written notice thereof within 10 days after the receipt of such instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property, and the procedure shall then be as provided for changes in work. No such claim shall be valid unless so made.

ARTICLE 18: **DEDUCTIONS FOR UNCORRECTED WORK**

If the architect and owner deem it inexpedient to correct work injured or done not in accordance with the contract, an equitable deduction from the contract amount shall be made therefor.

ARTICLE 19: DELAYS AND EXTENSION OF TIME

If the contractor is delayed at any time in the progress of the work by an act or neglect of the owner or the architect, or of any employee of either, or by any separate contractor employed by the owner, or by changes ordered in the work or by strikes, lockouts, fire, unusual delay in transportation, unavoidable casualties or by causes beyond the contractor's control, or by any cause which the architect shall decide to justify the delay, then the time of completion shall be extended for such reasonable time as the architect may decide.

No such extension shall be made for delay occurring more than seven days before claim therefor is made in writing to the architect. In case of a continuing cause of delay, only one claim is necessary.

If no schedule or agreement stating the dates upon which drawings shall be furnished is made, then no claim for delay shall be allowed on account of failure to furnish drawings until two weeks after demand for such drawings and not then unless such claim be reasonable.

This article does not exclude the recovery of damages for delay by either party under other provisions in the contract document.

ARTICLE 20: CORRECTION OF WORK

The contractor shall promptly remove from the premises all work condemned by the architect as failing to conform to the contract, whether incorporated or not, and the contractor shall promptly replace and redo the work in accordance with the contract and without expense to the owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

If the contractor does not remove such condemned work within a reasonable time, fixed by written notice, the owner may remove it and may store the material at the expense of the contractor. If the contractor does not pay the expenses of such removal within ten days time, thereafter, the owner may, upon ten days written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the contractor.

The contractor shall remedy any defects due to faulty materials or workmanship and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final payment, or from the date of the owner's substantial usage or occupancy of the project, whichever is earlier, and in accordance with the terms of any special guarantees provided in the contract. The owner shall give notice of observed defects with reasonable

promptness. All questions arising under this article will be decided by the architect, notwithstanding final payment.

ARTICLE 21: OWNERS RIGHT TO DO WORK

If the contractor should neglect to prosecute the work properly or fail to perform any provisions of this contract, the owner, after three days written notice to the contractor may, without prejudice to any other remedy may make good such deficiencies and may deduct the cost thereof from the payment; then or thereafter due the contractor, provided, however, that the architect shall approve both such action and the amount charged to the contractor.

ARTICLE 22: OWNERS RIGHT TO TERMINATE CONTRACT

If the contractor should be adjudged bankrupt, or if the contractor should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account the contractor's insolvency, or if the contractor should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials or if the contractor should fail to make prompt payment to subcontractors or for material, or labor, or persistently disregard laws, ordinance or the instructions of the architect, or otherwise be guilty of a substantial violation of any provision of the contract, then the owner, upon the certificate of the architect that sufficient cause exists to justify such action, may without prejudice to any other right or remedy and after giving the contractor and the contractor's surety seven days written notice, terminate the employment of the contractor and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method the owner may deem expedient. In such case the contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract amount shall exceed the expense of finishing the work including compensation for additional architectural, managerial and administrative services, such excess shall be paid to the contractor. If such expense shall exceed such unpaid balance, the contractor shall pay the difference to the owner. The expense incurred through the contractor's default, shall be certified by the architect.

ARTICLE 23: THE CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

If the work should be stopped under an order of any court, or other public authority, for a period of thirty days, through no act or fault of the contractor or of anyone employed by the contractor, then the contractor, may, upon seven days written notice to the owner and the architect, terminate this contract and recover from the owner, payment for all work executed and any proven loss sustained upon any plant or materials and reasonable profit and damage.

Should the architect fail to issue any certificate for payment, through no fault of the contractor, within seven days after the contractor's formal request for payment or if the owner

should fail to pay to the contractor within 30 days after presentation, any sum certified by the architect, then the contractor may, upon seven days written notice to the owner and the architect, stop the work or terminate this contractor as set out in the preceding paragraph.

ARTICLE 24: **PAYMENTS**

The contractor shall, before the first application for payment, submit to the architect in triplicate a "contract cost breakdown" form acceptable to the architect. If required, this form shall be supported by such evidence as to its correctness as the architect may direct and, unless found to be in error, shall be approved by the architect and used as a basis for payments.

The contractor shall submit to the architect an application for each payment on the latest revision of "Requisition for payment" form, B.P.I. 17-A-61, and, if required, receipts or other vouchers, showing his payments of materials and labor, including payments to subcontractors as required by Article 34.

Application for payment as the work progresses may be made of the owner but no more often than once a month, unless due to unusual circumstance the owner may approve more frequent payment. Said requisition for payments shall be based on the proportionate quantities of the various classes of work completed or incorporated in the work, in accordance with the work progress schedule and the value thereof determined from the contract cost breakdown. Payments, upon authorization of the architect, may be made on account of materials not incorporated in the work but delivered and suitably stored at the site. Such payments shall be conditioned upon submission by the contractor of bills of sale, or such other procedure as will adequately protect the owner's interest including applicable insurance.

In the event any materials are delivered but not yet incorporated in the work, have been included in any said "Requisition for Payment" and payment thereon made and said materials thereafter deteriorate, become damaged or destroyed or for any reason whatsoever become unsuitable or unavailable for use in the work, then the full amount allowed therefore in any previous "Requisition for Payment", shall be deducted from the gross value of any subsequent payment or final payment unless the contractor shall satisfactorily replace said material.

After said "Requisition for Payment" has been prepared by the contractor in the required number of copies, it shall be submitted to the architect for approval. The architect shall verify and approve the "Requisition for Payment", and forward all copies to the owner for processing for payment by the owner.

No certificate issued nor payment made to the contractor, nor partial or entire use of occupancy of the work by the owner, shall be an acceptance of any work or materials not in accordance with this contract. The making and acceptance of the final payment shall constitute a waiver of all claims by the owner, other than those arising from unsettled liens, from faulty work or materials appearing within one year from final payment or from requirement of drawings, or specifications, and of all claims by the contractor, except those previously made and still unsettled.

Title 5 M.R.S.A. § 1746 as amended provides that in any contract awarded for any public improvement, the State shall withhold 5% of the money due the contractor until the project under the contract has been accepted by or for the State, except that when the contract has been substantially completed the State may, upon request, further reduce the amounts withheld if it deems it desirable and prudent, or except when the contractor elects to deposit with the Treasurer of the State certain Government Bonds as provided in Chapter 437, Public Laws of 1967.

ARTICLE 25. **PAYMENTS WITHHELD**

The architect may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary in his reasonable opinion to protect the owner from loss on account of:

A. Defective work not remedied.
B. Claims filed or reasonable evidence indicating probably filing of claims.
C. Failure of the contractor to make payments properly to subcontractors for materials or labor.
D. A reasonable doubt that the contract can be completed for the balance then unpaid.
E. Damage to another contractor.

When the above grounds are removed, payments shall be made for amounts withheld because of them.

ARTICLE 26: **CONTRACTOR'S INSURANCE REQUIREMENTS**

The Contractor shall not commence work under this contract until the Contractor has obtained all insurance required under this article and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on a subcontract until all similar insurance required of the Subcontractor has been so obtained and approved.

The Owner does not warrant or represent that the insurance required under this paragraph constitutes an insurance portfolio which adequately addresses all risks faced by the Contractor or its Subcontractors. The Contractor and Subcontractors of every tier shall satisfy themselves as to the existence, extent and adequacy of insurance prior to commencement of work.

The Contractor and any Subcontractor shall procure and maintain for the duration of the Project insurance of the types and limits set forth under this paragraph and such insurance as will protect themselves from claims which may arise out of or result from the Contractor's or Subcontractor's execution of the work, whether such execution be by themselves or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The insurance coverage provided by the Contractor and any Subcontractor will be primary coverage.

A. Workers' Compensation Insurance

Worker's compensation insurance for all employees on site in accordance with the statutory workers' compensation law of the State of Maine.

Minimum acceptable limits for Employer's Liability are:

Bodily Injury By Accident	$500,000
Bodily Injury by Disease	$500,000 Each Employee
Bodily Injury by Disease	$500,000 Policy Limit.

B. Liability Insurance

1. General Liability Insurance

General liability insurance shall be on a form providing coverage not less than that of the 1996 occurrence version of the Insurance Services Office (ISO) Commercial General Liability Policy. This insurance shall cover bodily injury and property damage liability for all hazards of the Project including premise and operations, products and completed operations, contractual, and personal injury liabilities. It shall include collapse and underground coverage - as well as explosion coverage if explosion hazards exist. Aggregate limits shall apply on a per location or project basis.

Minimum acceptable limits are:

General aggregate limit:	$2,000,000
Products and completed operations aggregate:	$1,000,000
Each occurrence limit:	$1,000,000
Personal injury aggregate:	$1,000,000

2. Automobile Liability Insurance

Automobile liability insurance against claims for bodily injury, death or property damage resulting from the maintenance, ownership or use of all owned, nonowned and hired automobiles, trucks and trailers.

Minimum acceptable limit is $1,000,000 any one accident or loss.

3. Owners Protective Liability

For Contracts exceeding $50,000 in total Contract amount, Contractor shall secure an Owners Protective Liability policy naming the Owner as the Named Insured.

Minimum acceptable limits are:

General aggregate limit:	$2,000,000
Each occurrence limit:	$1,000,000

4. Pollution Liability

In the event that any disruption, handling, abatement, remediation, encapsulation, removal, transport, or disposal of contaminated or hazardous material is required, the Contractor or its Subcontractor shall secure a pollution liability policy in addition to any other coverages

contained in this section. The insurance shall be provided on an occurrence based policy and shall remain in effect for the duration of the Project.

Minimum acceptable limit is $1,000,000 per occurrence.

C. Property Insurance

1. New Construction

The Contractor shall procure and maintain Builder's Risk insurance naming the Owner, Contractor and any Subcontractor as insureds as their interest may appear. Covered causes of loss form shall be all Risks of Direct Physical Loss, endorsed to include flood, earthquake, transit and sprinkler leakage where sprinkler coverage is applicable. Unless specifically authorized in writing by the Owner, the limit of insurance shall not be less than the initial contract amount and coverage shall apply during the entire contract period and until the work is accepted by the Owner.

2. Renovations and/or Additions within Existing State Owned Buildings

Insurance shall be provided by the Owner. The State shall notify Maine Risk Management Division concerning the Project and shall provide the value of the Project and the name of the Contractor. Said insurance coverage shall cover the interests of the Contractor and Subcontractor, as their interests may appear. Covered causes of loss form shall be Risks of Direct Physical Loss, endorsed to include flood, earthquake, transit and sprinkler leakage. Theft coverage is not included. Exclusions common to commercial property policies are applicable. The $500 per occurrence deductible is the responsibility of the Contractor. Should the Contractor or Subcontractor desire coverage in excess of that maintained by the State, it must be acquired by the Contractor and at Contractor expense. A certificate of insurance will be furnished to the Contractor upon request.

D. Certificates of Insurance

Four original copies of all certificates of insurance in a form and issued by companies acceptable to the Owner shall be provided to the architect prior to commencement of work. The certificates shall name as certificate holder the State of Maine, Bureau of General Services, 77 State House Station, Augusta, Maine 04333-0077 and shall contain a provision that coverage afforded under the insurance policies will not be canceled or materially changed unless at least thirty (30) days prior written notice by registered letter has been given to the Owner.

ARTICLE 27: **CONTRACT BONDS**

The contractor shall furnish to the state upon execution of the contract, a contract performance bond and a contract payment bond; each for the full amount of the contract and issued by a surety company or surety companies authorized to do business in the State of Maine as approved by the owner. The bonds shall be in accordance with and executed on the forms furnished in the specifications. The bonds shall allow for any addition or deductions of the contract.

The contract bonds shall continue in effect for one year after final acceptance of each contract to protect the owner's interest in connection with the one year guarantee of workmanship and materials and to assure settlement of claims, for the payment of all bills for labor, materials and equipment by the contractor.

ARTICLE 28: **DAMAGES**

1. The contractor shall indemnify and hold harmless the owner and the architect and their agents and employees from and against all claims, damages, losses, and expenses including attorneys' fees arising out of or resulting from the performance of the work, provided that any such claim, damage, loss, or expense (a) is attributable to bodily injury, sickness, disease or death, or injury to or destruction to tangible property (other than the work itself) including the loss of use resulting therefrom, and (b) is caused in whole or in part by a negligent act or omission of the contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

2. In any and all claims against the owner or the architect or any of their agents or employees, by any employee of the contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 1 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the contractor or any subcontractor under Workmen's Compensation Acts, disability benefit acts or other employee benefit acts.

3. The obligations of the contractor under paragraph 1 shall not exceed to the liability of the architect, the architect's agents or employees arising out of:

(1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or

(2) the giving of or the failure to give directions or instructions by the architect, the contractor, agents or employees provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 29: **LIENS**

Neither the final payment nor any part of the retained percentage shall become due until the contractor shall deliver to the owner a complete release of all liens arising out of this contract, or receipts in full in lieu thereof, and, an affidavit that so far as the contractor has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the contractor, may if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the owner, to indemnify him against any lien. If any lien remains unsatisfied after all the payments are made, the contractor shall refund to the owner all moneys

that the latter may be compelled to pay in discharging such lien, including all cost and reasonable attorney's fee.

ARTICLE 30: **ASSIGNMENT**

Neither party to the contract shall assign the contractor or sublet it as a whole without the written consent of the other, nor shall the contractor assign any money due or to become due to him hereunder, without the previous written consent of the owner.

ARTICLE 31: **MUTUAL RESPONSIBILITY OF CONTRACTORS**

Should the contractor cause damage to any separate contractor on the work, the contractor agrees, upon due notice, to settle with such contractor by agreement or arbitration, if he will so settle. If such separate contractor sues the owner on account of any damage alleged to have been so sustained, the owner shall notify the contractor, who shall defend such proceedings at the contractors expense and if any judgment against the owner arise therefrom, the contractor shall pay or satisfy it and pay all costs incurred by the owner.

ARTICLE 32: **SEPARATE CONTRACTS**

The owner reserves the right to let other contracts in connection with this work under similar general conditions. The contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

If any part of the contractor's work depends on proper execution or results upon the work of any other contractor, the contractor shall inspect and promptly report to the architect any defects in such work that render it unsuitable for such proper execution and results. The contractor's failure so to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his work, except as to defects which may develop in contractor's work after the execution of the contractor's work.

To insure the proper execution of the contractor's subsequent work the contractor shall measure work already in place and shall at once report to the architect any discrepancy between the executed work and the drawings.

ARTICLE 33: **SUBCONTRACTS**

The Contractor shall not sublet any part of this contract without the written permission of the owner.

The contractor shall submit in writing to the architect for approval a complete list of the names of all particular items of work he proposes to furnish and the names of the subcontractors to whom the contractor proposes to sublet work. The subcontractors named shall be reputable firms of recognized standings with a record of satisfactory work. The contractor shall not

employ any subcontractor or use any material until they have been approved, or where there is reason to believe the work will not be accomplished in accordance with the contract documents. The complete list of subcontractors and materials must be submitted for approval to the architect and owner.

The architect shall, on request, furnish to any subcontractor, wherever practicable, evidence of the amounts certified on his account.

The contractor agrees that he is as fully responsible to the owner for the acts and omissions of his subcontractor and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by them, as he is for the acts and omissions of persons directly employed by him.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the owner.

ARTICLE 34: RELATIONS OF CONTRACTOR AND SUBCONTRACTOR

The contractor agrees to bind every subcontractor and every subcontractor agrees to be bound by the terms of the contract documents, the drawings and specifications as far as they are applicable to his work, including the following provisions of this article, unless specifically noted to the contrary in a subcontract approved in writing as adequate by the owner or architect.

The Subcontractor agrees:

A. To be bound to the contractor by the terms of the contract documents, drawings, and specifications and to assume toward the contractor all the obligations and responsibilities that the contractor, by those documents, assumes toward the owner.

B. To submit to the contractor applications for payment in such reasonable time as to enable the contractor to apply for payment as specified.

C. To make all claims for extras, for extensions of time and for damages for delays or otherwise, to the contractor in the manner provided in the general conditions for like claims by the contractor upon the owner, except that the time for making claims for extra cost is one week.

The Contractor agrees:

D. To be bound to the subcontractor by all the obligations that the owner assumes to the contractor under the contract documents, drawings and specifications, and by all the provisions thereof affirming remedies and redress to the contractor from the owner.

E. To pay the subcontractor, upon the payment of certificates, the amount allowed to the contractor on account of the subcontractor's work to the extent of the subcontractor's interest therein.

F. To pay the subcontractor, upon the payment of certificates, if issued otherwise as in section E above, so that at all times the subcontractor's total payments shall be as large in proportion to the value of the work done by the subcontractor.

G. To pay the subcontractor to such extent as may be provided by the contract documents or the subcontract, if either of these provide for earlier or larger payments than the above.

H. To pay the subcontractor on demand for subcontract work or materials as far as executed and fixed in place, less the retained percentage, at the time the certificate should issue, even though the Architect fails to issue it for any cause not the fault of the subcontractor.

I. To make no demand for liquidated damages or penalty for delay in any sum in excess of such amounts as may be specifically named in the subcontract.

J. That no claim for services rendered or materials furnished by the contractor to the subcontractor shall be valid unless written notice thereof is given by the contractor to the subcontractor during the first ten days of the calendar month following that in which the claim originated.

K. To give the subcontractor an opportunity to present and to submit evidence in any progress conference or disputes involving subcontract work.

L. To pay the subcontractor a just share of any fire insurance money received by him, the contractor, under article 26 of the general conditions.

ARTICLE 35: **ARCHITECT'S STATUS**

The architect shall be the owner's representative during the construction period, and he shall observe the work in progress on behalf of the owner. He shall have authority to act on behalf of the owner only to the extent expressly provided in the contract documents or otherwise in writing, which shall be shown to the contractor. He shall have authority to stop the work whenever such stoppage may be necessary in his reasonable opinion to insure the proper execution of the contract.

The architect shall be, in the first instance, the interpreter of the conditions of the contract and the judge of its performance. The architect shall side neither with the owner nor with the contractor, but shall use the architect's powers under the contract to enforce its faithful performance by both.

In case of the termination of the employment of the architect, the owner shall appoint a capable and reputable architect whose status under the contract shall be that of the former architect.

ARTICLE 36: CASH ALLOWANCES

The contractor shall include the contract sum and all allowances named in the contract documents and shall cause the work so covered to be done by such contractors and for such sums as the architect may direct, the contract amount being adjusted in conformity therewith. The contractor declares that the contract amount includes such sums for expenses and profit on account of cash allowances as he deems proper. No demand for expenses or profit other than those included in the contract shall be allowed. The contractor shall not be required to employ for any such work, persons against whom the contractor has a reasonable objection.

ARTICLE 37: USES OF PREMISES

The contractor shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the architect and shall not unreasonably encumber the premises with his materials.

The contractor shall not load or permit any part of the structure to be loaded with a weight which will endanger its safety. The contractor shall enforce the architect's instructions regarding signs, advertisements, fires, and smoking.

If any part of the building is completed and ready for occupancy, the owner may, by written and mutual consent, without prejudice to any of the owner's rights or the rights of the contractor, Enter in and make use of such completed parts of the building. Such use or occupance shall in no case be construed as an acceptance of any work or materials.

ARTICLE 38: CUTTING, PATCHING AND DIGGING

The contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon, or reasonable implied by, the drawings and specifications for the completed structure, and he shall make good after them as the architect may direct.

Any cost caused by defective or ill-timed work shall be borne by the party responsible therefore. The contractor shall not endanger any work by cutting, excavating or otherwise, and shall not cut or alter the work of any other contractor except with the consent of the architect. Cutting, drilling, or patching work of contractors other than the general contractor shall be done only with the permission and instruction of the general contractor and architect. Cutting of structural members must be approved by the architect. All cutting, patching, and digging of other constructors in or about the building shall be done under the supervision of the general contractor who shall be responsible to see that the work is neatly done, and in a manner that will

not endanger the structure or harm the component parts, and that patching and back filling shall be done to restore the structure and surfaces to its original condition.

ARTICLE 39: LAYOUT OF WORK

The contractor shall be responsible for the correct staking out of the new work on the site, and shall employ a competent engineer/surveyor to locate the building on the site. He shall run the axis lines locating the work, establish correct datum points and check each line and point on the site to insure their correctness. All such lines and points shall be carefully preserved throughout the construction.

The contractor shall lay out all work from dimensions given on plans. The contractor shall take measurements and verify dimensions of existing or old work, if any, that affect his work or to which his work is to be fitted. The contractor alone shall be responsible for the correctness of all measurements and shall verify all grades, lines, levels, elevations and dimensions shown on the drawings and report any errors or inconsistencies to the architect prior to commencing work.

ARTICLE 40: WORKMANSHIP

All workmanship, materials, or equipment, either at the site or intended for it shall conform with all respects with the requirements of all the contract documents, and shall be strictly first class, workmanlike installation and the best obtainable from the crafts and trades. Incomplete or careless work will not be allowed. In all cases, the material, equipment, and work shall be equal to or better than the grades specified and the best of their kind that is obtainable for the purpose for which they are intended. The architect's decision on the quality of work shall be final.

All labor shall be performed by mechanics skilled in their respective trades. Prior to submitting a proposal, the contractor shall become familiar with the local labor conditions, skilled and unskilled.

If, in the opinion of the contractor, any work is indicated on the drawings or specified in such manner as would make it impossible to produce work of the highest quality, or should discrepancies appear between drawings, or drawings and specifications, the contractor shall refer the same in writing to the architect for interpretation before proceeding with the work.

If the contractor fails to make such reference, no excuse will be entertained thereafter for failure to carry out the work in the satisfactory manner.

The contractor shall guarantee the contractor's work against any defects in workmanship and materials for a period of one year from the date of the written acceptance of the project.

ARTICLE 41: CLEANING UP

The contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his employees or work, and at the completion of the work he shall remove all his rubbish from and about the building and all his tools, scaffolding, and surplus materials and shall leave his work "Broom Clean" or its equivalent, unless more exactly specified.

In case of failure to comply with the contractor, the owner may perform the cleanup and deduct the cost from any moneys due the contractor.

ARTICLE 42: **DISPUTE RESOLUTION**

If, in the performance of this contract, there arises a dispute between the contractor and the owner that cannot be resolved by the parties to the contract, the dispute shall be referred to the Director of the Bureau of General Services who, at his/her discretion, will submit the dispute to non-binding Alternate Dispute Resolution (ADR) or binding arbitration. If the parties in dispute are not satisfied with the results of ADR, the owner or the contractor may resubmit the dispute to the Director of the Bureau of General Services for binding arbitration.

SECTION 3-B

SPECIAL CONDITIONS
STATE CONTRACTS

1. GENERAL. Work performed under this contract is incident to the implementation of a Federal program with the State. Accordingly, this State contract shall be governed by, and construed according to below listed Federal law(s) as they may affect the rights, remedies, and obligations of the United States. Federal agencies are permitted to require changes, remedies, changed conditions, access to records retention, suspension of work, and other clauses required by the Office of Procurement Policy.

   a. Administrative, contractual or legal remedies in instances where Contractors violate or breach contract terms, and provide for such sanctions and penalties as may be appropriate.

   b. Termination for cause and for convenience by the grantee (State of Maine) including the manner by which it will be effected and the basis for settlement [All contracts in excess of $10,000].

   c. Notice of awarding agency requirements and regulations pertaining to reporting.

   d. Notice of awarding agency requirements and regulations pertaining to patent rights with respect to any discovery or invention which arises or is developed in the course of or under this contract.

   e. Awarding agency requirements pertaining to copyrights and rights in data.

   f. Access by the grantee, the subgrantee, the Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

g. Rention of all required records for three years after grantees or subgrantees make final payments and all other pending matters are closed.

2. EQUAL OPPORTUNITY. Contractors shall comply with Executive Order 11246 of September, 24, 1965 entitled "Equal Opportunity," as amended by Executive Order 11375 of October 13, 1967 and as supplemented by in Department of Labor Regulations [41 CFR Part 60]. [All contracts in excess of $10,000 by grantees and their contractor or subgrantees].

3. COPELAND "ANTIKICKBACK" ACT. Contractors shall comply with the provisions of the Copeland "Antikickback" Act [18 U.S.C. 874] as supplemented in

Department of Labor Regulations [29 CFR Part 3]. [All contracts for construction or repair.]

4. DAVIS-BACON ACT. The Contractor shall comply with the Davis-Bacon Act (40 U.S.C. 276a to a-7) as supplemented by U.S. Department of Labor Regulations (29 CFR Part 5). All rulings and interpretations of the Davis-Bacon Acts contained in 29 CFR Part 5 are incorporated by reference in this contract. This provision applicies to all contracts excess of $2,000 when required by Federal program grant legislation. The applicable Davis-Bacon Wage Rate [when applicable] is included Section 3-C, Wage Rates. When not applicable, a State of Maine Wage determination may be substituted in Section 3-C wage rates. In cases where the Davis-Bacon wage determination is applicable, the State Wage Rate will not be used.

5. CONTRACT WORK HOURS. The Contractor shall comply with sections 103 and 107 of the Contract Work Hours and Safety Standards Act [40 U.S.C. 327-330] as supplemented by Department of Labor Regulations [29 CFR Part 5]. [Construction contracts in excess of $2,000, and in excess of $2,500 dollars for other contracts which involve the employment of mechanics or laborers.]

6. ENVIRONMENTAL PROTECTION.

   a. CLEAN AIR ACT. The Contractor shall comply with all applicable standards, orders, or requirements issued under Sections 114 and 306 of the Clean Air Act [42 U.S.C 18579(h)]. [Contracts, subcontracts, and subgrants of amounts in excess of $100,000.]

   b. CLEAN WATER ACT. The Contractor shall comply with all applicable standards, orders, or requirements issued under section 508 of the Clean Water Act [33 U.S.C. 1368], Executive Order 11738, Environmental Protection Agency regulations [40 CFR Part 15], and section 308 of the Federal Water Pollution Control Act (33U.S.C. 1318), that relate generally to inspection, monitoring, entry reports, and information, and with all regulations and guidelines issued thereunder. [Contracts, subcontracts, and subgrants of amounts in excess of $100,000.]

   c. RELATED ENVIRONMENTAL LAWS. The Contractor shall comply with all applicable standards, orders, or requirements issued under the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation and Liabilities Act (CERCLA); the National Environmental Policy Act (NEPA); and any applicable Federal, Contractor or Local environmental regulation.

   d. VIOLATING FACILITIES. The Contractor shall insure that no facility used in his/her performance under this contract is listed on the Environmental Protection

Agency (EPA) list of violating facilities pursuant to 40 CFR Part 15 without the concurrence of state. The Contractor/Vendor shall notify State of the receipt of any communication from EPA indicating that a facility to be or being used in his/her performance under this contract is under consideration for listing on the EPA list of violating facilities.

7. ENERGY POLICY AND CONSERVATION ACT. The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act [Pub Law 94-163].

8. NONDISCRIMINATION. The Contractor shall ensure that no person is denied benefits of, or otherwise be subjected to discrimination in connection with the Contractor's performance under this agreement, on the ground of race, religion, color, national origin, sex and handicap. Accordingly, and to the extent applicable, the Contractor/Vendor covenants and agrees to the comply with the following:

   a. Title VII or the Civil Rights Act of 1964 (42 U.S.C, Art 2000d et seq.), and DOD Regulations (32 CFR Part 300) issued thereunder;

   b. Executive Order 11246 and Department of Labor regulations issued thereunder (41 CFR Part 60);

   c. Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. Art 794) and DOD Regulations issued thereunder (32 CFR Part 56); and,

   d. The Age Discrimination Act of 1975 (42 U.S.C. Art 61601 et seq.) and regulations issued thereunder (45 CFR Part 90).

9. LOBBYING.

   a. The Contractor will not expend any funds appropriated by Congress to pay any person for influencing or attempting to influence an officer or employee of any agency, or a Member of Congress in connection with any of the following covered federal actions; the awarding of any Federal contract; the making of any federal grant; the making of any federal loan; the entering into any cooperative agreement; and, the extension , continuation , renewal, amendment, or modification of any Federal contract, grant loan, or cooperative agreement.

   b. The Interim Final Rule, New Restrictions on Lobbying, issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 28) to implement the provisions of section 319 of Public Law 101-121 (31 U.S.C., Art 1352) is incorporated by reference.

10. DRUG FREE WORK PLACE.

a. The Contractor will comply with the provisions of the drug-free Work Place Act of 1988 (Public Law 100-690, title V, subtitle D; 41 U.S.C. 701 et seq.) and maintain a drug-free workplace.

b. The Final Rule, Government-wide Requirements for Drug-Free Workplace (Grants), issued by the Office of Management and budget and the department of Defense (32 CFR Part 28, Subpart f) to implement the provisions of the Drug-Free Work Place Act of 1988 is incorporated by reference and the Contractor/Vendor covenants and agrees to comply with all the provisions thereof, including any amendments to the Final Rule that may hereafter be issued.

11. USE OF UNITED STATES FLAG VESSELS.

a. To use privately-owned United States flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) of any equipment, materials, or commodities that are both (1) procured, contracted for, or otherwise obtained with funds made available by State under this contract, and (2) transported by ocean vessel, to the extent such vessels are available at fair and reasonable rates;

b. To furnish within 20 working days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, "on-board" commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (a) above to both State and to the division of National Cargo, Office of Market Development, U.S. Maritime Administration, Washington, D.C. 20590; and,

c. Subject to existing contracts, to insert the substance of the provisions of this section in all contracts issued pursuant to this to contract, and to cause such provisions to be inserted in all subcontracts issued pursuant to this contract, where the contract or subcontract is for $100,000 or more and where there is a possibility of ocean transportation of procured equipment or materials.

12. DEBARMENT AND SUSPENSION.

a. The Contractor shall not make any award or permit any award (subgrant or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549, "Debarment and Suspension".

b. The Final Rule, Government wide Debarment and Suspension (Nonprocurement), issued by the office of management and budget and the Department of Defense (32 CFR Part 25) to implement the provisions of executive order 12549, "Debarment and Suspension" is incorporated by reference and the contractor/vendor covenants and agrees to comply with all the provisions thereof, including any amendments to the final rule that may hereafter be issued.

13. BUY AMERICAN ACT. The Contractor will not expend any funds appropriated by Congress without complying with The Buy American Act (41 U.S.C. 10). The Buy American Act gives preference to domestic end products and domestic construction material. In addition, the Memorandum of Understanding between the United States of America and the European Economic Community on Government Procurement, and the North American Free Trade Agreement (NAFTA), provide that EC and NAFTA end products and Construction materials are exempted from application of the Buy American Act.

14. UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES. The Contractor/Vendor covenants and agrees that he/she will comply with the provisions of the uniform relocation assistance and real property acquisition policies act of 1970 (42 U.S.C. 4601 et seq.) and regulations issued thereunder (49 CFR Part 24).

END OF SECTION

STATE OF MAINE

IN THE YEAR OF OUR LORD
NINETEEN HUNDRED AND EIGHTY-FIVE

S.P. 185 – L.D. 503

AN ACT to Require the State to Comply with Municipal Ordinances Governing the Construction of Buildings

Be it enacted by the People of the State of Maine as follows:

5 MRSA 1742-B is enacted to read:

§ 1742-B Municipal Building Ordinance

If a municipality intends to review and issue building permits on state construction projects and public improvements, the municipality must file a notice of intent with the Department of Administration, Bureau of Public Improvements. Once the required notice is filed, the projects and improvements to state-owned or leased buildings must comply with municipal ordinances governing the construction and alteration of buildings, provided that the municipal building code standards are as stringent as, or more stringent than, the code for state buildings. Prior to requesting bids, the bureau shall obtain or it shall require the project designer to obtain municipal approval of the project plans and specifications. Contractors and subcontractors shall obtain all necessary municipal building permits and the project must be subject to municipal inspections.

Fees may be assessed for any permit obtained for any state construction project or public improvements to state-owned buildings.

JAN 14 2002

State of Maine
Department of Labor
Bureau of Labor Standards
Technical Services Division
Augusta, Maine 04333-0045
Telephone (207) 624-6445

Wage Determination - In accordance with 26 MRSA §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid laborers and workers employed on the below titled project.

Title of Project ------ Structural Upgrade and Replace Roofing System for Drill Hall Area, Stevens Ave. Armory

Location of Project -- Portland, Maine in Cumberland County

2003 Fair Minimum Wage Rates
Building 2 Cumberland County
(other than 1 or 2 family homes)

Occupation Title	Median Wage	Median Benefit	Total	Occupation Title	Median Wage	Median Benefit	Total
Asbestos Abatement Wrkr	$13.00	$1.61	$14.61	Insulation Installer	$13.50	$1.86	$15.36
Assembler - Metal Bldg	$11.15	$2.10	$13.25	Ironworker - Reinforcing	$11.00	$0.35	$11.35
Backhoe Loader Operator	$13.90	$1.47	$15.37	Ironworker - Structural	$18.04	$2.69	$20.73
Boilermaker	$17.00	$4.16	$21.16	Laborers/Helper/Tender	$10.70	$0.45	$11.15
Bricklayer	$19.00	$0.00	$19.00	Laborer - Skilled	$12.50	$1.70	$14.20
Bulldozer Operator	$13.00	$1.21	$14.21	Loader Op, Front-End	$12.00	$0.75	$12.75
Carpenter	$16.00	$2.03	$18.03	Mechanic - Maintenance	$15.81	$2.87	$18.68
Carpenter - Acoustical	$15.72	$2.75	$18.47	Mechanic - Refrigeration	$17.88	$2.50	$20.38
Carpenter - Rough	$12.50	$0.56	$13.06	Millwright	$17.50	$2.37	$19.87
Cement Mason/Finisher	$13.50	$0.89	$14.39	Oil Burner Serv & Instr	$19.50	$3.50	$23.00
Commun Equip Installer	$13.50	$3.12	$16.62	Painter	$11.60	$0.62	$12.22
Concrete Pump Operator	$17.00	$0.00	$17.00	Paperhanger	$12.00	$0.00	$12.00
Crane Operator <15 Tons	$14.97	$1.75	$16.72	Pipe/Stm/Sprkler Fitter	$18.00	$4.25	$22.25
Dry-Wall Applicator	$17.00	$0.00	$17.00	Plumber (Licensed)	$16.38	$1.64	$18.02
Dry-Wall Taper & Finisher	$18.00	$0.00	$18.00	Plumber Trainee	$13.00	$1.74	$14.74
Electrician	$19.00	$4.82	$23.82	Roofer	$12.90	$1.56	$14.46
Electrician Hlpr (Licensed)	$12.00	$2.32	$14.32	Sheet Metal Worker	$15.00	$2.69	$17.69
Elevator Constructor	$24.97	$10.69	$35.66	Sider	$10.50	$0.00	$10.50
Excavator Operator	$16.54	$3.42	$19.96	Truck Driver - Heavy	$12.60	$2.69	$15.29
Floor Layer	$14.00	$1.75	$15.75	Truck Driver, Tractor Trlr	$12.75	$2.26	$15.01
Glazier	$14.59	$2.76	$17.35	Truck Driver, Mixer, Cemnt	$9.00	$0.00	$9.00

If any specific occupation is not listed in this determination, there has been no fair minimum wage determined by the Bureau of Labor Standards and there will be none in effect for this project.

Welders are classified in the trade to which the welding is incidental.

Apprentices - The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at $10,000 or more and any subcontractors to such a contractor.

Appeal - Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates with the Secretary of State.

Determination No: B2-006-2003

Filing Date: January 6, 2003

Expiration Date: 12-31-2003

A true copy Michael V. Frett

Attest: _____
Michael V. Frett
Director
Bureau of Labor Standards

BLS 424BU (R2002) (Building 2 Cumberland)

SECTION 01005 - ADMINISTRATIVE PROVISIONS

PART 1 GENERAL

1.01 CONTRACT REQUIREMENTS

A. Scope of Work

1. The Work of the Contract involves new roofing system for drill hall area. Remove existing roof drains, surfacing materials, including asbestos and wood decking. Structural modifications to the existing roof truss system including lead abatement. Install new metal decking, roof insulation, roof drains new rain water piping and E.P.D.M. roofing system, and miscellaneous mechanical and electrical removal and reinstallation, in accordance with Plans and Specification.

2. This project includes the removal of roofing materials that contain asbestos. The roofing contractor may sub-contract the removal of the asbestos containing roofing material (ACRM) to an asbestos abatement contractor or use his own trained personnel. A copy of the work plan must be maintained on file at the job site. All asbestos removal shall be in accordance with Section 13280 of this manual.

3. Disposal of all ACRM to comply with current EPA regulations. The Contractor shall submit to the Owner the original dumping receipts acknowledging proper disposal of ACRM.
4. This project includes the removal of lead coatings. All lead removal shall be in accordance with Section 13280 of this manual.
5. Disposal of all lead waste to comply with current EPA regulations. The Contractor shall submit to the Owner the original dumping receipts acknowledging proper disposal of all lead waste.

B. Contract Method

1. Basis of award of this Contract will be in accordance with Section 1 Instructions to Bidder, Paragraph 2.
2. Contract type: State of Maine – Section 2-E, Short Form Contract Agreement.
3. The project will be constructed under a single lump sum contract.

C. Work Sequence

1. Work of the Contract and related provisions are as described in the Contract Documents
2. Accelerated schedules will not be acceptable to the owner. The Owner has established a date for substantial completion based on availability of the Owner and the Engineer, as well as ongoing facility functions to meet their project responsibility.
3. The contract documents shall not be considered to be without error, inconsistency or omission. Include a reasonable time contingency in the planning of the project to allow for the clarification and instructions that arise out of the limitations of the contract documents.

D. Contractor Use of Premises

1. Work of this Contract includes:
   a. Coordinating the work with the daily operations of the Owner.
   b. Maintaining existing roofs in a weathertight condition, until the Project is complete.

2. Limited use of premises for Work and construction operations only, to allow for Owner occupancy, work by other Contractors, and public access.

3. Limit access of site to Owner's hours of operations, 7:00 A.M. - 4:00 P.M. If Contractor would like to work on a federal or state holiday he/she must request permission from Owner three working days in advance.
4. The Contractor shall be responsible for security on the Contract Site area until substantial completion.

E. Owner Occupancy

1. Owner will occupy premise during entire period of construction, for the conduct of his normal operations. The Contractor shall cooperate with Owner to minimize conflict with and to facilitate Owner's operations.

F. Owner-furnished Products: Not Used

G. Schedule of Allowances: Not Used

H. Additive Alternate: Not Used

I. Unit Prices: Not Used

J. Applications for Payment:

1. Submit six (6) copies of each application under procedures of Section 3-A Article 24, on "Requisition for Payment", Form B.P.I. 17-A-61, revised 4/30/71.

K. Coordination:

1. Work of this Contract includes coordination of the entire Work of the Project.

2. The contractor shall be responsible to obtain all necessary building permits.

3. Coordinate work with all utilities. Interruption of services shall be coordinated with an appropriate official at the facility to minimize the disruption of operations within the facility.

4. Notify an appropriate official at the facility at least three days in advance of the need to move furnishings, equipment, materials, etc. from areas to be affected by the construction. Facility staff will be responsible for moving furnishings that interfere with the Construction or that are particularly sensitive to dust and debris.

5. Control on-site activities to minimize the disruption of the occupants.

6. Coordinate the work of equipment and material suppliers and subcontractors.

7. Make arrangements for the timely delivery of materials and supplies to the job site and for their temporary storage on site.

8. Maintain the project site in a neat condition.

9. Assist the Owner as required in the review of construction.

10. Maintain up to date progress records and as-built drawings.

L. CONFLICTS

1. Contractor shall notify Owner in writing of any real or apparent conflicts in the Contract Documents and, except in cases of emergency, await Owner's determination before proceeding.

2. Conflicts that arise during construction shall be resolved by the Owner.

3. If two or more solutions are indicated in the Contract Documents, the Contractor shall assume the cost of the more expensive solution unless otherwise directed by the Owner.

M. Field Engineering

1. The Contractor shall be responsible for all field engineering as required.

N. Reference Standards

1. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

2. The date of the standard is that in effect as of the Bid date, or date of Owner-Contractor Agreement when there are no bids, except when a specific date is given.

3. Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work.

1.02 SCHEDULING AND PHASING OF WORK

A. Substantial Completion: Work of the Contract must be Substantially Completed by 31 June 2003 so that the Owner can have full use of interior spaces. Final completion of all Work shall be completed by 20 July 2003.

1. Except as otherwise specified, Substantial Completion is hereby defined to mean a stage of completion sufficient for the Owner to have full beneficial use and occupancy of the structure involved, less only minor corrections and repairs that can be performed without undue annoyance to building occupants which shall be documented on the "punch list" as specified hereinafter. Beneficial use and occupancy means removal of all debris, interior and exterior scaffolding, surplus equipment and material and cleaning as required under the Contract completed.

2. Normal building operations will continue throughout the length of the Project. The successful Contractor shall develop a schedule of work that is respectful of the Owner's needs but with a mutual understanding that temporary relocation of personnel within the building will be required.

3. Within ten (10) working days following issuance of a Letter to Proceed, and notwithstanding any delay in execution of a formal Contract Agreement, the Contractor shall prepare a

proposed Phasing and Progress Schedule. The final Schedule shall be as mutually agreed to by the Owner and Contractor, and within the following guidelines:

4. The Owner's business operations must continue throughout the entire construction period.

5. Work within the building interior must comply with the Owner's requirements for continued use and occupancy.

6. Applicable egress codes must be complied with during the construction period. In particular, building entrances and exit ways must be kept open at all times.

1.03 REGULATORY REQUIREMENTS

A. Conform to all Local, State and Federal building codes.

1.04 PROJECT MEETINGS

A. Requirements:

1. Contractor shall, upon acceptance of a Contract and before commencing Work, contact the Owner and request a pre-construction conference as required in Section 3-A, Article 2.

B. Pre-construction Conference

1. The OWNER will administer pre-construction conference for execution of Owner-Contractor Agreement and exchange of preliminary submittals.

C. Progress Meetings

1. The Engineer shall administer Monthly requisition meeting and shall record minutes and distribute copies to all participants.

2. The Contractor shall Schedule and administer minimum weekly Project meetings throughout progress of the Work; called meetings, and pre-installation conferences.

3. Make physical arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within two days to OWNER, participants, and those affected by decisions made at meetings.

4. Attendance: Job superintendent, major Subcontractors and suppliers, Owner and those appropriate to agenda topics for each meeting.

5. Suggested Agenda: Review of Work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of Work.

D. Pre-painting Conferences - Not Used

E. Pre-paving Conferences - Not Used

1.05 SUBMITTALS

A. Procedures

1. In all submittals always refer to project number AP03-063C.

2. Deliver six (6) copies of submittals to Owner for approval at address listed on cover of Project Manual ATTN: OWNER.

3. Transmit each item under OWNER-accepted form. Identify Project, Contractor, Subcontractor, major supplier; identify pertinent drawing sheet and detail number, and Specification Section number, as appropriate. Identify deviations from Contract Documents. Provide space for Contractor and OWNER review stamps.

4. Submit initial Progress Schedules and Contract Schedule Of Values in duplicate within 10 days after date of Owner - Contractor Agreement. After review by OWNER revise and resubmit as required. Submit revised schedules with each Application for Payment, reflecting changes since previous submittal.

5. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.

6. After OWNER review of submittal, revise and resubmit as required identifying changes made since previous submittal.

7. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

B. Quality Assurance; Substitutions

C. Construction Progress Schedule

1. Within ten (10) working days following issuance of a Notice to Proceed, the Contractor shall submit six (6) copies of the Construction Progress Schedule.

2. Show submittal dates required for Shop Drawings, Product Data, and Samples, and product delivery dates, including those furnished by Owner and those under Allowances as applicable.

D. Schedule Of Values

1. Submit typed schedule on "Requisition for Payment", B.P.I. Form 17-A-61, revised 4/30/71.

2 Format: Table of Contents of this Project Manual.

3. Include in each line item a directly proportional amount of Contractor's overhead and profit.

4. Revise schedule to list change orders, for each application for payment.

E. Shop Drawings

1. Shop drawings will be submitted to Owner, in accordance with para. 1.05 of this Section.

F. Product Data

1. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers' standard data to provide information unique to the Work.

2. Submit the number of copies, which Contractor requires, plus two copies, which will be retained by OWNER.

G. Manufacturers Instructions

1. Submit two copies each, of Manufacturer's Instructions.

H. Samples - Not Used

I. Field Samples - Not Used

1.06 QUALITY CONTROL

A. Quality Control, General

1. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Workmanship

1. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

2. Perform work by persons qualified to produce workmanship of specified quality.

3. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

C. Manufacturers' Instructions

1. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Owner before proceeding.

D. Manufacturers' Certificates

1. When required by individual Specifications Section, submit manufacturer's certificate, in duplicate, those products that meet or exceed specified requirements.

1.07 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

A. Electricity

1. The Contractor shall be allowed to hook to existing electrical panel in building, for temporary power. The Contractor will not disrupt power at building. The Owner will pay for cost of electricity.

2. The Contractor shall provide all temporary electrical panels.

3. The Contractor will be responsible to fix any damages, modifications for temporary services.

B. Lighting

1. The Contractor shall provide source of lighting.

C. Heat, Ventilation

1. The Contractor shall provide source of heating.

D. Water

1. The Contractor shall be allowed to hook to existing water in building, for temporary water supply. The Owner will pay for cost of water usage.

E. Sanitary Facilities

1. The Contractor shall provide their Sanitary Facilities.

F. Barriers

1. Provide as required to prevent public entry to construction areas, to provide for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations.

G. The Contractor will provide:

1. Office: Weather tight, with lighting, electrical receptacles, heating, cooling and drawing display table.

2. Storage Sheds for Tools, Materials, and Equipment: Weather tight, with adequate space for organized storage and access, and lighting for inspection of stored materials.

3. His own on-site telephone if so required for the conduct of his business.

4. Protected storage, if necessary.

5. Temporary barricades to separate the Contract Site areas from the public.

H. Protection And Restoration

1. The Contractor shall be responsible for all damages to furnishings, equipment, supplies, existing construction, including finished surfaces, caused by Work of Contract.

2. The Contractor shall be fully responsible for maintaining weather-tight integrity of the roofing system and wall systems, including permanent and temporary flashings, during the entire construction period.

3. The Contractor's responsibilities shall include the cost to repair damage to the existing building's structure, finishes and contents associated with the Contractor's failure to maintain the watertight integrity of the roofing system and wall system, whether permanent or temporary, at no additional cost to the Owner.

4. The Contractor shall protect paved areas and lawns around the Building from damage associated with the construction. Costs to repair major damage to paved areas and lawns will be deducted from Contractor's final payment to cover Owner's expenses to repair damage. The Owner will determine if damages to lawns are minor or major.

5. Dust control:
   a. The contractor must provide an acceptable plan for preventing the generation of dust due to operations in the construction zones, along haul routes, in equipment parking areas, in waste areas and in owner occupied areas. Provide labor, material, and equipment required to construct dust-proof barriers to isolate dust and dirt from construction operations; make provisions to keep dust from penetrating into mechanical systems and tape door and window openings and cracks to form a complete dust barrier; use negative air exhaust fans to provide negative air pressure in dusty work areas; and equipment fans with filters capable of preventing visible dust release at exhaust duct. Remove all barriers upon completion of the work and clean the work area; and clean to the original state any areas beyond the work area that become dust-laden as a result of the work operation.

6. GYM FLOOR PROTECTION:
   a. Provide 6 mil polyethylene sheets laid continuously over entire gym floor area with taped seams. Remove once work above is completed. Wrap up all walls and seal.

   b. Provide ½" plywood sheathing over 6 mil polyethylene sheets around all areas of structural modification.

I. Security

1. Provide security program and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, and theft. Coordinate with Owner's security program.

J. Water Control - Not Used

K. Cleaning during Construction

1. Throughout the construction period the Contractor shall be responsible for maintaining building and site areas affected by the Work in a standard of cleanliness.

   a. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing protection of materials.

   b. Completely remove all scrap, debris, waste material and other items not required for construction from the site at least once a week.

   c. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

2. Conduct daily inspection, more often if necessary, to verify that requirements for cleanliness are being satisfied.

3. Provide required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

4. Use only those cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

L. Removal

1. Materials to be removed, including all components and accessories, become property of the Contractor and shall be promptly removed from the Contract Site and legally disposed of at Contractor's expense.

2. Remove all debris, rubbish, surplus materials and equipment immediately from the Project Site and legally dispose of at Contractor's expense.

3. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.

4. Clean and repair damage caused by installation or use of temporary facilities. Restore existing facilities used during construction to specified, or to original, condition.

5. Do not assume that local landfill facilities will accept construction debris, even if paid for.

1.08 MATERIAL AND EQUIPMENT

A. Products

1. Products include material, equipment, and systems.

2. Comply with Specifications and referenced standards as minimum requirements.

3. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.

4. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by Contract Documents.

5. ACBM (ASBESTOS CONTAINING BUILDING MAT'LS) NOT ALLOWED, materials containing asbestos in any manner or quantity are not allowed on this Project. If such materials are installed they shall be removed and replaced at no additional cost to the Owner.

B. Transportation and Handling

1. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.

2. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

3. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

C. Storage and Protection

1. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

2. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.

3. Products Specified by Reference Standards or by Description Only: Any product meeting those standards.

4. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named.

E. Products List

1. Within 15 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

F. Substitutions

1. Substitutions shall be submitted a minimum of 72 hours prior to bid date, any substitutions not submitted 72 hours prior to bid date shall not be permitted.

2. Do not assume that "or Equal" or terms of similar meaning indicate automatic approval of substitute products.

3. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

4. Request constitutes a representation that the Contractor:

a. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.

b. Will provide the same warranty for substitution as for specified product.

c. Waives claims for additional costs, which may subsequently become apparent.

5. OWNER will determine acceptability of proposed substitution, and will notify the Contractor of acceptance or rejection in writing within a reasonable time.

G. Systems Demonstration Not Used

1.09 CONTRACT CLOSEOUT

A. Closeout Procedures

1. When Contractor considers Work has reached final completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for OWNER's inspection.

2. In addition to submittals required by the conditions of the Contract, provide release of all liens and submit final requisition.

B. Final Cleaning

1. Execute prior to final inspection.

2. Clean site; sweep hard surfaced areas, rake clean other surfaces.

3. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site. Owner will be responsible for cleaning after acceptance.

C. Project Record Documents

1. Store documents separate from those used for construction.

2. Keep documents current; do not permanently conceal any work until Owner has inspected and required information has been recorded.

3. At Contract closeout, submit documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.

D. Warranties and Bonds

1. Provide duplicate, notarized copies. Execute Contractor's submittals and assemble documents executed by Subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.

2. Submit material prior to final application for payment. For equipment put into use with Owner's permission during construction, submit within 10 days after first operation. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

E. Spare Parts and Maintenance Materials - Not Used

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used
END OF SECTION 01005

SECTION 01560 - ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.01 DEFINITIONS OF CONTAMINANTS:

A. Sediment: Soil and other debris that has been eroded and transported by runoff water.

B. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations, and from community activities.

C. Rubbish: A variety of combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal, lumber, cans and bones.

D. Debris: Includes combustible and noncombustible wastes such as ashes, waste materials that result from construction or maintenance and repair work, leaves, and tree trimmings.

E. Chemical Wastes: Includes salts, acids, alkalies, herbicides, pesticides, and organic chemicals.

F. Sanitary Wastes: See Section 01005, para. 107.E.1.

G. Sewage: Wastes characterized as domestic sanitary sewage.

H. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

I. Oily Waste: Includes petroleum products and bituminous materials.

1.02 ENVIRONMENTAL PROTECTION REQUIREMENTS:

A. General:

1. Provide and maintain during the life of the contract, environmental protection as defined herein. Provide environmental protective measures as required to control pollution that develops during normal construction practice. Provide also environmental protection measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with all federal, state, and local regulations pertaining to water, air, and noise pollution.

PART 2 - PRODUCTS: NOT USED

PART 3 - EXECUTION

3.01 PROTECTION OF NATURAL RESOURCES:

A. General:

1. The natural resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their existing condition or restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the work schedule, drawings, and specifications.

B. Land Resources:

1. Except in areas indicated to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without special approval of the Owner. Do not fasten or attach ropes, cables, or guys to any existing nearby trees for anchorages unless specifically authorized. Where such special emergency use is authorized, the Contractor shall be responsible for any resultant damage.

C. Protection:

1. Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operators. Remove displaced rocks from uncleared areas. Protect monuments, markers and works of art.

D. Repair and Restoration:

1. Repair or restore to their original condition all trees or other landscape features scarred or damaged by the equipment operations. Obtain approval of the repair or restoration from the Owner prior to its initiation.

E. Temporary Construction:

1. Obliterate all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and all other vestiges of construction. Temporary roads, parking areas, and similar temporary use areas shall be graded in conformance with surrounding areas, tilled, and seeded. Include topsoil or nutriment during the seeding operation as necessary to establish a suitable stand of grass.

F. Water Resources:

1. Perform all work in such a manner that any adverse environmental impact on water resources is reduced to a level acceptable to the Owner.

G. Oil Substances:

1. Take special measures to prevent oily or hazardous substances from entering the ground, drainage areas or local bodies of water. Surround all temporary fuel oil, petroleum, or liquid chemical storage tanks with a temporary berm of sufficient size and strength to contain the contents of the tanks in the event of content leakage or spillage.

H. Fish and Wildlife Resources:

1. During the performance of the work take such steps as required to prevent interference or disturbance to fish and wildlife. Do not alter water flows or otherwise significantly disturb native habitat adjacent to the project area which are critical to fish and wildlife except as may be indicated or specified.

I. Historical and Archaeological Resources:

1. Carefully preserve and report immediately to the Owner all items having any apparent historical or archaeological interest which are discovered in the course of any construction activities.

3.02 EROSION AND SEDIMENT CONTROL MEASURES:

A. Burn-off:

1. Burn-off of ground cover is not permitted.

B. Protection of Erodible Soils:

1. All earthwork brought to final grade shall be immediately finished as indicated or specified. Protect immediately side slopes and backslopes upon completion of rough grading. Plan and conduct all earthwork in such a manner as to minimize the duration of exposure of unprotected soils.

C. Temporary Protection to Erodible Soils:

1. Utilize the following methods to prevent erosion and control sedimentation.

D. Mechanical Retardation and Control of Runoff:

1. Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, and berms, to retard and divert runoff to protected drainage courses.

E. Vegetation and Mulch:

1. Provide temporary protection on all side and back slopes as soon as rough grading is completed or sufficient soil is exposed to require protection to prevent erosion. Such protection shall be by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such contamination of these and other methods necessary for effective erosion control.

3.03 CONTROL AND DISPOSAL OF SOLID, CHEMICAL AND SANITARY WASTES:

A. General:

1. Pick up solid wastes and place in containers which are emptied on a regular schedule. The preparation, cooking, and disposing of food are strictly prohibited on the project site. Conduct handling and disposal of wastes to prevent contamination of the site and other areas. On completion, leave areas clean and natural looking. Obliterate signs of temporary construction and activities incidental to construction of permanent work in place.

B. Disposal of Rubbish, Garbage, and Debris:

1. Dispose of rubbish, garbage and debris in accordance with the requirements specified herein.

C. Sewage, Odor, and Pest Control:

1. Dispose of sewage through connection to the installation sanitary sewage system. Where such a system is not available, use chemical toilets or comparable effective units and periodically empty wastes into the installation sanitary sewerage system. Include provisions for pest control and elimination of odors.

D. Chemical Wastes:

1. Store chemical waste in corrosion resistant containers labeled to identify type of waste and date filled. Remove containers from the project site, and dispose of chemical waste in accordance with federal, state, and local regulations. For oil and hazardous material spills which may be large enough to violate federal, state, or local regulations, notify the MeARNG Environmental Specialist immediately - Telephone (207) 626-4395.

E. Petroleum Products:

1. Conduct fueling and lubricating of equipment and motor vehicles in a manner that affords the maximum protection against spills and evaporation. Dispose of lubricants to be discarded and excess oil in accordance with approved procedures meeting federal, state and local regulations.

3.04 DUST CONTROL:

A. General:

1. Keep dust down at all times, including nonworking hours, weekends, and holidays. Sprinkle or treat with dust suppressors, the soil at the site, haul roads, and other areas disturbed by operations. Petroleum products will not be used as suppressors. No dry power brooming is permitted. Instead use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing is permitted only for cleaning of non-particulate debris, such as steel reinforcing bars. No unnecessary shaking of bags is permitted where bagged cement, concrete mortar and plaster is used.

3.05 NOISE:

A. General:

1. When available, make the maximum use "low-noise-emission products" as certified by EPA. No blasting or use of explosives is permitted without written permission of the Contracting Officer and then only during designated times.

END OF SECTION 01560

SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Demolition and removal of selected portions of a building.
2. Patching and repairs.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Summary" for use of the building and phasing requirements.
2. Division 1 Section "Cutting and Patching" for cutting and patching procedures for selective demolition operations.
3. Division 1 Section "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures for selective demolition operations.
4. Division 1 Section "Closeout Procedures" for record document requirements.
5. Division 6 Section "Rough Carpentry" for material and construction requirements for temporary enclosures.
6. Division 9 Section "Gypsum Board Assemblies" for material and construction requirements for temporary enclosures.
7. Division 13 Section "Hazardous Material remediation" for asbestos and lead abatement.
8. Division 15 Sections for cutting, patching, or relocating mechanical items.
9. Division 16 Sections for cutting, patching, or relocating electrical items.

1.2 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.

B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.

C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.

D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Engineer, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.3 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

B. Proposed dust-control measures.

C. Proposed noise-control measures.

D. Schedule of selective demolition activities indicating the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
2. Interruption of utility services.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Detailed sequence of selective demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
7. Locations of temporary partitions and means of egress.

E. Inventory of items to be removed and salvaged.

F. Inventory of items to be removed by Owner.

G. Record drawings at Project closeout according to Division 1 Section "Closeout Procedures."

1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Predemolition Conference: Conduct conference at Project site to comply with preinstallation conference requirements of Division 1 Section "Project Management and Coordination."

1.6 PROJECT CONDITIONS

A. Owner will occupy portions of the building immediately adjacent to selective demolition area. Conduct selective demolition so that Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Owner assumes no responsibility for actual condition of buildings to be selectively demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
2. Asbestos: It is expected that asbestos will be encountered in the Work. Refer to Division 13 of the specifications and demolition drawings for requirements of this contract.

3. Lead coatings: Lead coating will be encountered in the work. Coordinate the lay out of areas requiring lead coating removal to facilitate the demolition and or modifications to existing steel structures. Refer to Division 13 of the specifications and demolition drawings for requirements of this contract

C. Storage or sale of removed items or materials on-site will not be permitted.

1.7 SCHEDULING

A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

1.8 WARRANTY

A. Existing Special Warranty: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Engineer.

E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to governing authorities.

a. Provide not less than 72 hours' notice to Owner if shutdown of service is required during changeover.

B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving building to be selectively demolished.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. Where utility services are required to be removed, relocated, or abandoned, provide by-pass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

C. Utility Requirements: Refer to Division 15 and 16 Sections for shutting off, disconnecting, removing, and sealing or capping utility services. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PREPARATION

A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

B. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces and new construction to ensure that no water leakage or damage occurs to structure or interior areas.
5. Protect walls, ceilings, floors, and other existing finish work that are to remain and are exposed during selective demolition operations.
6. Cover and protect furniture, furnishings, and equipment that have not been removed.

D. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

1. Construct dustproof partitions of not less than nominal 4-inch (100-mm) studs, 5/8-inch (16-mm) gypsum wallboard with joints taped on occupied side, and 1/2-inch (13-mm) fire-retardant plywood on the demolition side.
2. Insulate partition to provide noise protection to occupied areas.
3. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.

4. Protect air-handling equipment.
5. Weatherstrip openings.

E. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to be selectively demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 POLLUTION CONTROLS

A. Use water mist, temporary enclosures, negative air machines, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.5 SELECTIVE DEMOLITION

A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition work above each floor or tier before disturbing supporting members on lower levels.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

9. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
10. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.

C. Break up and remove concrete slabs on grade, unless otherwise shown to remain.

D. Remove no more existing roofing than can be covered in one day by new roofing. See applicable Division 7 Section for new roofing requirements.

E. Remove air-conditioning equipment without releasing refrigerants.

3.6 PATCHING AND REPAIRS

A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

B. Patching is specified in Division 1 Section "Cutting and Patching."

C. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

1. Completely fill holes and depressions in existing masonry walls to remain with an approved masonry patching material, applied according to manufacturer's printed recommendations.

D. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.

E. Patch and repair floor and wall surfaces in the new space where demolished walls or partitions extend one finished area into another. Provide a flush and even surface of uniform color and appearance.

1. Closely match texture and finish of existing adjacent surface.
2. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
3. Where patching smooth painted surfaces, extend final paint coat over entire unbroken surface containing the patch after the surface has received primer and second coat.
4. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
5. Inspect and test patched areas to demonstrate integrity of the installation, where feasible.

F. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

D. Enter into a contract for the transportation and disposal of all solid waste in accordance with the applicable State, Local and Federal regulations.

3.8 CLEANING

A. Sweep the building broom clean on completion of selective demolition operation.

B. Change filters on air-handling equipment on completion of selective demolition operations.

END OF SECTION 02070

SECTION 04810 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:

1. Concrete masonry units.
2. Face brick.
3. Mortar and grout.
4. Reinforcing steel.
5. Masonry joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Miscellaneous masonry accessories.

B. Related Sections include the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
2. Division 7 Section "Bituminous Dampproofing" for dampproofing applied to cavity face of backup wythes of cavity walls.
3. Division 7 Section "Firestopping" for Firestopping at tops of masonry walls and at openings in masonry walls.

C. Products installed, but not furnished, under this Section include the following:

1. Steel lintels for brick masonry, furnished under Division 5 Section "Metal Fabrications."

1.2 SUBMITTALS

A. Product Data: For each different masonry unit, accessory, and other manufactured product specified.

B. Samples for Selection: For the following:

1. Full-size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
2. Colored mortar Samples for each color required, showing the full range of colors expected in the finished construction.
3. Weep holes/vents in color to match mortar color.
4. Accessories embedded in the masonry.

C. Material Test Reports: From a qualified testing agency indicating and interpreting test results of the following for compliance with requirements indicated:

1. Each type of masonry unit required.

    a. Include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.

D. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Each type of masonry unit required.

    a. Include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.

2. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
3. Each material and grade indicated for reinforcing bars.
4. Each type and size of joint reinforcement.
5. Each type and size of anchor, tie, and metal accessory.

E. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements. Coordinate with General Contractor's procedures for enclosures and heating.

1.3 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated, as documented according to ASTM E 548.

B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

1. Protect Type I concrete masonry units from moisture absorption so that, at the time of installation, the moisture content is not more than the maximum allowed at the time of delivery.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.5 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by coverings spread on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates or setting beds. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with the following requirements:

1. Cold-Weather Construction: When the anticipated daytime low temperature is within the limits indicated, use the following procedures:

a. 40 to 32°F (4 to 0°C): Heat mixing water or sand to produce mortar temperatures between 40 and 120°F (4 and 49°C).
b. 32 to 25° F (0 to -4°C): Heat mixing water and sand to produce mortar temperatures between 40 and 120°F (4 and 49°C). Heat grout materials to produce grout temperatures between 40 and 120° F (4 and 49°C). Maintain mortar and

grout above freezing until used in masonry. Use heat on both sides of walls under construction. Coordinate with General Contractor for heating both sides of walls under construction.

c. 25 to 20°F (-4 to -7°C): Heat mixing water and sand to produce mortar temperatures between 40 and 120°F (4 and 49°C). Heat grout materials to produce grout temperatures between 40 and 120°F (4 and 49°C). Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40°F (4°C) if grouting. Coordinate with General Contractor to provide enclosures and heat both sides of walls under construction to maintain temperatures above 32°F (0°C) within the enclosures.

d. 20°F (-7°C) and Below: Heat mixing water and sand to produce mortar temperatures between 40 and 120°F (4 and 49°C). Heat grout materials to produce grout temperatures between 40 and 120° F (4 and 49°C). Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40°F (4°C). Coordinate with General Contractor to provide enclosures and heat both sides of walls under construction to maintain temperatures above 32°F (0°C) within the enclosures.

2. Cold-Weather Protection: When the anticipated daytime low temperature is within the limits indicated, coordinate with the General Contractor to provide the following protection. This is in addition to construction procedures specified above:

a. 40 to 32°F (4 to 0°C): Cover masonry insulating blankets for 48 hours after construction.

b. 32°F (0°C) and Below: Provide enclosure and heat to maintain temperatures above 32°F (0°C) within the enclosure for 72 hours after construction.

3. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40°F (4°C) and above and will remain so until masonry has dried out, but not less than 7 days after completion of cleaning.

E. Hot-Weather Requirements: Coordinate with the General Contractor to protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.

1. When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with a wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows:

1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners, unless indicated as bullnose.

    a. Provide bullnose at outside corners of door jambs and elsewhere as indicated on the drawings.

B. Concrete Masonry Units: ASTM C 90 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi (13.1 MPa).
2. Weight Classification: Normal weight.
3. Provide Type I, moisture-controlled units.
4. Size (Width): Manufactured to the following dimensions:

    a. 6 inches (152 mm) nominal; 5-5/8 inches (142 mm) actual.

    b. 8 inches (203 mm) nominal; 7-5/8 inches (194 mm) actual.

5. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

2.2 BRICK

A. General: Provide shapes indicated and as follows for each form of brick required:

B. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.

1. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

C. Face Brick: ASTM C 216, Grade SW, Type FBS (extruded), and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 8000 psi (55.2 MPa).
2. Initial Rate of Absorption: Less than 20 g/30 sq. in. (20 g/194 sq. cm) per minute when tested per ASTM C 67.
3. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
4. Surface Coloring: Brick with surface coloring, other than flashed or sand-finished brick, shall withstand 50 cycles of freezing and thawing per ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet (3 m).
5. Size: Manufactured to the following actual dimensions:

    a. Closure Modular (Econo): 3-1/2 to 3-5/8 inches (89 to 92 mm) wide by 3-1/2 to 3-5/8 inches (89 to 92 mm) high by 7-1/2 to 7-5/8 inches (190 to 194 mm) long.

6. Application: Use where brick is exposed, unless otherwise indicated.
7. Products: Subject to compliance with requirements, provide one of the following:

    a. Light Flashed Old Port Blend by Morin Brick Company.
    b. Provide solid modular blocks at window sills.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of Portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.

1. Blue Circle Cement, Inc.: Eaglebond High Strength Type "S".
2. Ciment Quebec, Inc.: Portland and Lime / Type S.

D. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.

E. Aggregate for Grout: ASTM C 404.

F. Water: Potable.

2.4 REINFORCING STEEL

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60 (Grade 400).

2.5 MASONRY JOINT REINFORCEMENT

A. Interior Block Wall Reinforcement: Ladder type, ASTM A641, mill galvanized, No. 9 wire.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

    a. Duro-wall; D/A 320 Ladur.
    b. Hohmann & Barnard; Ladder-Mesh, #220.
    c. Wire-Bond; Series 200, Single Wythe.

B. Exterior Block Wall Reinforcement: Ladder type, ASTM A153 B2, hot dipped galvanized, with 3/16 inch side and cross rods.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. Duro-wall; D/A 320 Ladur.
b. Hohmann & Barnard; Ladder-Mesh, #220.
c. Wire-Bond; Series 200, Single Wythe.

C. Multiple Wythe Joint Reinforcement: Ladder type, ASTM A153 B2, hot dipped galvanized, with 3/16 inch side and cross rods.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. Duro-wall; D/A 360 Ladur-eye.
b. Hohmann & Barnard; Lox-All Adjustable Eye-Wire, #270.
c. Wire-Bond; Series 800, Composite Hook and Eye.

D. Steel: ASTM A615, 60 ksi (414 MPa) yield grade, deformed billet bars, uncoated finish.

E. Strap Anchors: 12 gage bent steel shape, uncoated finish.

2.6 MISCELLANEOUS ANCHORS

A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:

1. Nonheaded bolts, bent in manner indicated, typical unless headed bolts are indicated.
2. Headed bolts, where indicated.

B. Postinstalled Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

1. Type: Expansion anchors.
2. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild), use at interior walls.
3. For Postinstalled Anchors in Concrete: Capability to sustain, without failure, a load equal to four times the loads imposed.
4. For Postinstalled Anchors in Masonry Units: Capability to sustain, without failure, a load equal to six times the loads imposed.

2.7 EMBEDDED FLASHING MATERIALS

A. Masonry Flashing (Fabric Flashing): For base flashing in veneer masonry, and for head flashing at doors and windows, use the following, unless otherwise indicated:

1. Copper-Laminated Flashing: Manufacturer's standard laminated flashing consisting of 5-oz./sq. ft. (1.5-kg/sq. m) sheet copper bonded with asphalt between 2 layers of glass-fiber cloth.

2. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

   a. Copper Fabric; AFCO Products, Inc.
   b. H & B C-Fab Flashing; Hohmann & Barnard, Inc.
   c. Copper Fabric Flashing; Polytite Manufacturing Corp.
   d. Copper Fabric Flashing; Sandell Manufacturing Co., Inc.
   e. York Copper Fabric Flashing; York Manufacturing, Inc.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.

   1. Holmann & Barnard: #NS – Closed Cell Neoprene.
   2. Wire Bond: 3000 Horizontal.

B. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

   1. Styrene-Butadiene-Rubber Compound: ASTM D 2000, Designation M2AA-805.
   2. PVC: ASTM D 2287, Type PVC-65406.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Cavity Vents: Medium-density polyethylene, 3/8-inch (9-mm) OD by 4 inches (100 mm) long.

E. Weep Hole/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, designed to fill head joint with outside face held back 1/8 inch (3 mm) from exterior face of masonry, in color selected from manufacturer's standard.

   1. Available Products: Subject to compliance with requirements, cavity drainage materials that may be incorporated into the Work include, but are not limited to, the following:

      a. Cell Vent; Dur-O-Wal, Inc.
      b. #QV-Quadro-Vent; Hohmann & Barnard.

F. Cavity Drainage Material: 2-inch- (50-mm-) thick, free-draining mesh; made from polyethylene strands and shaped to avoid being clogged by mortar droppings.

   1. Available Products: Subject to compliance with requirements, cavity drainage materials that may be incorporated into the Work include, but are not limited to, the following:

      a. Mortar Net by Mortar Net USA, LTD.; Model MN10-2.
      b. Mortar Maze by Advanced Building Products; Mortar Maze 2".

G. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed

from 0.142-inch (3.6-mm) steel wire, hot-dip galvanized after fabrication. Provide units with either two loops or four loops as needed for number of bars indicated.

1. Available Products: Subject to compliance with requirements, cavity drainage materials that may be incorporated into the Work include, but are not limited to, the following:

   a. D/A 811; Dur-O-Wal, Inc.
   b. D/A 816; Dur-O-Wal, Inc.
   c. No. 376 Rebar Positioner; Heckman Building Products, Inc.
   d. #RB Rebar Positioner; Hohmann & Barnard, Inc.
   e. #RB-Twin Rebar Positioner; Hohmann & Barnard, Inc.
   f. Double O-Ring Rebar Positioner; Masonry Reinforcing Corporation of America.
   g. O-Ring Rebar Positioner; Masonry Reinforcing Corporation of America.

H. Felt Paper: Asphalt-saturated organic felt, ASTM D226.

1. Type 1: No. 30 asphalt felt, unperforated.

2.9 CAVITY-WALL INSULATION

A. Cavity-Wall Insulation: Polyisocyanurate Board Insulation. Aluminum-foil-faced, glass-fiber-reinforced, rigid, cellular, polyisocyanurate thermal insulation complying with ASTM C 1289, Type I, Class 2.

1. Available Products: Subject to compliance with requirements, cavity insulation that may be incorporated into the Work include, but are not limited to, the following:

   a. Celotex

B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.10 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Available Products: Subject to compliance with requirements, products that may be used to clean unit masonry surfaces include, but are not limited to, the following:

   a. 202V Vana-Stop; Diedrich Technologies, Inc.
   b. Sure Klean Vana Trol; ProSoCo, Inc.

2.11 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification.
   1. For reinforced masonry and where indicated, use Type S.
   2. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type S.
   3. For interior non-load-bearing partitions, Type S.

C. Grout for Unit Masonry: Comply with ASTM C 476.

   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
   2. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
   2. Verify that foundations are within tolerances specified.
   3. Verify that reinforcing dowels are properly placed.
   4. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.2 PREPARATION

A. Felt Paper Application: Cover sheathing with felt as follows:

   1. Cut back felt paper 1/2 inch (13 mm) on each side of break in supporting members at expansion- or control-joint locations.
   2. Apply felt paper horizontally with 2-inch (50-mm) overlap and 6-inch (150-mm) end lap; fasten to sheathing with corrosion-resistant staples.
   3. Apply felt paper to comply with manufacturer's written installation instructions.
   4. Apply felt paper to cover vertical flashing with 4-inch (100-mm) overlap.

B. Coordinate with General Contractor for enclosures and heating requirements.

3.3 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

C. Where cutting and patching existing CMU, tooth in new work only where exposed to view.

D. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

F. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

G. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

H. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at the time of laying.

3.4 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.

D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm). Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).

F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).

fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

1. Fill cracks and open gaps greater than 1/4 inch (6 mm) in insulation with foam insulation specified in Division 7 section "Building Insulation".

3.9 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c. unless noted otherwise.
2. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings.

    a. Reinforcement above is in addition to continuous reinforcement.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.10 LINTELS

A. Install steel lintels where indicated.

B. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.

1. Provide built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in-place lintels until cured.
2. Extend horizontal reinforcement beyond the opening a minimum of 40 bar diameters, but not less than 24 inches.
3. Where steel lintels are utilized in concrete masonry openings, construct a bond beam above the steel with 2 #4 bars. Extend 24 inches beyond the opening.

C. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

3.11 FLASHING, WEEP HOLES, AND VENTS

A. General: Install embedded flashing, cavity drainage materials, and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

C. Install masonry flashing as follows:

1. At multiwythe masonry walls, including cavity walls, extend flashing from exterior face of outer wythe of masonry, through outer wythe, turned up a minimum of 8 inches (200 mm), and through inner wythe 1 inch (25 mm). Fold flashing back over itself 1/2 inch (13 mm) to form hem.
2. At masonry-veneer walls, extend flashing from exterior face of veneer, through veneer, up face of sheathing at least 8 inches (200 mm), and behind felt paper.
3. At lintels and shelf angles, extend flashing a minimum of 4 inches (100 mm) into masonry at each end. At heads and sills, extend flashing 4 inches (100 mm) at ends and turn flashing up not less than 2 inches (50 mm) to form a pan.
4. Cut flashing off 3/8 inch (10 mm) beyond face of wall after masonry wall construction is completed and turn flashing down to form a drip.

D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

1. Use plastic weep hole/vents to form weep holes.
2. Space weep holes 24 inches (600 mm) o.c.
3. Place cavity drainage material immediately above flashing in cavities.

E. Install vents in vertical head joints at the top of each continuous cavity. Use round plastic tubing to form vents.

1. Space weep holes 32 inches (900 mm) o.c.

3.12 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make it sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements of ACI 530.1/ASCE 6/TMS 602.

1. Layout vertical reinforcement with specified jamb reinforcement 4" from each corner, control joint, and opening jamb. Space bars between at a uniform spacing that does not exceed the spacing specified, rounded to the nearest 8". Maximum spacing shall not exceed 48" in any location.

2. Minimum splice length for deformed bar reinforcement shall be 48 bar diameters. Secure lap splices by tying with wire.
3. Secure reinforcement in place before placing grout, For vertical reinforcement, use one of the following methods:

    a. Secure bar at the bottom of each grout lift by tying to dowels. Build masonry around reinforcement. Install rebar positioners at the top of each bar and at a maximum spacing of 192 bar diameters.
    b. Install rebar positioner at the bottom course of the grout lift, located within 4 inches of the dowel to be spliced. Lay up masonry units. Set vertical bar in the rebar positioner. Install additional rebar positioners at the top of the bar, and at a maximum spacing of 192 bar diameters.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

1. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Definitions:

    a. Grout Lift - Grout placed in one continuous operation. The maximum time span for the grout placement in one lift is 1-1/2 hours measured from the time water is added to the grout mix. The minimum time span between successive grout lifts is one hour.
    b. Grout Pour - The height of masonry to be grouted prior to the erection of additional masonry.

3. Provide cleanout holes at least 3 inches (76 mm) in least dimension for grout pours over 60 inches (1524 mm) in height.

    a. Provide cleanout holes at each vertical reinforcing bar.

4. Where grouting of cells does not extend the full height of the wall, install specified grout stop at the bottom of lift.
5. Consolidate grout with a mechanical vibrator.

    a. Use a low velocity vibrator with a 3/4 inch head.
    b. Vibrate each cell in concrete masonry units twice. Insert vibrator to bottom of lift and activate for 1 to 2 seconds.
    c. Perform initial consolidation at each cell immediately after grout placement.
    d. Perform reconsolidation in each cell by reinserting vibrator when grout is still plastic.

3.13 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Engineer's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.
6. Clean brick masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
7. Clean brick masonry by the bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20 Revised and the cleaning compound manufacturer's written instructions.

3.14 MASONRY WASTE DISPOSAL

A. Recycling: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Excess Masonry Waste: Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04810

SECTION 04901 - CLAY MASONRY RESTORATION AND CLEANING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Repointing mortar joints.

B. Related Sections include the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
2. Division 4 Section "Unit Masonry Assemblies" for new clay masonry construction.
3. Division 7 Section "Joint Sealants" for sealing joints in restored clay masonry.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with type and name of products and manufacturers.

B. Store cementitious materials off the ground, under cover, and in a dry location.

C. Store aggregates, covered and in a dry location, where grading and other required characteristics can be maintained and contamination avoided.

D. Comply with manufacturer's written instructions for minimum and maximum temperature requirements for storage.

1.3 PROJECT CONDITIONS

A. Do not repoint mortar joints or repair masonry unless air temperature is between and 40 and 80 deg F (4 and 27 deg C) and will remain so for at least 48 hours after completion of Work.

B. Cold-Weather Requirements: Comply with the following procedures for masonry repair and mortar-joint pointing:

1. When air temperature is below 40 deg F (4 deg C), heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F (4 and 49 deg C).
2. When mean daily air temperature is between 25 and 40 deg F (minus 4 and 4 deg C), cover completed Work with weather-resistant, insulating blankets for 48 hours after repair and pointing.
3. When mean daily air temperature is below 25 deg F (minus 4 deg C), provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 48 hours after repair and pointing.

C. Hot-Weather Requirements: Protect restoration work when temperature and humidity conditions produce excessive evaporation of water from mortar and patching materials. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C) and above.

D. Prevent grout or mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Immediately remove grout and mortar in contact with exposed masonry and other surfaces.

E. Protect sills, ledges, and projections from mortar droppings.

PART 2 - PRODUCTS

2.1 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II.

1. Provide white cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: ASTM C 144, unless otherwise indicated.

1. Match size, texture, and gradation of existing mortar as closely as possible.

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

E. Water: Potable.

2.2 CLEANING MATERIALS

A. Water for Cleaning: Potable.

B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Available Products: Subject to compliance with requirements, products that may be used to clean unit masonry surfaces include, but are not limited to, the following:

a. 202V Vana-Stop; Diedrich Technologies, Inc.
b. Sure Klean Vana Trol; ProSoCo, Inc.

2.3 MORTAR MIXES

A. Measurement and Mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 1 to 2 hours. Add remaining water in small portions until reaching mortar of the desired consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

B. Colored Mortar: Produce mortar of color required by using selected ingredients. Do not adjust proportions without Engineer's approval.

1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.

C. Do not use admixtures of any kind in mortar, unless otherwise indicated.

D. Mortar Proportions: Mix mortar materials in the following proportions:

1. Pointing Mortar for Brick: 1 part portland cement, 1 part lime, and 6 parts natural-mortar aggregate.

PART 3 - EXECUTION

3.1 REPOINTING MASONRY

A. Rake out joints as follows:

1. Rake out mortar from joints to depths equal to 2-1/2 times their widths, but not less than 1/2 inch (13 mm) or not less than that required to expose sound, unweathered mortar.
2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
3. Do not spall edges of masonry units or widen joints. Replace damaged masonry units.

a. For bed joints, power-operated grinders will be allowed with Engineer's approval based on mockup by Contractor of a satisfactory ability of operators to use tools without damaging masonry.
b. For head joints, cut out old mortar by hand with a chisel and mallet.

B. Point joints as follows:

1. Rinse masonry-joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at the time of pointing, excess water has evaporated or run off and joint surfaces are damp but free of standing water.
2. Apply the first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch (9 mm)

until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint hard before applying the next layer.

3. After joints have been filled to a uniform depth, place remaining pointing mortar. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar.
4. When mortar is thumbprint hard, tool joints to match original appearance of joints, unless otherwise indicated. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in a damp condition for at least 72 hours.
6. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.2 FINAL CLEANING

A. After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
4. Clean brick masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
5. Clean brick masonry by the bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20 Revised and the cleaning compound manufacturer's written instructions.

END OF SECTION 04901

SECTION 05210 - STEEL JOISTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Open-web K-series steel joists.
2. KCS-type, open-web K-series steel joists.
3. Joist accessories.

B. Related Sections include the following:

1. Division 4 Section "Unit Masonry Assemblies" for installing bearing plates in unit masonry.
2. Division 5 Section "Metal Fabrications" for furnishing steel bearing plates.
3. Division 9 Section "Painting" for prime painting.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide connections capable of withstanding design loads within limits and under conditions indicated.

1. Design Loads: As specified on structural drawings.

B. Design joists to withstand design loads with live load deflections no greater than the following:

1. Roof Joists: Vertical deflection of 1/240 of the span.

1.4 SUBMITTALS

A. Product Data: For each type of joist, accessory, and product indicated.

B. Shop Drawings: Show layout, mark, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, accessories; splice and connection locations and details; and attachments to other construction.

1. Submit a letter of certification from the material fabricator sealed by a professional engineer licensed to practice in the State of Maine attesting that all shop drawings were prepared under his direct supervision.
2. Submit design calculations from the material fabricator sealed by a professional engineer licensed to practice in the State of Maine for all joist types and associated connections.
3. Indicate locations and details of anchorage devices and bearing plates to be embedded in other construction.

C. Welding Certificates: Copies of certificates for welding procedures and personnel.

D. Mill certificates signed by manufacturers of bolts certifying that their products comply with specified requirements.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing joists similar to those indicated for this Project and with a record of successful in-service performance.

1. Manufacturer must be certified by SJI to manufacture joists complying with SJI standard specifications and load tables.
2. Assumes responsibility for engineering special joists to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer licensed to practice in the State of Maine.
3. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the State of Maine and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of joists that are similar to those indicated for this Project in material, design, and extent.

B. SJI Specifications: Comply with SJI's "Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders" (hereafter, "Specifications"), applicable to types of joists indicated.

C. Steel Structures Painting Council - SSPC-PS 14.01 - Steel Joist Shop Paint System.

D. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel"; and AWS D1.3 "Structural Welding Code--Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

B. Handle, transport, and store steel joists, steel joist substitutes, at the job site in a manner to prevent permanent distortion of any part or other damages affecting their structural integrity. Replace damaged items that cannot be restored to like-new condition. Store all items off the ground in a well-drained location protected from the weather and easily accessible for inspection and handling.

1.7 SEQUENCING

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJI's "Specifications" for chord and web members.

B. Welding Electrodes: Comply with AWS standards.

2.2 PRIMERS

A. Primer: SSPC-Paint 15, Type I, red oxide; FS TT-P-636, red oxide; or manufacturer's standard shop primer complying with performance requirements of either of these red-oxide primers.

2.3 OPEN-WEB K-SERIES STEEL JOISTS

A. Manufacture steel joists according to "Standard Specifications for Open Web Steel Joists, K-Series," in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord; of joist type indicated.

1. Joist Type: K-series steel joists and KCS-type K-series steel joists.

B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.

C. Camber joists according to SJI's "Specifications."

2.4 JOIST ACCESSORIES

A. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications."

1. Furnish additional erection bridging if required.

B. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.5 CLEANING AND SHOP PAINTING

A. Clean and prime steel joists, steel joist substitutes and steel trusses in accordance with SSPC-PS 14.01, Steel Joist Shop Paint System, except that paint shall conform to SJI specifications and shall be suitable for top coating. (At areas where steel joists, steel joist substitutes, and steel trusses are scheduled to receive a finish top coating, verify compatibility of primer.)

B. Apply one shop coat of primer to joists, joist accessories and trusses to be primed to provide a continuous, dry paint film not less than 1 mil thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.

C. Field weld joists to supporting steel bearing plates. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts as required by SJI "Specifications"..

E. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 REPAIRS AND PROTECTION

A. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates and abutting structural steel.

1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
2. Apply a compatible primer of the same type as the shop primer used on adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 05210

SECTION 05310 - STEEL DECK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Roof deck.

B. Related Sections include the following:

1. Division 5 Section "Structural Steel" for shop-welded shear connectors.
2. Division 5 Section "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.

1.3 SUBMITTALS

A. Product Data: For each type of deck, accessory, fastener, and product indicated.

B. Shop Drawings:

1. Show layout and types of deck panels.
2. Anchorage details.
3. Reinforcing channels, pans, deck openings, special jointing, accessories.
4. Fasteners to anchor deck to structure
5. Fasteners to stitch deck together at side laps and to attach accessories.

C. Product Certificates: Signed by steel deck manufacturers certifying that products furnished comply with requirements.

D. Welding Certificates: Copies of certificates for welding procedures and personnel.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

C. AISI Specifications: Calculate structural characteristics of steel deck according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members."

D. FM Listing: Provide steel roof deck evaluated by FM and listed in FM's "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

1.6 PROJECT CONDITIONS

A. Design:

1. Steel deck shall be designed in accordance with the AISI "Specifications for the Design of Cold-Formed Steel Structural Members." Simple short spans shall be avoided, and all deck units shall extend over three or more supports unless absolutely impractical.
2. Design Loads: As specified on the drawings.

PART 2 - PRODUCTS

2.1 ROOF DECK

A. Steel Acoustic Roof Deck (3"): Provide painted steel acoustic roof deck with 3" batt insulation and all necessary accessories conforming to ASTM A 611, Grade C. Steel deck shall be 18-gauge with all required accessories for a complete and finished installation. Accessories to be of the same material as the deck unless otherwise specified. Metal deck shall be Type NSA, Test A76-125 with 3" batt insulation by United Steel Deck, Inc., or approved equal.

2.2 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Adjusting Plates: Provide adjusting plates or segments of roof units in locations too narrow to accommodate full-size roof units. As far as practical, provide plates of the same gauge and configuration as the roof units. Plates of predetermined sizes shall be factory cut.

C. Reinforcing Plates: Provide .057" thick reinforcing plates for all openings less than 12 inches in diameter. Length and width of plates as required satisfying The Steel Deck Institute requirements.

D. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners equal to Hilti X-EDNI19-THQ12-HSN; or # 12 self-drilling, self-threading screws.

E. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 12 minimum diameter.

F. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

G. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

H. Steel Sheet Accessories: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.

I. End Closures: Provide end closures of minimum 22 gauge to close the ends at end walls, eaves, and openings through the roof.

J. Acoustic Batts: Provide and install 3" fiberglass batts in all ribs. The batts shall fit snugly ito all ribs with the but joints fitted tightly with no gaps.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 29, manufacturer's written instructions, and requirements in this Section.

B. Locate decking bundles to prevent overloading of supporting members.

1. Exercise special care not to damage the material or overload the decking during the entire construction period. The maximum uniform distribution storage load shall not exceed the design live load.

C. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

1. Simple short spans shall be avoided, and all deck units shall extend over three or more supports unless absolutely impractical. Do not use unanchored deck units as a work or storage platform.

D. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

E. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to decking. Reinforce and frame openings through roof in accordance with the drawings for rigidity and load-carrying capacity. Holes or other openings required for the work of other trades shall be drilled or cut and reinforced by the respective trades; the deck manufacturer and the Engineer shall approve such holes or other openings larger than 6 inches in diameter.

F. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking, and support of other work.

G. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

H. Mechanical fasteners must be used in lieu of welding to fasten the deck to the structure. Locate mechanical fasteners and install according to deck manufacturer's written instructions. **Due to Lead based coatings on the support steel welding of the deck to joist or purlins is not allowed.**

3.3 DECK INSTALLATION

A. Immediately after placement and alignment, and after inaccuracies have been corrected, permanently fasten steel roof deck and floor deck units in place. Clamp or weight deck units to provide firm contact between deck units and structural supports while fastening is being performed. Decking shall be fastened as recommended by the manufacturer unless indicated otherwise on the drawings.

1. Mechanically fasten with self-drilling No. 12 diameter or larger carbon-steel screws or Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners equal to Hilti equal to Hilti X-EDNI19-THQ12-HSN.

B. End Bearing: Install deck ends over supporting frame as per drawings or unless otherwise noted, with a minimum end bearing of 2" inches., with end joints as follows:

1. End Joints: Lapped **2 inches** minimum.
2. side lap: Flat non-interlocking, stitched.

C. Miscellaneous Roof Deck Accessories: finish strips, cover plates, end closures, and reinforcing channels according to deck manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Inspect the decking top surface for flatness after installation. Place a four-foot straightedge across the decking ribs over the structural supporting members at all locations. If the

straightedge fails to touch the entire top surface of the decking or if top surfaces of abutting units are not in alignment, corrective measures or replacement shall be provided. After corrective measures or replacement has been performed, the decking shall be reinspected.

B. Field welds will be subject to inspection.

C. Testing agency will report test results promptly and in writing to Contractor and Engineer.

D. Remove and replace work that does not comply with specified requirements.

3.5 REPAIRS AND PROTECTION

A. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.

B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05310

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Steel Ladders
2. Loose bearing and leveling plates.
3. Loose steel lintels.
4. Steel framing and supports for applications where framing and supports are not specified in other Sections.
5. Bar-joist web reinforcement using flat bars.

B. Related Sections include the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
2. Division 5 Section "Structural Steel" for structural-steel framing system components.
3. Division 6 Section "Rough Carpentry" for metal framing anchors and other rough hardware.

1.2 SUBMITTALS

A. Shop Drawings: Detail fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1. Provide templates for anchors and bolts specified for installation under other Sections.

B. Welding Certificates: Copies of certificates for welding procedures and personnel.

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.3 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. AWS D1.3, "Structural Welding Code--Sheet Steel."

3. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.4 PROJECT CONDITIONS

A. This project includes the removal and or preparations of lead coated surfaces, under Section 013280 "Hazardous Material Remediation" of this project manual, as required on the demolition plans and in the room finish schedule. The following surfaces have been identified by a lead survey conducted by a state licensed inspector to contain lead coated surfaces.

1. All steel columns and steel girder members tested greater than 0.02 mg/Ft^2 by XRF. (Any XRF reading above 0.02 mg/Ft^2 should be considered as containing lead based substances.) These members will require removal of lead coatings to facilitate the welding of new steel onto the existing and to facilitate the cutting and removal of some members.
2. The contractor shall be responsible to coordinate with section 013280 to ascertain the locations requiring removal of lead coatings to facilitate the renovations.

B. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.5 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1. coordinate with Section 13280

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500.

C. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

D. Malleable-Iron Castings: ASTM A 47, Grade 32510 (ASTM A 47M, Grade 22010).

E. Gray-Iron Castings: ASTM A 48, Class 30 (ASTM A 48M, Class 200), unless another class is indicated or required by structural loads.

F. Cast-in-Place Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47 (ASTM A 47M) malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.

G. Welding Rods and Bare Electrodes: E70.

2.3 PAINT

A. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

B. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

C. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 FASTENERS

A. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36.

D. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

F. Wood Screws: Flat head, carbon steel, ASME B18.6.1.

G. Plain Washers: Round, carbon steel, ASME B18.22.1 (ASME B18.22M).

H. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1 (ASME B18.21.2M).

I. Adhesive Anchors: Threaded anchors with a chemical capsule containing prepared amounts of liquid polyester resin, quartz aggregate, and a catalyst. Size and embedment depth shall be as noted on the drawings, or if not noted, as required to withstand required loading. Acceptable products include, but are not limited to:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. Hilti HVA Adhesive Anchors
b. Red Head Redi-Chem Anchors
c. Rawl Needle-Capsule Anchors System
d. Fastenal Chemical Capsule Anchors

J. Sleeve Anchors: Hilti with Hex Nut (HX). Provide tamperproof nut as indicated.

K. Renovation Anchors: Hilti, HIT C-20 system, female type.

2.5 CONCRETE FILL

A. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa), unless otherwise indicated.

2.6 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Shear and punch metals cleanly and accurately. Remove burrs.

C. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

E. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

F. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

G. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

H. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

I. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

J. Remove sharp or rough areas on exposed traffic surfaces.

K. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

2.7 STEEL LADDERS

A. General: Fabricate ladders for locations shown, with dimensions, spacings, details, and anchorages as indicated.

1. Comply with ANSI A14.3, unless otherwise indicated.

B. Fabricate ladders from materials as detailed on the drawings or if not indicated, as follows:

1. Siderails: Continuous, Schedule 40 pipe per drawing details
2. Bar Rungs: as detailed and spaced 12 inches (300 mm) o.c.
3. Fit rungs in centerline of side rails; plug-weld and grind smooth on outer rail faces.
4. Support each ladder at top and bottom and not more than 60 inches (1500 mm) o.c. with welded or bolted steel brackets. Size brackets to support design loads specified in ANSI A14.3.
5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.

2.8 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

2.9 LOOSE STEEL LINTELS

A. Fabricate loose structural-steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.

B. Weld adjoining members together to form a single unit where indicated.

C. Size loose lintels to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches (200 mm), unless otherwise indicated.

D. Galvanize loose steel lintels located in exterior walls.

2.10 STRUCTURAL MODIFICATIONS

A. General: Provide steel Plates, bars, angles and shapes as detailed to modify existing structural members.

2.11 MISCELLANEOUS FRAMING AND SUPPORTS

A. Fabricate units from structural-steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

1. Fabricate units from slotted channel framing where indicated.
2. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors 1-1/4 inches (32 mm) wide by 1/4 inch (6 mm) thick by 8 inches (200 mm) long at 24 inches (600 mm) o.c., unless otherwise indicated.
3. Furnish inserts if units must be installed after concrete is placed.

B. Fabricate supports for operable partitions as follows:

1. Beams: Continuous steel shapes of sizes indicated with attached bearing plates, anchors, and braces as indicated. Drill bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

2.12 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.13 STEEL AND IRON FINISHES

A. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

B. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

E. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.2 SETTING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

1. Use nonshrink, nonmetallic grout, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

C. Where bearing plates are indicated with integral anchors, set in cement grout while grout is fluid. Level the surface and provide temporary support while grout hardens. Do not force anchors in partially hardened grout.

1. Where non-shrink grout is indicated, pack between bearing surfaces as indicated above.

3.3 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings, if any.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

C. Support steel girders on solid grouted masonry, concrete, or steel columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of columns.

1. Where grout space under bearing plates is indicated at girders supported on concrete or masonry, install as specified above for setting and grouting bearing and leveling plates.

D. Install columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified above for setting and grouting bearing and leveling plates.

1. Do not grout baseplates of columns supporting steel girders until girders are installed and leveled.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 Section "Painting."

END OF SECTION 05500

SECTION 06100 - ROUGH CARPENTRY

GENERAL

SUMMARY

This Section includes the following:

1 Framing with dimension lumber.
2 Rooftop equipment bases and support curbs.
3 Wood blocking and nailers.
4 Sheathing.

Related Sections include the following:

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

DEFINITIONS

Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise indicated.

Exposed Framing: Dimension lumber not concealed by other construction.

Lumber grading agencies, and the abbreviations used to reference them, include the following:

1 NELMA - Northeastern Lumber Manufacturers Association.
2 SPIB - Southern Pine Inspection Bureau.

SUBMITTALS

Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

3 Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
4 Include copies of warranties from chemical treatment manufacturers for each type of treatment.

Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee Board of Review.

Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

5 Engineered wood products.

DELIVERY, STORAGE, AND HANDLING

Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

6 Pressure-Treated Wood:

a Hickson Corp.
b Hoover Treated Wood Products, Inc.
c Osmose Wood Preserving, Inc.

WOOD PRODUCTS, GENERAL

Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.

7 Factory mark each piece of lumber with grade stamp of grading agency.
8 Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
9 Provide dressed lumber, S4S, unless otherwise indicated.
10 Provide dry lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

Wood Structural Panels:

11 Plywood: DOC PS 1.
12 Thickness: As needed to comply with requirements specified but not less than thickness indicated.
13 Factory mark panels according to indicated standard.

WOOD-PRESERVATIVE-TREATED MATERIALS

Pressure-Treated Wood: AWPA C2 (lumber) and AWPA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

14 Preservative Chemicals: Acceptable to authorities having jurisdiction and the following:

a Chromated copper arsenate (CCA).

15 For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.

Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

16 For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece, or omit marking and provide certificates of treatment compliance issued by inspection agency.

Application: Treat items indicated on Drawings, and the following:

17 Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
18 Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
19 Wood framing members less than 18 inches (460 mm) above grade.
20 Wood floor plates that are installed over concrete slabs directly in contact with earth.

DIMENSION LUMBER

General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.

Framing, Rafters, Joists, and Partitions: Construction, Stud, or No. 2 grade and any of the following species:

21 Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.

MISCELLANEOUS LUMBER

General: Provide lumber for support or attachment of other construction, including the following:

22 Rooftop equipment bases and support curbs.
23 Blocking.
24 Nailers.

For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 15 percent maximum moisture content and any of the following species:

25 Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.

SHEATHING

Oriented-Strand-Board Wall Sheathing: APA rated sheathing, Exposure 1.

26 Span Rating: Not less than 24/0.
27 Thickness: Not less than 3/4 inch (19 mm), unless noted otherwise.

Plywood Roof Sheathing: APA rated sheathing, Exposure 1, fir plywood.

28 Span Rating: Not less than 32/16.
29 Thickness: Not less than 5/8 inch (16 mm), unless noted otherwise.

FASTENERS

General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

30 Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

Nails, Brads, and Staples: ASTM F 1667.

Power-Driven Fasteners: CABO NER-272.

Wood Screws: ASME B18.6.1.

Screws for Fastening to Cold-Formed Metal Framing: Hilti Kwik-Flex or Elco Dril-Flex; no substitutes, 10-24 x 1-1/4 inch wafer head #3.

Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M).

Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

METAL FRAMING ANCHORS

General: Provide framing anchors made from metal indicated, of structural capacity, type, and size indicated, and as follows:

31 Research/Evaluation Reports: Provide products acceptable to authorities having jurisdiction and for which model code research/evaluation reports exist that show compliance of metal framing anchors, for application indicated, with building code in effect for Project.

32 Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

EXECUTION

INSTALLATION, GENERAL

Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

33 CABO NER-272 for power-driven fasteners.
34 Published requirements of metal framing anchor manufacturer.
35 Table 2305.2, "Fastening Schedule," in the BOCA National Building Code.

Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

Use finishing nails for exposed work, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.

WOOD BLOCKING, AND NAILER INSTALLATION

Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build anchor bolts into masonry during installation of masonry work. Where possible, secure anchor bolts to formwork before concrete placement.

WOOD FRAMING INSTALLATION, GENERAL

Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.

Do not splice structural members between supports.

Where built-up beams or girders of 2-inch nominal- (38-mm actual-) dimension lumber on edge are required, fasten together with 2 rows of 20d (100-mm) nails spaced not less than 32 inches (812 mm) o.c. Locate one row near top edge and other near bottom edge.

36 For continuous members, locate end joints over supports.

WALL AND PARTITION FRAMING INSTALLATION

General: Arrange studs so wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Anchor or nail plates to supporting construction, unless otherwise indicated.

Construct corners and intersections with three or more studs. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

37 Provide continuous horizontal blocking at midheight of partitions more than 96 inches (2438 mm) high, using members of 2-inch nominal (38-mm actual) thickness and of same width as wall or partitions.

Fire block concealed spaces of wood-framed walls and partitions at each floor level and at ceiling line of top story. Where fire blocking is not inherent in framing system used, provide closely fitted wood blocks of 2-inch nominal- (38-mm actual-) thick lumber of same width as framing members.

Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.

38 For non-load-bearing partitions, provide double-jamb studs with headers not less than 4-inch nominal (89-mm actual) depth for openings 48 inches (1200 mm) and less in width, 6-inch nominal (140-mm actual) depth for openings 48 to 72 inches (1200 to 1800 mm) in width, 8-inch nominal (184-mm actual) depth for openings 72 to 120 inches (1800 to 3000 mm) in width, and not less than 10-inch nominal (235-mm actual) depth for openings 10 to 12 feet (3 to 3.6 m) in width.

39 For load-bearing walls, provide double-jamb studs for openings 72 inches (1800 mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated.

WOOD STRUCTURAL PANEL INSTALLATION

General: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.

Fastening Methods: Fasten panels as indicated below:

40 Sheathing:

a Nail to wood framing.
b Screw to cold-formed metal framing.
c Space panels 1/8 inch (3 mm) apart at edges and ends.

END OF SECTION 06100

SECTION 07115 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes cold-applied, emulsified-asphalt dampproofing applied to the following surfaces:

1. Exterior face of inner wythe of exterior masonry cavity walls.

B. Related Sections include the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
2. Division 4 Section "Unit Masonry Assemblies" for all masonry work.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for method of application, primer, number of coats, coverage or thickness, and protection course.

B. Material Certificates: For each product, signed by manufacturers.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain primary dampproofing materials and primers through one source from a single manufacturer. Provide secondary materials recommended by manufacturer of primary materials.

1.4 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt dampproofing to be performed according to manufacturers' written instructions.

B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has thoroughly cured.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cold-Applied, Emulsified-Asphalt Dampproofing:

a. Euclid
b. Karnak Corporation.
c. Meadows, W. R., Inc.
d. Sonneborn, Div. of ChemRex, Inc.

2.2 BITUMINOUS DAMPPROOFING

A. Trowel Grade: ASTM D 1227, Type II, Class 1.

1. Available Products:

a. Sealmastic, Type 3; W. R. Meadows
b. Hydrocide 700; Sonneborn Building Products.
c. Dampproofing Asphalt Coatings Mastic; Euclid
d. Karnak 920; Karnac Chemical Corp.

B. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.

1. Available Products:

a. Sealmastic, Type 2; W. R. Meadows
b. Hydrocide 700B; Sonneborn Building Products.
c. Dampproofing Asphalt Coatings Semimastic; Euclid
d. Karnak 220; Karnac Chemical Corp.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Applicator present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.

1. Begin dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protection of Other Work: Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.

B. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

3.3 APPLICATION, GENERAL

A. Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.

1. Apply additional coats if recommended by manufacturer or required to achieve coverages indicated.
2. Allow each coat of dampproofing to cure 24 hours before applying subsequent coats.

B. Apply dampproofing to provide continuous plane of protection on exterior face of inner wythe of exterior masonry cavity walls.

1. Lap dampproofing at least 1/4 inch (6 mm) onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.

3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. On Exterior Face of Inner Wythe of Cavity Walls: Apply one brush or spray coat at not less than 1.25 gal./100 sq. ft. (0.5 L/sq. m).

3.5 CLEANING

A. Remove dampproofing materials from surfaces not intended to receive dampproofing.

END OF SECTION 07115

SECTION 07531 - EPDM MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Adhered membrane roofing system.
2. Roof insulation.Fascias, Scuppers and Downspouts.
4. Roof Drains.
5. Gravel Stops
6. Drip Edge

B. Related Sections include the following:

1. Division 6 Section Rough Carpentry for wood nailers, curbs, and blocking, and for wood roof deck panels.
2. Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.
3. Division 7 Section "Joint Sealants.".

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," before multiplication by a safety factor.

C. Factored Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," after multiplication by a safety factor.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

1. All materials used shall be 100% asbestos free.

C. Regulatory Requirements:

1. OSHA Requirements - Special attention is to be given to 29 CFR 1926.500(g) - Guardrails, Handrails, and Covers - for the roofing projects.

D. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7-latest revision.

1. Corner Uplift Pressure: 52-lbf/sq. ft..
2. Perimeter Uplift Pressure: 40-lbf/sq. ft..
3. Field-of-Roof Uplift Pressure: 28-lbf/sq. ft..

E. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

1. Fire/Windstorm Classification: Class 1-90.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Submit copies of descriptive literature to the Engineer for approval. The literature shall include information on the roofing membrane with all ancillary materials required, roof insulation, fascia systems, coping system, scuppers, downspouts, gravel stops, expansion joints, application methods and a copy of the roof system manufacturers standard "Total System Warranty".

B. Shop Drawings: For roofing system, submit copies of literature to Engineer for approval. Include plans, elevations, sections, details, and attachments to other Work.

1. Check field dimensions and make fabricated work correspond to approved shop drawings and conditions.
2. Fascia system, coping system, scuppers, downspouts and sheet metal work indicating materials, thickness, weights and methods of installation.
3. Sheet sizes and splice locations.
4. Base flashings and membrane terminations.
5. Tapered insulation, including slopes.
6. Insulation fastening patterns.

7. Special details.
8. Adjacent work of other trades

C. Manufacturer's Standard Details and Shop Drawings: Shop drawings are required for final inspection of the warranted roof. All shop drawings must include as-built conditions of the following:

1. Outline of the roof and roof size.
2. Location and type of penetrations.
3. Perimeter and penetration details.
4. Special details.
5. Bill of material.
6. Manufacturer's assigned number.

D. Post Submittals:

1. The roof system manufacturer's standard "Total System Warranty" with the shop drawings as required in paragraph C above. .
2. A Copy of roofing system manufacturer's inspection report of completed roofing installation.

E. Approval: Roof system manufacturer shall approve all details relating to the installation of the roof system.

F. Samples for Verification: For the following products:

1. 12-by-12-inch square of sheet roofing, of color specified, including T-shaped side and end lap seam.
2. 6-by-6-inch square of roof insulation.
3. 6 inch long piece of fascia, coping, scuppers, downspouts .
4. 12-by-12-inch square of walkway pads or rolls.
5. 12-inch length of metal termination bars.
6. 12-inch length of battens.
7. One insulation fasteners of each type, and finish.
8. One roof cover fasteners of each type, length, and finish.

G. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

H. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of meeting performance requirements.
2. Include name and location of contract, reference to specific material usage, and related reference standards.
3. Include related current test reports performed in accordance with specified standards. The testing shall have been performed by an approved independent laboratory. Test reports on previously tested materials shall be accompanied by notarized certificates from the manufacturers attesting that the previously tested material is of the same type, quality, manufacturer, and make as that submitted for this project.

4. Furnish a certificate that the system used will have a U.L. Class A label

I. Letter of Suitability: Signed by roofing manufacturer stating that the insulation is suitable for use in the specified system.

J. Maintenance Data: For roofing system to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

a. The Roofing Contractor shall use only competent and skilled workmen completely familiar with the products and the manufacturer's currently recommended methods of installation.
b. The Roofing Contractor shall be able to substantiate they have installed a minimum of 500,000 square feet of roofing of this type and have a manufacturer's installation rating of 9.0 or better.

B. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

C. Preinstallation Conference: Before installing any components of the roof system, conduct conference at Project site Provide at least 5 working days notice before the conference. Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Owner; Architect; Owner's insurer if applicable; testing and inspecting agency representative; roofing Installer; roofing system manufacturer's representative; deck Installer; and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.

8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

1. All materials furnished by the systems manufacturer, other than membrane, shall be stored between 60 degrees F and 80 degrees F. Should they be exposed at lower temperatures, restore to above temperature prior to use. Do not use materials damaged in handling or storage. All cardboard containers shall be stored in a dry area.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturers written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PRODUCT HANDLING

A. The Roofing and Flashing Subcontractor shall furnish and maintain his own scaffolding, mechanical hoisting equipment and operating personnel, and all required rigging.

B. No materials weighing in bulk over 1,000 pounds shall be hoisted upon any roof deck without the prior supervision and approval of the Engineer or his Representative.

1.9 INSPECTION

A. Upon completion of the installation, an inspection shall be made by a representative of the roof system manufacturer to ascertain that the roofing system has been installed according to published specifications and details. Warranty shall be issued to the Owner upon manufacturer's approval of the installation.

1.10 DEVIATION

A. The latest printed specifications of the approved roofing materials manufacturer shall govern the work unless a more stringent requirement is specified herein.

1.11 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.WARRANTY

A. A manufacturer's sole source 15 year Total Roofing System Warranty shall be provided with a peak gust wind speed limitation of 80 mph (measured 30 feet above the ground). Warranty shall cover both labor and materials with no dollar limitation and shall state that the Total Roofing System will remain in a watertight condition. The contractor shall provide as part of the shop drawing submittal process, certification indicating that the manufacturer has reviewed and has agreed to such wind coverage indicated.

1. Total Roofing System is defined as the following materials and provided by the roof system manufacturer: membrane, flashings, counterflashings, adhesives, sealants, insulation, overlayment, fasteners, fastener plates, fastener strips, hard rubber, metal edging, preformed fascia system, metal termination anchor bars, roof drain flashing and sealants, and any other product utilized in this system installation.
2. The warranty shall also provide without any limitations that the insulation shall retain at least 80% of its thermal resistance.
3. The warranty shall be for fifteen (15) years starting after final acceptance of the total roofing system by the roof system manufacturer. Defective materials or installation shall be removed, properly disposed of, and replaced at the manufacturer's expense.
4. The warranty shall provide that if within the warranty period the roofing system becomes non-watertight or if the elastomeric sheet splits, tears, or separates at the seams because of defective materials and/or workmanship that correction of defective workmanship and/or material and cost thereof shall be the responsibility of the manufacturer. Should the manufacturer or his approved applicator fail to perform repairs within 72 hours of notification, the warranty will not be voided because of work being performed by others to repair the roofing regardless of the manufacturer's warranty to the contrary.
5. The Total Roofing System shall be applied by a Roofing Contractor approved by the system manufacturer. After inspection and acceptance of the installed roof system, the warranty will be issued.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements of this section, provide products by one of the following:

1. EPDM Sheet

   a. Carlisle Syntec Systems; Carlisle Corp
   b. Firestone Building Products Company
   c. Versico Inc.

2. Rigid/tapered insulation: Manufacturer as required by the roofing system manufacturer for total system warranty.
3. Roof Drains: By roofing installer.
4. Fascia: Shop fabricated by roofing installer.

2.2 EPDM ROOFING MEMBRANE

A. EPDM Roofing Membrane: ASTM D 4637, Type I, nonreinforced] uniform, flexible sheet made from EPDM, and as follows:

1. Thickness: .060", nominal.
2. Exposed Face Color: Black.
3. Backing: unbacked.

2.3 AUXILIARY MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.

1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

B. Sheet Flashing: .060"- thick EPDM, partially cured or cured, according to application.

C. Bonding Adhesive: Manufacturer's standard bonding adhesive.

D. Seaming Material: Manufacturer's standard synthetic-rubber polymer primer and **3-inch-** wide minimum, butyl splice tape with release film].

E. Lap Sealant: Manufacturer's standard single-component sealant, color to match roofing membrane.

F. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.

G. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

H. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

I. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, in-seam sealants,

termination reglets, and other accessories recommended by roofing system manufacturer for intended use.

J. Cover Board: Cellulostic-fiber insulating board, ASTM C 208, Type II, Grade 2, ½ inch thick.

2.4 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Roof Insulation (Rigid): Glass fiber reinforced facers integrally laminated to the rigid polyisocyanurate foam core on both sides. Insulation to be compatible with the membrane used and supplied by the membrane manufacturer. Tapered as required, to form crickets.

1. The insulation system shall consist of polyisocyanurate foam panels, chemically bonded during the foaming process to facers on the top and bottom surfaces, and shall conform to the following:

Property	Test Method	Specification
*Thermal Performances	ASTM C 518	as required
Water Absorption % Volume	ASTM C 209	1
Dimensional Stability	70 degrees C/100% RH	1%
Compressive Strength	ASTM D 1621	18 psi
Foam Core Density	ASTM D 1622	2.0 lbs/cu. ft.
Moisture Vapor Transmission	ASTM C 355	1
Service Temperature	----------	-100 degrees F to +250 degrees F
Flame Spread	ASTM E 84	25

*Thermal values for the installed tapered insulation system shall be "LTTR" values and determined in accordance with CAN/ULC-S770 test method.

2. Insulation system facers shall be glass fiber reinforced mat asphaltic.
3. The tapered insulation system used for crickets shall have a minimum slope of 1/4" per foot unless indicated otherwise on the drawings.
4. The insulation system shall have a minimum thickness of 2" and a minimum average "LTTR" value of 30 unless indicated otherwise on the drawings.
5. Insulation to be compatible with the membrane used and supplied by the membrane manufacturer.

C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.5 INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by roof system manufacturer for intended use and compatible with membrane roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Overlayment: Meeting ASTM C 208, Class E, ASTM 209, Roof Insulating Board Grade. Manufacturer shall mark each package, giving kind of chemical and guarantee minimum quantity contained. Fiberboard shall be 1/2" thick unless otherwise indicated, high density fiberboard.

2.6 WALKWAYS

A. Flexible Walkway pads or rolls: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch thick, and supplied by the roofing system manufacturer.

2.7 FASCIAS and METAL FLASHING:

A. Fascia System : 24-gauge zinc coated steel Fascia System with Kynar 500 finish. Shop fabricated fascia systems will be acceptable and must be fabricated to look similar in shape to the detail on the drawings with a continuous blind nailer to attach the bottom edge and a maximum height of 8".

1. Fascia Extender: 24 gauge zinc coated steel, with Manufacturer's standard, , Kynar 500 finish, and 24 gauge galvanized steel continuous fastening cleat
2. Blind nailers: shall be the same material and gauge as the fascia.

2.8 ROOF DRAINS

A. Roof Drains:. Shall be equal to Zurn Z-100 15" diameter main roof drain, Dura-coated cast iron body with combination membrane flashing clamp/ gravel guard, with low silhouette Poly-dome 4" no-hub outlet and Under deck Clamp with for all drains in the main roofs.

1. Drains at the base of the slopped roofs shall be Zurn Z-160 135 degree Scupper drain, Dura-coated cast iron body, plane bronze grate with integral membrane clamp

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 5 Section "Steel Deck."
4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 INSULATION INSTALLATION

A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2 inches or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 12 inches in each direction.

E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

1. Provide a square sump at all roof drains as indicated on the drawings. If not indicated, provide a four foot square sump (roof drain to be in center of sump) with a 1/4" per foot pitch from the four sides of the sump toward the roof drain.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

G. Mechanically Fastened Insulation: Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Loosely butt cover boards together and fasten to roof deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type:

1. Fasten insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.1-90.
2. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
3. Mechanical fasteners at exposed metal deck in finished areas shall only be fastened to the high point of the metal decking with a penetration not exceeding 3/4". Fastening to the low point of the metal decking in these areas will not be acceptable.

3.4 ADHERED ROOFING MEMBRANE INSTALLATION

A. Install EPDM roofing membrane over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

B. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical personnel.

C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Bonding Adhesive: Apply bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.

E. Apply roofing membrane with side laps shingled with slope of roof deck where possible.

F. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.

G. Repair tears, voids, and lapped seams in roofing that does not meet requirements.

H. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

I. Install roofing membrane and auxiliary materials to tie in to existing roofing.

3.5 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.6 FASCIA:

A. Fascia System: Installation of fascias, scuppers, and downspouts shall be as indicated on the drawings and in strict accordance with manufacturer's recommendations.

1. All Metal Work: Flashing, sheet metal, and accessories shall be fabricated as specified herein and indicated on the drawings; if not specified or indicated, comply with applicable details and requirements of the latest editions of the Revere "Copper and Common Sense" Manual and the SMACNA "Architectural Sheet Metal" Manual and other recognized practices of the industry. The completed installation shall be fabricated and installed for waterproof and weather-tight performance.
2. All fastening of metal shall be installed in a way to ascertain the metal work will not either pull free or buckle which could eventually cause roofing problems.

3.7 MISCELLANEOUS INSTALLATIONS

A. Roof Drains: Installation of roof drains shall be as indicated on the drawings and in strict accordance with manufacturer's recommendations.

B. Expansion Joints shall be installed as shown on details and manufacturer's recommendations.

C. Unusual Penetrations: Clusters of pipes and unusual shaped penetrations shall be sealed with pourable sealer, 2" deep minimum, in a pitch pocket type seal.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: The Owner may engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports if deemed necessary.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

1. Notify Architect or Owner 48 hours in advance of date and time of inspection.

C. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 PROTECTING AND CLEANING

A. Protect membrane-roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Engineer and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07531

SECTION 07841 - THROUGH-PENETRATION FIRESTOP SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes (unless specified elsewhere) through-penetration firestop systems for penetrations through, and at the top of, the following fire-resistance-rated assemblies, including both empty openings and openings containing penetrating items:

1. Walls and partitions.
2. Smoke barriers.
3. Construction enclosing compartmentalized areas.

1.2 DEFINITIONS

A. Firestops: Specially tested materials used to reestablish the integrity of a fire rated wall, floor, or other partition after the structure has been breached for the through-penetration of building.

B. Through Penetration: Pipes, conduits, ducts, cable trays, cable, wire or other element passing completely through an opening in a fire rated barrier/assembly.

C. Membrane Penetration: Penetration of a fire rated barrier that breaches on side, but does no pass completely through to the other side.

D. System: The combination of specific materials and/or devices, including the penetrating item(s) required to complete the firestop, as tested by an independent third party test facility.

E. Barrier/Assembly: A wall, floor, or other partition with a fire – smoke rating of 1, 2, or 3 hours.

F. F-Rating: The time a firestop (penetrating item/building material/firestop material) can withstand direct flame without a burn through as tested to ASTM E814 / UL 1479.

G. T-Rating: The amount of time a through-penetration firestop limits the temperature rise on the cold side (outside the test furnace) as tested to ASTM E814 / UL 1479.

H. L-Rating: The L-Rating criteria determines the amount of air leakage, in cubic feet per minute, per square foot of opening (CFM/sq. ft). through the firestop system at ambient and/or 400 degrees F. air temperature at an air pressure differential of 0.30in. W.C. L-Ratings are used to determine the suitability of a firestop to stop smoke and toxic gases in accordance with NFPA Life Safety Code, 101.

1.3 PERFORMANCE REQUIREMENTS

A. General: For the following constructions, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist

passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated.

1. Fire-resistance-rated load-bearing walls, including partitions, with fire-protection-rated openings.
2. Fire-resistance-rated non-load-bearing walls, including partitions, with fire-protection-rated openings.
3. Fire-resistance-rated floor assemblies.

B. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

C. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

1. Penetrations located outside wall cavities.
2. Penetrations located outside fire-resistive shaft enclosures.
3. Penetrations located in construction containing fire-protection-rated openings.
4. Penetrating items larger than 4-inch- (100-mm-) diameter nominal pipe or 16 sq. in. (100 sq. cm) in overall cross-sectional area.

D. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For floor penetrations with annular spaces exceeding 4 inches (100 mm) in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.
3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
4. For firestop systems exposed to view, provide acrylic based product for compatibility with finish painting.

E. For through-penetration firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-developed ratings of less than 450, as determined per ASTM E 84.

1.4 SUBMITTALS

A. Product Data: For each type of through-penetration firestop system product indicated. Literature shall indicate product characteristics, typical uses, performance and limitation criteria, and test data.

B. Shop Drawings: For each through-penetration firestop system, show each kind of construction condition penetrated, relationships to adjoining construction, and kind of penetrating item.

Include UL Tested System designation that evidences compliance with requirements for each condition indicated.

1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
2. Engineering Judgments: Where Project conditions require modification of qualified testing and inspecting agency's illustration to suit a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer.

C. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed through-penetration firestop systems similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, from a single manufacturer.

C. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in "Performance Requirements" Article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
2. Through-penetration firestop systems are identical to those tested per ASTM E 814. Provide rated systems complying with the following requirements:.

    a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
    b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:

        1) UL in "Fire Resistance Directory."

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

E. Special Inspections: Allow for 1 of each type of firestopping system to be removed and inspected for conformance with approved submittals. All firestopping shall be inspected prior to the installation of ceilings.

F. Above Ceiling review: Prior to the installation of ceilings, a review of construction completion shall be done for firestopping and other items that will not be visible when the ceilings have been installed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Notify Engineer at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until Engineer and building inspector, if required by authorities having jurisdiction, have examined each installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Firestop Systems Inc.
2. Hilti Construction Chemicals, Inc.
3. International Protective Coatings Corp.
4. Isolatek International.
5. 3M Fire Protection Products.
6. Nelson Firestop Products.

7. RectorSeal Corporation (The).
8. Specified Technologies Inc.

2.2 FIRESTOP SYSTEMS, GENERAL

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by the qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials, including the following:

   a. Slag-/rock-wool-fiber insulation.
   b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
   c. Fire-rated form board.
   d. Fillers for sealants.

2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

2.3 FILL MATERIALS

A. General: Provide through-penetration firestop systems containing the types of fill materials as required by UL approved Through-Penetration Firestop System. Fill materials are those referred to in directories of the referenced testing and inspecting agencies as fill, void, or cavity materials.

B. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

C. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

D. Elastomeric Spray: Single component, water-based elastomeric compound.

E. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

F. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

G. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

H. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

I. Mortars: Prepackaged, dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

J. Pillows/Bags: Reusable, heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.

K. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

L. Silicone Sealants: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.

2.4 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with written recommendations of firestop system manufacturer and the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General: Install through-penetration firestop systems to comply with "Performance Requirements" Article and firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Provide through-penetration firestop systems for conditions specified whether or not firestopping is indicated.

1. Through-Penetrations: Install through-penetration firestop systems in all open pentrations and in the annular space in all penetrations in fire-rated barriers.
2. Membrane-Penetrations: Install through-penetration firestop systems in rated walls. Where required by code, provide products that meet the requirements of third party time/temperature testing.
3. Construction Joints/Gaps: Provide through-penetration firestop systems for the following locations:

    a. Between the edges of floor slabs and exterior walls.
    b. Between the tops of walls and the underside of floors or roofs.
    c. In the control joints in masonry walls and floors.

4. Smoke Stopping: Provide smoke stops for through-penetrations, membrane penetrations, and construction gaps with a material approved and tested for such applications.

C. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

D. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

A. Prior to installation of ceilings, inspect penetrations requiring firestopping to verify complete installation of firestopping materials. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued.

B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

C. Reinstall firestopping materials that have been removed for inspection.

3.5 IDENTIFICATION

A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:

1. The words: "Warning--Through-Penetration Firestop System--Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Through-penetration firestop system designation of applicable testing and inspecting agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove

damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop systems complying with specified requirements.

END OF SECTION 07841

SECTION 07920 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes sealants for the following applications, including those specified by reference to this Section:

B. This Section includes sealants for the following applications:

1. Exterior joints in the following vertical surfaces:

   a. Control and expansion joints in cast-in-place concrete.
   b. Control and expansion joints in unit masonry.
   c. Joints between different materials listed above.
   d. Other joints as indicated.

2. Interior joints in the following vertical surfaces:

   a. Perimeter joints of exterior openings where indicated.
   b. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
   c. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
   d. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   e. Other joints as indicated.

C. Related Sections include the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
2. Division 7 Section "Through-Penetration Firestop Systems" for fire-resistant building joint-sealant systems.

1.2 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Engineer from manufacturer's full range for this characteristic.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant, including those referencing ASTM C 920 classifications for type, grade, class, and uses.

B. Additional Movement Capability: Where additional movement capability is specified in the Elastomeric Joint-Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.

C. Single-Component Nonsag Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:

1. Products: Provide one of the following.

    a. Vulkem 116; Mameco International.
    b. Vulkem 230; Mameco International.
    c. Sikaflex - 1a; Sika Corporation.
    d. NP 1; Sonneborn Building Products Div., ChemRex Inc.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Applications:

    a. Metal flashing joints.
    b. Joints between exterior metal frames and adjacent Work (except masonry).
    c. Under exterior door thresholds.

D. Multicomponent Nonsag Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:

1. Products: Provide one of the following:

    a. Chem-Calk 500; Bostik Inc.
    b. Vulkem 922; Mameco International.

c. Dynatrol 2; Pecora Corporation.
d. PSI-270; Polymeric Systems, Inc.
e. NP 2; Sonneborn Building Products Div., ChemRex Inc.
f. Sikaflex-2c, NS; Sika

2. Type and Grade: M (multicomponent) and NS (nonsag).
3. Class: 25.
4. Exterior Applications:

a. Control, expansion, and soft joints in masonry and concrete.
b. Between masonry and adjacent Work.
c. Exterior joints for which no other sealant type is indicated.

E. Mildew Resistant Silicone Sealant: Where joint sealants of this type are indicated provide products complying with the following:

1. Products: Provide one of the following:

a. 786; Dow Corning
b. Sanitary 1700; GE Silicones.
c. 898 Silicone Sanitary Sealant; Pecora Corporation.
d. PSI-611; Polymeric Systems, Inc.
e. Tremsil 600 White; Tremco.

2. Type and Grade: S (single component), and NS (nonsag).
3. Class 25
4. Additional Movement Capability: 50 percent movement in extension and 50 percent movement in compression for a total of 100 percent movement.
5. Applications:

a. Use for sealing interior joints with non-porous substrates in wet areas with ceramic tile or epoxy paint around sinks, and between equipment or counters and non-porous walls.

F. Multicomponent Pourable Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:

1. Products: Provide one of the following:

a. Chem-Calk 550; Bostik Inc.
b. Vulkem 245; Mameco International.
c. NR-200 Urexpan; Pecora Corporation.
d. Sikaflex - 2c SL; Sika Corporation.
e. SL 2; Sonneborn Building Products Div., ChemRex Inc.
f. THC-900; Tremco.

2. Type and Grade: M (multicomponent) and P (pourable).
3. Class: 25.
4. Applications:

a. Joints in exterior and interior concrete slabs on grade.

b. Joints in existing concrete slabs on grade.
c. At penetrations to new and existing slabs on grade.

2.4 LATEX JOINT SEALANTS

A. Latex Sealant Standard: Comply with ASTM C 834 for each product of this description indicated.

B. Latex Sealant: Where joint sealants of this type are indicated, provide products complying with the following:

1. Products: Provide one of the following.

a. Chem-Calk 600; Bostik Inc.
b. NuFlex 330; NUCO Industries, Inc.
c. LC 160 All Purpose Acrylic Caulk; Ohio Sealants, Inc.
d. AC-20; Pecora Corporation.
e. PSI-701; Polymeric Systems, Inc.
f. Sonolac; Sonneborn Building Products Div., ChemRex, Inc.
g. Tremflex 834; Tremco.

2. Applications: Interior joints in field painted vertical and overhead joints not indicated otherwise below.

2.5 PREFORMED JOINT SEALANTS

A. Preformed Foam Sealants: Provide manufacturer's standard preformed, precompressed, impregnated, open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water-repellent agent; factory produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following:

1. Properties: Permanently elastic, mildew resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
2. Impregnating Agent: Manufacturer's standard.
3. Density: Manufacturer's standard.
4. Backing: Pressure-sensitive adhesive, factory applied to one side with protective wrapping.
5. Available Products:

a. Emseal 25V; Emseal Joint Systems, Ltd.
b. Emseal Greyflex; Emseal Joint Systems, Ltd.
c. Polytite B; Polytite Manufacturing Corporation.
d. Polytite Standard; Polytite Manufacturing Corporation.
e. Wilseal 600; Sealform, Ltd.

6. Application: Exterior expansion joints in masonry veneers.

2.6 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Backer Rod: ASTM C 1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Type C: Closed-cell material with a surface skin.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where indicated and recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

1. Apply primer on all porous surfaces such as exterior masonry or precast concrete.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.

E. Install sealants by proven techniques to comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

a. Use masking tape to protect adjacent surfaces of recessed tooled joints.

G. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, to produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant to comply with sealant manufacturer's written instructions.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 07920

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and field painting of the following:

1. Exposed exterior items and surfaces.
2. Exposed interior items and surfaces.
3. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Related Sections include the following:

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

C. Paint exposed surfaces as the paint schedule indicates. If the schedules do not indicate color or finish, the Engineer will select from standard colors and finishes available.

1. Painting includes field painting of, exposed steel, steel deck and iron work. and any newly installed metal surfaces of mechanical and electrical equipment.

D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Finished mechanical and electrical equipment.
b. Light fixtures.
c. Distribution cabinets.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Furred areas.
b. Ceiling plenums.
c. Pipe spaces.
d. Duct shafts.

3. Finished metal surfaces include the following:

a. Anodized aluminum.
b. Stainless steel.
c. Chromium plate.
d. Copper.
e. Bronze and brass.

4. Operating parts include moving parts of operating equipment and the following:

   a. Valve and damper operators.
   b. Linkages.
   c. Sensing devices.
   d. Motor and fan shafts.

5. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

E. Related Sections include the following:

1. Division 5 Section "Structural Steel" for shop priming structural steel.
2. Division 5 Section "Metal Fabrications" for shop priming ferrous metal.
3. Division 13 Section "Hazard Materials Remediation" for lead coatings removals.
4. Divisions 15 and 16: Painting of mechanical and electrical work is specified in Divisions 15 and 16, respectively.

F. This project includes the removal of lead coated surfaces, under section 13280. The preparation of all lead coated surfaces to receive new paint shall be under this section. The following surfaces have been identified by a lead survey conducted by a state licensed inspector to contain lead coated surfaces.

1. All steel columns and steel girder members tested greater than 0.02 mg/Ft^2 by XRF. (Any XRF reading above 0.02 mg/Ft^2 should be considered as containing lead based substances.)

1.2 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
2. Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.
3. Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60-degree meter.
4. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
5. Full gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.

1.3 SUBMITTALS

A. Product Data: For each paint system specified. Include block fillers and primers.

1. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

B. Samples for Selection: Manufacturer's color chips showing the full range of colors available for each type of finish-coat material indicated.

1. After color selection, the Engineer will furnish color list of color selections for surfaces to be coated.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.

B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.

C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample of multi-colored coating and substrate required on the Project.

1. The Engineer will select one surface to represent surfaces and conditions for each type of coating and substrate to be painted.

a. Wall Surfaces: Provide samples on at least 100 sq. ft. (9 sq. m) of wall surface.

2. After permanent lighting and other environmental services have been activated, apply coatings in this room or to each surface according to the Schedule or as specified. Provide required sheen, color, and texture on each surface.

a. After finishes are accepted, the Engineer will use the room or surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from job-applied samples.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.

5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 PROJECT CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 deg F (10 and 32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 and 95 deg F (7.2 and 35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.7 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the Owner.
1. Quantity: Furnish the Owner with an additional 5 percent, but not less than 1 gal. (3.785 L) or 1 case, as appropriate, of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in the paint schedules.

B. Manufacturers Names: The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:

1. Sherwin-Williams Co. (S-W).
2. Tnemec (Tne)

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality professional paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: Allow for 5 color selections made by the Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Engineer about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

    a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
    b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.
    c. Where epoxy floor finish is indicated, clean concrete floors by abrasive blast-cleaning methods.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

    a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
    c. When transparent finish is required, backprime with spar varnish.
    d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
    e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.

    a. Blast steel surfaces clean as recommended by paint system manufacturer and according to requirements of SSPC-SP 10.
    b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

5. Galvanized Surfaces: Clean galvanized surfaces with a palm sander and 60 grit sandpaper so surface is free of surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

1. Do not tint prime or base coats for multi-colored finishes.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
2. Provide finish coats that are compatible with primers used.
3. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
5. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer on metal surfaces that have been shop primed and touchup painted.

3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.
2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and in occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Piping, pipe hangers, and supports.
2. Heat exchangers.
3. Tanks.
4. Ductwork.
5. Insulation.
6. Motors and mechanical equipment.
7. Accessory items.

G. Electrical items to be painted include, but are not limited to, the following:

1. Conduit and fittings.

H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

I. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.

J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting,

holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

K. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:

1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
2. The testing agency will perform appropriate tests for the following characteristics as required by the Owner:

a. Quantitative material analysis.
b. Abrasion resistance.
c. Apparent reflectivity.
d. Flexibility.
e. Washability.
f. Absorption.
g. Accelerated weathering.
h. Dry opacity.
i. Accelerated yellowness.
j. Recoating.
k. Skinning.
l. Color retention.
m. Alkali and mildew resistance.

3. The Owner may direct the Contractor to stop painting if test results show material being used does not comply with specified requirements. The Contractor shall remove noncomplying paint from the site, pay for testing, and repaint surfaces previously coated with the rejected paint. If necessary, the Contractor may be required to remove rejected paint from previously painted surfaces if, on repainting with specified paint, the 2 coatings are incompatible.

3.5 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Engineer.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 INTERIOR PAINT SCHEDULE

A. Ferrous Metal: Provide the following finish systems over ferrous metal:
1. Semigloss, Acrylic-Enamel Finish: One finish coat over an enamel undercoater and a primer. On surfaces that have a factory applied primer apply the undercoat and finish coat.

a. Primer: Quick-drying, rust-inhibitive, alkyd-based or epoxy-metal primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer.

1) S-W: DTM Acrylic Primer/Finish B66W1 Series.

b. Undercoat: Alkyd, interior enamel undercoat or semigloss, acrylic-latex, interior enamel, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer.

1) S-W: ProMar 200 Interior Latex Semi-Gloss B31W200 Series.

c. Finish Coat: Semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer.

1) S-W: ProMar 200 Interior Latex Semi-Gloss B31W200 Series.

B. Exposed Metal Deck and Steel Joists(Girters): Provide the following finish systems over ferrous metal:
1. Waterborne Acrylic Dry Fall, interior coating: 1 finish coat over factory primed metal deck. On Joist 2 finish coats over an Acrylic primer

a. Primer: Fast-drying, Corrosion resistant, Acrylic primer/finish, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer.

1) S-W: DTM Acrylic Primer/Finish B66W1 Series.

b. Undercoat: Waterborne Acrylic Dry Fall, interior coating, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer.

1) S-W: Waterborne Acrylic Dry Fall Eg-Shel, White, B42W2.

c. Finish Coat: Waterborne Acrylic Dry Fall, interior coating, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer.

1) S-W: Waterborne Acrylic Dry Fall Eg-Shel, White, B42W2.

3.8 EXTERIOR PAINT SCHEDULE:

A. All new and existing exposed iron, steel and other ferrous metals including roof fan housing, ventilators, ducts, louvers, exposed faces of lintels, shelf angles, columns, beams, and roof ladders:

a. First Coat: Tnemec-Series 37-77 Chem Prime
b. One Coat: Tnemec-Series 66 Hi-Build Epoxoline, 3-4 mils dry
c. One Coat: Tnemec-Series 73 Endura-Shield, 2-3 mils dry

END OF SECTION 09900

SECTION 13280 – HAZARDOUS MATERIAL REMEDIATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. The Maine Department of Environmental Protection, Chapter 425 Asbestos Management Regulations Latest addition Effective January 14, 2003 changed the requirements for training, and notifications for removal of asbestos containing roofing. The intent of this section is to follow the DEP chapter 425 latest addition and OSHA regulations for the removal of asbestos roofing materials. Post submittal requirements specified in this section shall be required as written.

B. Furnish all labor, materials, equipment, supplies, and perform all operations necessary to complete the Design, removal, encapsulation and or enclosure of asbestos-containing building materials (ACBM) by competent persons trained, knowledgeable and qualified in the techniques of asbestos abatement, handling and disposal of asbestos-containing building materials and asbestos-contaminated materials and the subsequent cleaning of contaminated areas, complying with all applicable federal, state, and local regulations in accordance with the drawings and these specifications.

C. Work contemplated will be the removal of asbestos-containing building materials where shown on the drawings or as identified in part 3 of this section.

D. Lead Coatings have been found in this facility and are identified in part 3 of this section. It shall be the responsibility of the contractor to follow all State and Federal regulations for the removal and disposal of lead coated materials, including all TCLP testing of materials prior to disposal.

1.3 QUALITY ASSURANCE

A. Job Site References: Have on the job site at all times at least one copy of the following:

1. Plans and Specifications
2. Federal Register - Part II, Department of Labor - OSHA - 29 CFR Parts 1910.1001 and 1926.58
3. Maine Department of Environmental Protection - Rules and Regulations Chapter 425.
4. Federal Register - Part II, Department of Labor - OSHA - 29 CFR Parts 1926.62 and

B. Medical Requirements: 29 CFR 1910.1001 and 1926.58

1. Medical Questionnaires: Administer medical questionnaires in accordance with 29 CFR 1910.1001-Appendix D and 29 CFR 1926.58-Appendix D.
2. Medical Examinations: Provide workers with a comprehensive medical examination as required by 29 CFR 1910.1001 and 1926.58. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving potential exposure to asbestos fibers and within 30 calendar days before or after the termination of employment in such occupation. Specifically identify X-ray films of asbestos workers to the consulting radiologist and mark medical record jackets with the word "ASBESTOS."
3. Medical Records: Maintain complete and accurate records of employee's medical examinations for a period of 30 years after termination of employment and make records of the required medical examinations available for inspection and copy to: The Assistant Secretary of Labor for Occupational Safety and Health, The Director of the National Institute for Occupational Safety and Health (NIOSH), authorized representatives of either of them, and an employee's physician upon the request of the employee or former employee.

C. Training Requirements:

1. Asbestos Workers: All workers must receive training per latest Maine DEP chapter 425 and all applicable OSHA regulations.
2. Asbestos Competent Person: All competent persons must receive training per latest Maine DEP chapter 425 and all applicable OSHA regulations.
3. Lead workers: All workers must receive training pursuant to the requirements of 29 CFR 1926.62, 29 CFR 1926.59,and 29 CFR 1926.21.

D. Safety Compliance: In addition to detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, state, regional, and local authorities regarding handling, storing, transporting and disposing of asbestos and or lead waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1910.1001; 40 CFR 61, Subparts A and B; and 29 CFR 1926.58. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification and referenced documents vary, the most stringent requirement shall apply.

E. Respirator Program: Establish a respirator program as required by 29 CFR 1910.1001 and 1926.58. This program will comply with all paragraphs of 29 CFR 1910.134.

1.4 PROJECT SECURITY

A. The Contractor is responsible for maintaining effective security of the project.

B. Entry into each work area shall be limited to the Engineer's Authorized Representatives, Owner's Authorized Representatives, and Government Agency's Representative authorized to inspect the project.

C. The Contractor shall provide entry for the Engineer and the Asbestos Air Monitor(s) to validate compliance with all abatement requirements.

D. Visiting personnel entering work areas must be provided with personal protective equipment as specified.

1.5 REMEDIAL CONTROLS

A. It is the responsibility of the Contractor to ascertain that the specifications are followed. If the situation is not covered by the specifications, the Engineer shall be contacted to obtain remedial controls.

1.6 DELIVERY AND STORAGE

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

B. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient enough to prevent damage or contamination. Replacement materials shall be stored outside of the work area until abatement is completed.

C. Damaged, deteriorating or previously used materials shall not be used and shall be removed from the work site and disposed of properly.

D. Asbestos-contaminated waste and lead contaminated waste shall be stored in separate areas, containers or trucks from new materials and supplies.

1.7 SUBMITTALS

A. Submittals must be received in accordance with and indexed in the order of the Submittal Index that follows before any material or equipment is purchased or work performed. The Contractor shall submit to the Architect/Engineer for review six (6) copies of the information required on the Submittal Index in this section. The adequacy and accuracy of submittals and their compliance with contract documents are the responsibility of the Contractor. All reviewing actions taken by the Architect/Engineer will in no way relieve the Contractor of his quality control requirements.

B. Work Practices and Procedures:

1. Submit a written company Standard Operation Procedures of the work procedures to be used in the removal and demolition of materials containing asbestos and or lead to the Architect/Engineer
2. Submit a work schedule, weekly goals and objectives, minimum daily staffing, and removal methods summary. The work schedule and weekly goals shall be illustrated on a bar graph.
3. The Contractor shall be responsible for the basic design of all work performed under this section, they shall submit a plan to include all phasing, the location of asbestos and or lead control areas, decontamination area, equipment decontamination enclosure, interface of trades involved in the construction, sequencing of asbestos-related work, sequencing of asbestos-related work, disposal plans, type of wetting agent and sealant to be used for asbestos removal, type of removal process for lead coatings, personal air monitoring

program and a detailed description of the method to be employed to prevent fiber release, and lead dust release.. Show point of controlled access to the building for transporting asbestos-containing and lead containing building material from the regulated area to the exterior of the building. Show auxiliary make-up air points, location of HEPA exhaust ventilation unit location of HEPA exhaust and location of pressure differential meter sensor. This plan must be approved by the Architect/Engineer prior to the beginning of any asbestos abatement work.

4. The contractor shall also submit a Lead Compliance program as required under 29 CFR 1926.62 (e)(2)
5. Safety Plan: The Safety Plan must be on site at all times and is to include, but not be limited to, the following:

    a. Type, quantity and location of fire extinguishers.
    b. Lock-out/Tag-out Program and any other pertinent electrical information.
    c. Type of eye and ear protection.
    d. Location of emergency breakthrough point if different from the drawings.
    e. Type, quantity and location of first-aid kits.
    f. Times and usage of hard hats.
    g. Safety training afforded employees.
    h. Roof safety system to be used.
    i. Provisions for avoiding heat stress.
    j. Employee exposure assessment for lead.

6. Decontamination and Work Procedures: Submit project specific decontamination and work procedures that will be followed on this project.
7. Project Log: A Project Log will be maintained throughout the project by the Contractor. The log will contain notes concerning any accidents that may happen and any deviation from standard work procedures and any other pertinent project information. At project completion, the original of this log will be submitted to the Architect/Engineer as part of the permanent job file.
8. Daily Containment Log In/Out Form: The Daily Containment Log In/Out form will be kept on a clipboard in the clean room of each decontamination unit. The Contractor will ascertain that everyone who enters and leaves the containment will sign in/out. At project completion, the log will be copied and made part of the post submittal package.

C. Equipment and Material to be Utilized:

1. Material Safety Data Sheets:

    a. Submit a notarized statement documenting the Material Safety Data Sheets and Hazardous Communication Standard Training is complete and guarantee that all products used on site are complete for Material Safety Data Sheets and hazard communication requirements and that each employee has been trained in the Hazard Communication Standard.
    b. Material Safety Data Sheets for any product containing any kind of chemical the Contractor will be utilizing on the project will be on site at all times.
    c. Submit copies of all MSD Sheets directly to the General contractor and the owner as required for compliance with their respective Hazard Communication Programs.

D. Notification Requirements:

1. Insurance and Contract Security: Submit copies of all insurance policies or certificates of insurance and performance and payment bonds required under this contract.
2. Notifications: In accordance with 40 CFR 61.145 and 40 CFR 61.146 (Demolition/Renovation Notification Information Sheet), notification must be submitted by the Contractor to the Maine Department of Environmental Protection, Bureau of Solid Waste, State House Station #17, Augusta, Maine 04333, with a copy to the Architect/Engineer for review 15 days prior to the commencement of the work.
3. Landfill Approval Evidence: Submit written evidence to the Architect/Engineer that the landfill for disposal is approved for asbestos and or lead disposal respectively by the Department of Environmental Protection of the state in which the landfill is located.
4. Dry Removal Request: If dry removal is requested in the asbestos plan, submit copies of the approval received from the Maine Department of Environmental Protection. Submittals are to be received by the Architect/Engineer prior to any removal being done.

E. Personnel, Training, Medical, and Respiratory Fit Test Documentation.

1. Respirator Protection Program: A summary of the Contractor's Respiratory Protection Program as required by 29 CFR 1910.134 must be on site at all times.
2. Personnel Training Certificates, Medical Exams, Medical Questionnaires, and Respirator Fit Tests:

   a. Training Requirements: Submit to the Architect/Engineer certificates of training for each employee.

      1) Submit proof of training for all workers that will impact any asbestos roofing.
      2) Lead workers: All workers must receive training pursuant to the requirements of 29 CFR 1926.62, 29 CFR 1926.59,and 29 CFR 1926.21

   b. Medical Exams: Proof of medical exams as required by 29 CFR 1910.1001 and 29 CFR 1926,62 must be on site at all times.
   c. Medical Questionnaires: A notarized statement that medical questionnaires have been administered in accordance with 29 CFR 1910.1001 - Appendix D and 29 CFR 1926.58 - Appendix D must be on site at all times.
   d. Respirator Fit Tests: Proof of respirator fit testing for all employees to be employed on the project. Fit testing will be in accordance with 29 CFR 1910.1001 - Appendix C and 1926.58 - Appendix C and must be on site at all times.

1.8 SHOP DRAWINGS

A. Shop drawings prepared by the Contractor or his Subcontractors or suppliers for submission shall be signed and approved by the Contractor before submission. In particular, the Contractor shall ascertain that the drawings meet all requirements of the contract documents and conform to the conditions at the job site. Furthermore, the Contractor shall be fully responsible for observing the need for and making any changes. If the shop drawings show variations from contract drawings or specifications, whether because of standard shop practice or other reasons,

the Contractor will not be relieved of the responsibility for completing the work in full accordance with the contract documents even though such shop drawings are reviewed by the Architect/Engineer.

B. Contractor to determine and verify field construction criteria and conformance of submittal with requirements of contract documents.

C. Contractor to sign or initial each sheet of shop drawings to certify compliance with requirements of contract documents. Notify Architect/Engineer, in writing, at time of submittal of any deviations from requirements of the contract documents. The review of the submittals by the Architect/Engineer shall not be construed as a complete check but will only indicate the general method of construction and detailing is satisfactory. Review of such submittals will not relieve the Contractor of the responsibility for any error which may exist as the Contractor shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work.

D. Do not fabricate products or begin work which requires submittals until submittals are returned by the Architect/Engineer. All work shall be in conformance with reviewed shop drawings.

E. Shop drawings shall be drawn to scale and show all necessary dimensions and details. They shall be numbered consecutively, dated, and indicate the project name, the names of the Contractor and Subcontractor, the name and description of the equipment or articles shown, the manufacturer's name, the kinds, types, grades, thickness and finishes of materials, including all fittings. Marked-up copies of standard drawings showing typical conditions and details and indicating their specific application to the work will not be acceptable. Shop drawings shall be accompanied by a letter of transmittal identifying the items of work submitted. Shop drawings shall be submitted in accordance with the Submittal Index. The review of the shop drawings will be general and shall not relieve the Contractor from sole responsibility for errors or omissions of any sort. Review will not imply verification of required quantity of material, nor correctness of dimensions. Requests by the Architect/Engineer for changes and corrections on shop drawings shall not be construed as an order for extra work under the contract.

1.9 SUBMITTAL REQUIREMENT

A. Apply Contractor's stamp, signed or initialed certifying to review, verification of products, field dimensions and field construction criteria, and coordination of information with requirements of work and contract documents.

B. Coordinate submittals into logical groupings to facilitate interrelation of the several items.

1.10 SUBMITTAL INDEX

A. All of the following must be submitted in sextuplet (six sets) to the Architect/Engineer, if applicable, not less than fifteen (15) calendar days prior to the start of abatement.

1. Written abatement plan as specified in paragraph 1.7 (B) of this section.
2. Work Practices and Procedures:

a. Standard Operating Procedures

b. Historical data from previous projects if the Contractor is not planning on using a test containment (roofing and siding projects only)
c. Decontamination and Work Procedures

3. Notification Requirements:

a. DEP Notification
b. Landfill Approval Evidence

4. Personal Training and Certification: for all employees including the Asbestos designer, and independent asbestos air monitor.

a. Training Certificates
b. Evidence of training

1.11 SUBMITTAL INDEX AT COMPLETION OF PROJECT

A. The following must be submitted, to the Architect/Engineer if applicable, within ten (10) workdays of the completion of the abatement project in quadruplicate (4 sets).

1. Results of Personal Air Monitoring, including Air Sampling Pump Calibration Records.
2. Disposal Receipts, for Asbestos and Lead.
3. TCLP test reports.

1.12 ADDITIONAL SUBMITTALS

A. The following must be submitted, to the Architect/Engineer if applicable, within ten (10) workdays of receiving the letter of intent.

1. Cost breakdown and requisition for payment.
2. Any additional submittals shown under their respective sections.

1.13 AIR SAMPLING

A. The Contractor shall provide all required on site monitoring, sampling and laboratory services for area air monitoring, and all, visual inspections and independent air clearance sampling and analysis.

B. Air sampling shall be conducted in accordance with the AHERA Interim TEM Nonmandatory Analytical Method and the NIOSH Standard Analytical Method 7400 for the sampling and analysis of airborne asbestos fibers.

C. Flow Rate:

1. Area Samples (Phase Contrast Microscopy): The flow rate for background, in-progress and clearance samples should not be less than 0.5 liters/minute and must not exceed 16 liters/minute.

2. Personal Samples (Phase Contrast Microscopy): The flow rate for breathing zone samples must range between 0.5 liters/minute and 2.5 liters/minute.

D. Background samples may be collected prior to initiation of abatement activity in each area. A sufficient number of samples must be taken which are statistically unbiased and representative of airborne fiber concentrations throughout the asbestos-affected area. For multiple room containments, background samples must be collected in each room.

E. In-progress samples must be collected for each work shift. As a minimum, six hours of in-progress abatement work must be sampled. If the operation in a given shift is less in six hours, the entire duration must be sampled. In the event that background loading is excessive, use multiple cassettes and time weight over the sampling period.

F. Airborne fiber concentrations at no time shall exceed the Excursion Limit of 1.0 fibers/cc during any 30-minute period. Airborne fiber concentrations as a matter of good abatement practices, however, should never exceed the Permissible Exposure Limit (PEL) of 0.1 f/cc.

G. Area and Personal Sampling:

1. Air Sampling Pumps: Two types of pumps shall be used to sample airborne asbestos fibers.

   a. Personal samples shall be collected with a low flow pump which is capable of sampling at flow rates ranging from 0.5 liters/minute to 2.5 liters/minute. The pump is hung from the worker's belt and attached to a filter cassette positioned in the worker's breathing zone (within 9 inches of the mouth) by means of plastic tubing and lapel clip.
   b. Area samples shall be collected with a stationary high volume pump which is capable of sampling at flow rates ranging from 0.5 liters/minute to 16 liters/minute.
   c. Air sampling pumps must be calibrated before and after each use by means of a primary standard or by a secondary standard (e.g., rotameter) that has been calibrated against a primary standard within the last 30 days.
   d. Pumps must have a tag attached including the last calibration date and the initials of the technician performing the calibration.

2. Filters: Three types of filters can be used.

   a. Phase Contrast Microscopy: Cellulose ester with 0.8 to 1.2 micron pore size.
   b. Transmission Electron Microscopy: Polycarbonate with 0.4 micron pore size or cellulose ester with 0.8 micron pore size.

3. Cassettes and Blanks: A 3-piece, 25 mm open-faced cassette which contains a membrane filter, a support pad and two sealing caps is used for air sampling. A minimum of two blanks must always be submitted for analysis or 10 percent of total samples, whichever is greater.
4. Number of In-Progress Samples: Dependent on the size of the regulated area, the number of in-progress samples required varies. The number of samples specified below are intended as guidelines; however, the actual numbers may be increased or decreased based upon site constraints and the professional judgement of the Asbestos Air Monitor:

a. For Containments of 500 s.f. or Less:

1) A minimum of two samples inside.
2) Two samples outside of containment but within the extended regulated area located upwind and downwind of the containment.
3) One sample at a HEPA exhaust outlet.
4) One sample in the decon clean room.

b. For Containments Greater than 500 s.f.:

1) A minimum of three samples inside.
2) Two samples outside of containment but within the extended regulated area located upwind and downwind of the containment.
3) One sample at a HEPA exhaust outlet.
4) One sample in the decon clean room.

c. For outside removal by licensed Abatement Contractors performing roofing and siding abatement:

1) No area monitoring is required provided the personal air monitoring results do not exceed the OSHA PEL Standard of 0.1 f/cc as based upon an 8-hour TWA.

5. Number of Clearance and Final Clearance Samples for Roof Containments (Test Containments): Dependent of the size of the regulated area, the number of clearance samples varies. Passive sampling procedures for clearance will be used for all roof containments. The number of samples specified below are intended as required guidelines; however, the actual number may be increased or decreased based upon site constraints and the professional judgement of the Asbestos Air Monitor:

a. In-progress samples, as described in 4.a.1 and 4.b.1, may be utilized for clearance samples if the fiber concentration is 0.10 f/cc or less.
b. If the fiber concentration is above 0.10 f/cc, conduct additional sampling, as described in 4.a.1 and 4.b.1, to achieve a fiber concentration of 0.10 f/cc or less.
c. In cases where fiber concentrations at background level are above 0.10 f/cc, the acceptable clearance fiber concentration will be at background or less.
d. Fiber Density and Sample Volume: The NIOSH 7400 Method has a validation range of 100 f/mm-sq to 1300 f/mm-sq of filter area (or 78.5 fibers/100 fields to 1014 fibers/100 fields). The State has chosen 78.5 fibers counted in 100 fields (100 fibers/mm-sq) as the recommended acceptable fiber density or loading for air samples. In the absence of this loading on the filter, a sufficient air volume must be collected to verify that the recommended fiber density requirement could not be met. The calculation for required sample volume (RSV) at 0.10 fibers/cc) is as follows:

RSV (in liters) = [(78.5 fibers/100 fields)x(385 mm-sq/filter)]
[(0.10 fibers/cc)x(1000 cc/1)x(0.00785 mm-sq)]
= 3850 liters

e. For outside removal by licensed Abatement Contractors performing roofing or siding abatement, clearance sampling is not required; however, a visual inspection by an independent Asbestos Air Monitor is required as per Maine DEP Asbestos Management Regulations Chapter 425, Section 9(A)(16)(b)(ii).

6. Personal Sampling:

a. Personal samples shall be collected and analyzed in accordance with the OSHA reference method (ORM). See U.S. Department of Labor: Occupational Safety and Health Administration; Occupational Exposure to Asbestos; Title 29 CFR 1910.1001, "General Industry Standard," and Title 29 CFR 1926.58, "Construction Standard," by the Asbestos Abatement Contractor.

1) Personal samples, representative of worker's exposure, must be taken during each shift. As a minimum, 25 percent of the work crew must be sampled. Documentation for personal sampling must be available at the job site for review. Collection of personal samples is the responsibility of the Asbestos Abatement Contractor.

b. Records shall be maintained at the job site which include all personal air sampling data. Documentation for personal samples must contain the following information and be recorded as part of the documentation for each sample collected:

1) Sample number
2) Name and Social Security Number
3) On and off time of sample
4) Sample duration
5) Pre- and post-flow rate
6) Total volume
7) Fiber count
8) Fiber density
9) Fiber concentration
10) Limit of quantization
11) Limit of detection
12) Laboratory coefficient of variation (CV)
13) Job name and number set by the Division
14) Date collected and date analyzed
15) Sample collector's and analyst's signature
16) Name of Analytical Laboratory

c. Personnel performing "personal sampling" must successfully complete a course in air sampling procedures.

d. Flow rates must be checked before and after each sampling period. Rotameters used for this purpose must be calibrated monthly against a primary standard.

H. An asbestos abatement work area may not be reoccupied until

1. Clearance air monitoring samples are collected by an independent Asbestos Air Monitor using the air sampling methods prescribed by this section at a minimum.

a. Air Clearance Sampling - Phase Contrast Microscopy:

1) An independent Asbestos Air Monitor determines that the average total fiber count of the samples collected in the work area is equal to or less than 0.010 f/cc (fibers per cubic centimeter) of air as analyzed by phase contrast microscopy.
2) The minimum number of air clearance samples were collected as follows:

   a) Two samples for activities that contain less than 100 combined linear and square feet of ACM.
   b) Three samples for activities that contain more than 100 but less than 1,000 combined linear and square feet of ACM.
   c) Five samples for activities greater than 1,000 combined linear and square feet of ACM.

3) Air clearance samples must contain at least 2452 liters of air, and sampling flow rates must not exceed 16 liters of air per minute.
4) Air samples must be collected utilizing aggressive techniques, that are consistent with 40 CFR, Part 763, Subpart E (effective date December 14, 1987)..
5) In the event that the inside area clearance samples fail (> .010 f/cc), the Contractor shall.

   a) Reclean the area at no cost to the Owner.
   b) Resample by Transmission Electron Microscopy to obtain a clearance as per the Asbestos- Containing Materials in Schools rule 40 CFR Part 763 (effective October 30,1987); or
   c) Exclude potentially contaminated make up air and resample

b. Aggressive Air Clearance Sampling:

1) Blow Down: Direct the exhaust from appropriately sized leaf blower against all containment walls, ceilings, and other surfaces to render any remaining fibers airborne. Five minutes per 1,000 sq. ft. of floor area is required. Decontaminate (or discard) the leaf blower after each use.
2) Air Movement: Place a 20-inch propeller fan in the center of the containment and ensure it remains activated during the sampling period. One fan should be used for each 10,000 cubic feet.

c. Air Sampling: Collect the requisite number of air samples the required time to ensure adequate sample volumes.
d. Completion of Sampling: Turn off the pump and then the fan when sampling is complete, and submit the cassette for analysis.
e. Sampling Restriction: Aggressive air sampling shall be performed at all times for clearance of the regulated area.

PART 2 - 2.PRODUCTS

2.1 MATERIALS

A. Polyethylene Sheeting for walls and stationary objects shall be a minimum of 4-mil thick. For floors and all other uses, sheeting of at least 6-mil thick shall be used in widths selected to minimize the frequency of joints.

B. Polyethylene Sheeting utilized for the worker decontamination enclosure shall be opaque white or black in color.

C. Reinforced Polyethylene Sheeting: Where the exterior plastic sheet is the only separation between the work area and the immediate occupied building area, provide translucent, nylon reinforced, laminated, polyethylene film. Provide largest size possible to minimize seams, 4- or 6-mil thick, frosted or black.

D. Acetate, clear size 36" x 36".

E. Disposal Bags shall be of 6-mil polyethylene, pre-printed with labels as required by OSHA. Label specifications shall comply with 29 CFR 1910.1001 and 1926.58.

F. Disposal Drums shall be metal or fiberboard with locking ring tops.

G. Warning Signs and Labels: Provide warning signs at all approaches to asbestos control areas containing concentrations of airborne asbestos fibers. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos. Labels and signs will comply with 29 CFR 1910.1001 and 1926.58.

1. Warning Sign: Vertical format conforming to 29 CFR 1910.145 and 1926.58 shall be a minimum size of 20" by 14" displaying the following legend in the lower panel:

DANGER	1" Sans Serif, Gothic or Block
ASBESTOS	1" Sans Serif, Gothic or Block
CANCER AND LUNG DISEASE HAZARD	3/4" Sans Serif, Gothic or Block
AUTHORIZED PERSONNEL ONLY	1/4" Gothic
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA	1/4" Gothic

Spacing between lines shall be at least equal to the height of the upper of any two lines.

2. Labels: Provide labels of sufficient size to be clearly legible, displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

3. DO NOT ENTER signs - minimum size 6" x 12" with 2" letters - red on white shall be furnished.
4. Barrier Tape: Red or Yellow with warning - "DANGER - ASBESTOS - DO NOT ENTER."

H. Surfactant: (Wetting agent) shall be a 50/50 mixture of polyoxyethylene ether and polyoxyethylene ester, or equivalent, mixed in a proportion of 1 fluid ounce to 5 gallons of water or as specified by the manufacturer. (An equivalent surfactant shall be understood to mean a material with a surface tension of 29 dynes/cm as tested in its properly mixed concentration, using ASTM method D1331-56 "Surface and Interfacial Tension of Solutions of Surface Active Agents.") Where the work area temperature may cause freezing of the amended water solution, the addition of ethylene glycol in amounts sufficient to prevent freezing is permitted.

I. Towels will be disposable type and minimum size of 24" x 36" per towel.

J. Spray Adhesive shall not be noxious or toxic to workers or subsequent users of the area. Spray adhesive must not contain methylene chloride.

K. Make-up Air Filters: Filter to be 24" x 24" equal to Farr 30/30 Class II, mounted in a Type 8 Universal Holding Frame (#79473-004).

L. Duct Tape: Provide duct tape in 2" or 3" widths with an adhesive which is formulated to aggressively stick to polyethylene sheet.

M. Lumber: Provide kiln dried 1" x 3" strapping, 2" x 3" and/or 2" x 4" framing lumber of any grade or species.

N. Foam Sealant: Provide fire stop foam sealant in aerosol cans which is specifically formulated to expand, solidify, and seal penetrations and openings.

O. Extension Cords: Extension cords utilized in the containment will be a minimum 12/2 wire with ground, neoprene or rubber covered. Extension cords will be utilized in accordance with the National Electrical Code.

P. Physical Barrier: 3/8" plywood, emergency exit door, surface mounted bolt-lock, acetate window, hasp, staple and padlock.

2.2 GENERAL EQUIPMENT

A. Portable Exhaust Ventilation Unit Equipped with HEPA Filters shall be in accordance with ANSI Z9.2. Equip with absolute (HEPA) filters. There must be sufficient equipment to maintain a minimum pressure differential of minus 0.02 inch of water column relative to adjacent, non-abatement areas. Filters on vacuums and exhaust equipment shall conform to ANSI Z9.2.

The Portable Exhaust Ventilation Unit equipped with HEPA filters shall have the following:

1. Magnehelic gauge to monitor the unit's air pressure difference across the filters.
2. Audible alarm with or without flashing red light for unit shutdown.
3. A yellow warning light to indicate a decrease in air flow due to filter loading.

B. Negative Pressure Recorder with paper printout to record negative pressure. Instrument to have an audible alarm. Printout range must be from .00 to .05.

C. Respirators: Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

1. Powered Air Purifying Respirator (PAPR) with high-efficiency filter and full facepiece with rechargeable batteries.
2. Type C Respirators with an air supply system that will provide Grade D breathing air in accordance with OSHA 29 CFR 1910.134 and ANSI 286.1-1973 Commodity Specification for Air. The compressed air systems shall have a receiver of adequate capacity to allow escape of all respirator wearers from contaminated areas in the event of compressor failure. Compressors must meet the requirements of 29 CFR 1910.134(d). Compressor to have alarms that indicate a high temperature and carbon monoxide.
3. Asbestos-rated respirator, North 7700 or equivalent, using NIOSH rated filters for asbestos North 7500-8 or approved equal.

D. Protective Clothing: Provide workers and authorized visitors exposed to airborne concentrations of asbestos fibers with disposable protective whole body clothing to include underwear, head coverings, gloves, and foot coverings. Sleeves and foot coverings shall be made secure at the ankles and wrists by the use of tape. Protective clothing shall be provided to all workers and authorized visitors in sizes adequate to accommodate movement without tearing.

E. Working Clothing: Non-skid footwear shall be provided to all abatement workers.

F. Eye Protection: Provide goggles in accordance with ANSI Z87.1 to personnel engaged in certain asbestos operations when a full face respirator is not required.

G. Electrical: Provide ground-fault circuit interrupters for all electrical equipment.

2.3 REMOVAL EQUIPMENT

A. A sufficient supply of scaffolds, ladders, lifts and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be provided as needed.

B. Sprayers with pumps capable of providing 500 pounds per square inch (psi) at the nozzle tip at a flow rate of 2 gallons per minute for spraying amended water.

C. Rubber dustpans and rubber squeegees shall be provided for cleanup.

D. Brushes utilized for removing loose asbestos-containing building material shall have nylon or fiber bristles, not metal.

E. A sufficient supply of HEPA-filtered vacuum systems shall be available during cleanup.

2.4 GLOVE BAG

A. Glove Bag: Zipper type - Safe-T-Strip, Profo Type or approved equal.

B. HEPA Vacuum: High-efficiency particulate HAKO Model C80315 or approved equal.

C. HEPA Exhaust Unit: Exhaust unit equipped with absolute (HEPA) filters, exhausted to outside the building to provide six (6) air changes an hour.

D. Respirator: Dual cartridge asbestos-rated respirator, Norton 7700 or equivalent, using NIOSH rated filters for asbestos, Norton 7500-8 or approved equal.

E. Disposable Clothing: Tyvek disposable coveralls or equivalent; hoods and booties (separate or as part of coverall).

F. Asbestos Disposal Bags: 6-mil thickness minimum with asbestos warning printed or pasted on bag.

G. Water Pump Sprayer: One to five-gallon capacity.

H. Surfactant: A wetting agent to add to water to increase penetrating ability. Water with surfactant added is called "amended water." Aqua-Gro or equivalent.

I. Duct Tape: Preferably 3" width.

J. Double Sided Tape: Preferably 2" to 1" width, #4962 as manufactured by the 3M Company or approved equal. Tape to be adhesive-backed.

K. Wettable Cloth: A glue-impregnated cloth used in sealing exposed insulation left in place. H.R. Allen R-2550 or equivalent.

L. Pipe Insulation End Caps: Alternative to wettable cloth.

M. Spray Glue: Used to seal exposed remaining asbestos insulation if wettable cloth or end caps are unavailable. Asplundh Spray Adhesive or equivalent.

N. Barrier Tape: Red or Yellow with warning - "DANGER - ASBESTOS - DO NOT ENTER."

O. Warning Signs: White with black and red lettering stating asbestos dust may be present and to wear appropriate protection.

P. Bone Saw (Flexi-Saw): Disposable or reusable. For cutting any thickness of insulation, but primarily where razor knife or hook knife is too short.

Q. Razor Knife: Disposable or reusable.

R. Hook Knife: Disposable or reusable.

S. Damp Rag: Used to wipe metal pipe clean of asbestos particles.

T. Wire Snips: Used to cut wire or metal bands used to hold insulation to pipe.

U. Metal or Fiber Drum: 35- to 55-gallon capacity drum with sealable top, marked to indicate asbestos contents.

V. Designated Shower Area: Either portable or existing in building in case of accidental contamination.

2.5 ENCAPSULANTS

A. Encapsulation materials shall be as follows:

1. Wettable Cloth: Fiber lock Lag Cloth or approved equal.
2. Spray Type Encapsulant: Combination of Penetrating - Bridging - Fiberlock Asbestos Binding Compound Concentrate or approved equal.
3. Bridging Encapsulant: Mastic formulation to provide a tough, non-porous membrane over acoustical plasters, cementitious fireproofings, and all thermal insulations. Maintain flexibility. Penetrate up to 3/16". American Coatings-Cable Coating 2B or approved equal.
4. Penetrating Encapsulant: One component. Imparts an elastic-like resiliency to treated substrates with a durable and impact resistant surface. American Coatings Cable Coating 22P or approved equal.
5. Soil Encapsulant: Penetrates into the top layer of asbestos-contaminated soil, binds asbestos fibers in place, and generates a hard, rigidly sealed surface. American Coatings-Cable Coating Earth-Kote Process or approved equal.
6. High Temperature Sealant: High temperature thermal sealant to permanently seal any remaining fibers in place. American Coatings FNE or approved equal.

PART 3 - EXECUTION

3.1 WORK SEQUENCE AND SPECIAL INSTRUCTIONS FOR INTERIOR ABATEMENT

A. INTENTION

1. Nothing in this section shall supercede the phasing or coordination sections of this manual or phasing and scheduling by the General Contractor.
2. This project includes the design and removal of the asbestos containing building materials, as follows:

    a. Edge felts on the drill hall roof contain asbestos. All roof edge felts must be removed in accordance with the latest OSHA and DEP regulations.

3. This project includes the removal and or preparations of lead coated surfaces as required on the Roof framing Plans. The following surfaces have been identified by a lead survey conducted by a state licensed inspector to contain lead coated surfaces.

    a. All steel columns and steel girder members tested greater than 0.02 mg/Ft^2 by XRF. (Any XRF reading above 0.02 mg/Ft^2 should be considered as containing lead based substances.) These members will require removal of lead coatings to facilitate the welding of new steel onto the existing and to facilitate the cutting and removal of some members.
    b. The contractor shall be responsible to coordinate with all trades to ascertain the locations requiring removal of lead coatings to facilitate the renovations.

B. SPECIAL INSTRUCTIONS

1. Submittals:

a. Submit cost breakdown for Requisition for Payment as required by the General Contractor.
b. Submit Asbestos design by a licensed Asbestos Designer. Include designers License and training certificates.
c. Submit Lead design by a licensed Lead designer. Include designers License and training certificates.

2. Applicable Regulations:

a. Federal OSHA Regulations apply to this project.
b. State DEP Regulations apply to this project.

3. Electrical:

a. All circuits individually GFI-Protected.
b. Weatherproof enclosure NEMA 3 (raintight) and receptacle covers.
c. Durable 16 gauge steel construction.
d. Each interior and exterior power supply board shall have one (1) 20-amp circuit for the Asbestos Air Monitor to perform air monitoring and clearance air monitoring without power interruptions.
e. Power Source: Temporary power shall be provided as be specified under Division 1.

4. Site Specific Work Practices:

a. No abated surface shall receive lockdown, or encapsulant prior to air clearances.
b. DEP notification is required by the Contractor. The contractor may request waivers as required to reduce poly containment as allowed in the DEP chapter 425 regulations.
c. The Contractor shall use P.P.E. during all abatement.
d. The Contractor shall be responsible for personal air monitoring during all abatement.
e. The Contractor shall be responsible to provide and pay for a visual inspection and Air Clearance by an independent Asbestos Air Monitor as required by Maine DEP Asbestos Management Regulations. A signed statement shall be completed by the Asbestos Air Monitor for each visual inspection and Air Clearance with the following information:

1) 1. Description of area of visual inspection/clearance.
2) 2. Name, date, and Maine DEP certificate number of Air Monitor.
3) 3 Signed statement that visual inspection/Air Clearance was performed and the results, with an indication of the meaning of the results(passed or failed).

5. Make-Up Air Filters shall be securely framed and have a poly flap that extends a minimum of four inches outside filter. Filters will be installed only on true vertical surfaces or a surface that leans outward at the top from inside the containment. This procedure will allow the flap to have a positive seal upon loss of negative pressure.

a. Temporary Lighting:

1) Provide a well lit workplace during both removal and inspections.
2) Comply with OSHA regulations 1926.405(a)(2) Wiring Methods - Temporary Wiring and 1926.405(g) Flexible Cords and Cables.
3) Acceptance of Work Area Prior to Air Clearance: Clean will be determined by ASTM E1368-90.
4) Equipment and Staging: The Contractor shall be responsible for any and all tools, equipment and staging which is required for access to the removal area.

C. ASBESTOS WORK SEQUENCE AND PERFORMANCE

1. Work Sequence minimum requirements:

a. Install asbestos control barrier rope and "keep out" signs as required. Maintain this barrier throughout each phase.
b. Install physical barriers where required.
c. Install critical barriers at all windows, doors, and wall penetrations and over HVAC duct and equipment. When working in areas with telephone equipment and/or motors to remain in place, maintain ventilation via filters, ducts or chases as required.
d. Install negative air machines. Install temporary plywood panels at window openings as required for security of containment.
e. Install containment as require to reduce work area to areas with asbestos containing materials.
f. Install and maintain negative pressure recorder.
g. Construct personal decontamination/waste transfer.
h. Establish negative air differential of 0.02" of water. Add additional HEPA units if required.
i. Removal of asbestos-containing building materials:

1) Begin a systematic removal of asbestos-containing building materials using proper abatement methods.
2) Fine clean all surfaces asbestos-containing building materials were removed from.
3) Wet wipe all containment surfaces with a soap and water solution.
4) Visual inspection by an independent Asbestos Air Monitor.
5) If visual inspection by independent Asbestos Air Monitor passes, the air monitor may start clearance air monitoring, following part 1.13 of this section.
6) If air clearance samples pass, then tear down and turn area over to the other trades.
7) If the visual inspection or the air clearance samples fail, reclean and retest until clearance criteria is met.

3.2 WORK PRACTICES

A. General Provisions: Asbestos abatement shall comply with work practice requirements set forth in the Department of Environmental Protection Rules and Regulations and these specifications.

1. All asbestos abatement activity shall be performed only by those persons who have been duly licensed or certified to perform such work in accordance with the requirements of the Maine Department of Environmental Protection Regulations.
2. The Asbestos Abatement Contractor shall maintain the required information for each asbestos abatement project required by the Department of Environmental Protection Laws, Rules and Regulations, Paragraph 9A4.
3. All Lead abatement activity shall be performed only by those persons who have been duly licensed or certified to perform such work in accordance with the requirements of the Maine Department of Environmental Protection Regulations and or OSHA regulations 29 CFR Part 1926.62

3.3 WORKER PROTECTIONS

A. General:

1. All asbestos abatement work will be performed in accordance with 29 CFR 1910.1001, 29 CFR 1926.58, and/ or 29 CFR 1926.62 and as specified herein. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, or drinking shall not be permitted in the asbestos or lead control area. Personnel of other trades not engaged in the abatement of asbestos or lead shall not be allowed in the work area unless all the personnel protection provisions of this specification are complied with by the trade personnel.
2. Engineering controls will be used to minimize the airborne fiber concentration within the work area. HEPA-filtered exhaust units will be used to maintain a minimum negative pressure of .02 inches of water within the work area. A combination of personal protective equipment and work practices will also be used to further reduce employee exposure to asbestos fibers and or lead dust.
3. Provide all authorized visitors with protective clothing, headgear, eye protection, footwear, and hard hats as in the procedures described herein and afford them the use of all facilities to hold them free of contamination of asbestos fibers and or lead dust.
4. Provide and post in the clean room, the decontamination and work procedures to be followed by workers, as well as the results of the personal air monitoring.

B. Personnel Protection:

a. The employer shall select and provide at no cost to the employee respirators which will provide adequate protection to the employee as specified by Section 1910.1001(g) Table D-1 and Section 1926.58(h) Table D-4. and 29 CFR 1926.62
b. Respiratory protection shall be worn by all persons potentially exposed to asbestos from the initiation of the asbestos abatement project until all areas have been given clearance. Clearance shall be obtained by visual inspection and air monitoring conducted by the Asbestos Air Monitor.
c. Respirators for Handling Asbestos: Until it is established that the average airborne concentrations of asbestos the employees will confront will not exceed 100 times the permissible exposure limits, powered air purifying respirators or Type C (continuous flow or pressure demand) supplied air respirators will be used.

1) Once the exposure limits have been established, the respirators presented in 29 CFR 1910.1001 that afford adequate protection at such upper concentrations of airborne asbestos fibers may be used.

2) The filters provided for both the cartridge respirators and the PAPR's shall be HEPA filters. The Contractor shall provide each worker with a new set of filters at the beginning or each shift during each day of asbestos removal including final cleaning. For each PAPR, the Contractor shall have two (2) fully charged batteries at the beginning of each shift; one battery shall be used for the first half of the shift, the other for the second half of the shift.

C. Protective Clothing:

1. Provide to all workers, foremen, and superintendents protective disposable clothing consisting of underwear, full body coveralls, head covers, gloves and 18" high boot type covers and reusable footwear.
2. Provide eye protection and hard hats as required by job conditions and safety regulations.
3. Reusable footwear, hard hats and eye protection devices shall be left in the "contaminated equipment room" until the end of the asbestos abatement work.
4. Upon completion of abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from equipment and access area.
5. All disposable protective clothing shall be discarded and disposed of as contaminated waste every time the wearer exits from the work space to the outside through the decontamination facilities.
6. The color of the disposable clothing worn outside the work area shall be a different color than the disposable clothing worn inside the work area.
7. The last name of the worker will be printed in plain large letters or a large number with a cross reference sheet in the clean room on the back of the protective clothing with a magic marker type pen.

D. Decontamination Procedures:

1. Each worker and authorized visitor without exception shall upon entering the job site remove all under and outer street clothes in the clean change room and put on a NIOSH approved respirator with new filters and clean, disposable protective clothing before entering the equipment room or the work area.
2. Each time he/she leaves the work area, each worker and authorized visitor shall:

   a. Vacuum gross contamination from clothing before leaving the work area.
   b. Proceed to the equipment room and remove all clothing except respirator.
   c. Still wearing the respirator, proceed naked to the showers.
   d. Clean the outside of the respirator with soap and water while showering.
   e. Remove filters and wet them and dispose of filters in the container provided for the purpose.
   f. Wash and rinse the inside of the respirator. After showering, dry off with disposable towels.

3. Following showering and drying off, each worker and authorized visitor shall proceed directly to the clean change room and dress in street clothes at the end of each day's work or before eating, smoking, or drinking. Before re-entering the work area from the clean

change room, each worker and authorized visitor shall put on a clean respirator with new filters and shall dress in clean, disposable protective clothing except that worker intending to re-wear protective clothing stored in the equipment room shall enter the equipment room wearing only respirators.

4. Contaminated reusable work footwear shall be stored in the equipment room when not in use in the work area. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from equipment and access areas. Store contaminated protective clothing in the equipment room for reuse or place in receptacles for disposal with other asbestos-contaminated materials.
5. Workers removing waste containers from the equipment contamination enclosure shall enter the holding area from outside wearing a respirator and dressed in clean disposable coveralls. No worker shall use this system as a means to leave or enter the washroom or the work area.

3.4 FIRE PROTECTION

A. Automatic sprinkler control valves shall remain locked-open during the entire asbestos abatement project.

B. In the event that the valves must be closed, prior written approval from the Facility Representative shall be attained. When sprinkler control valves are shut during the work shift, they should be reopened at the end of the shift so that the fire protection system is activated during all non-working times. Documentation of the opening and closing of all valves shall be provided in the Project Log.

C. Fire extinguishers shall be provided inside the enclosed work area. Type and quantity to be defined in the Safety Plan.

D. Fire extinguishers shall be provided outside the enclosed work area in storage areas.

E. An air horn shall be provided and hung by each fire extinguisher.

F. Prior to project start-up, (1) the workers shall be trained on the safe use and handling of fire extinguishers, (2) informed of the locations of all fire protection equipment, (3) the location(s) of the sprinkler control valves, and (4) documentation of the above shall be recorded in the Project Log.

G. Prior to the performance of any cutting or welding, the supervisor shall be notified, a fire watch shall be stationed and provided with a fire extinguisher, and appropriate respirators shall be donned by all involved personnel.

3.5 WORK PREPARATION

A. Protection of Existing Work to Remain: Perform demolition work without damage or contamination of adjacent areas. Where such work is damaged or contaminated, it shall be restored to its original condition.

B. Electrical:

1. All electrical work will be in conformance with the National Electrical Code.
2. Electrical Testing by Contractor:

    a. The Contractor must notify the Owner, in writing, the name of the person performing the tests, date and time of tests and model number of equipment being used.
    b. Prior to the installation of poly in any work area, testing of all electrical apparatus will be conducted by the Contractor. Testing shall consist of the polarity of the circuits and a test to determine if any circuits are live in the project area. All electrical equipment (i.e., motors, conduit, Greenfield, etc.) in the containment will be surface tested for ground

        1) Extension Cords: Extension cords utilized in the containment will be a minimum 12/2 wire with ground, neoprene or rubber covered. Extension cords will be utilized in accordance with the National Electrical Code.

C. Work Areas:

1. The Asbestos Lead Foreman will establish designated limits for the asbestos/ lead control area. With the use of rope for the asbestos/lead control area and barrier tape or other continuous barriers for the regulated area, maintain these and all other requirements for asbestos control areas.
2. Isolate the entire abatement area to anybody other than trained personnel and authorized visitors. Erect signs around the perimeter in accordance with EPA, OSHA and this specification. Maintain a log of all people entering and exiting the workplace.
3. Where designated on the drawings, separate parts of the building required to remain in use from parts of the building that will undergo asbestos abatement by means of airtight barriers constructed as follows:

    a. Construct physical barrier as required by the asbestos/ lead designer.
    b. Cover one side of the partition with a single layer of plastic sheet with joints staggered and sealed with tape. Edges of partition at floor, walls and ceiling shall be caulked airtight.

4. Signs shall be posted at any location and approaches to a location where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosure barriers. DO NOT ENTER signs will also be posted.
5. Shut down and lock out all heating, ventilating and air conditioning system (HVAC) components that are in, supply or pass through the work area. (Note: Interiors of existing ductwork may require decontamination.) Double seal all intake and exhaust vents in the work area with successive layers of tape and 6-mil polyethylene. Also seal any seams in system components that pass through the work area. Remove all HVAC system filters and place in labeled 6-mil polyethylene bags for staging and eventual disposal as asbestos-contaminated waste.
6. Seal off all openings in the walls, ceiling and floor from inside the work area leading to outside areas by filling these openings with fiberglass then covering them with 6-mil polyethylene and duct tape.

7. When precleaning is not required, the Asbestos Air Monitor will inspect and approve each area prior to the sealing of all windows, doorways, elevator openings, corridor entrances, drains, ducts, grilles, grates, diffusers, skylights, and any other openings between the work area and uncontaminated area outside of the work area (including the outside of the building, tunnels and crawl spaces) (critical barrier) with new 6-mil polyethylene sheeting and tape.
8. Special attention is to be given the metal ducts, metal heater boxes and intake areas to ascertain that these are completely sealed with either polyethylene or some other means acceptable to the Engineer.
9. Preclean the work area by removing any loose, gross debris.
10. Preclean all fixed and movable objects in the work area using HEPA- filtered vacuums and/or wet cleaning techniques as appropriate.

    a. Careful attention must be paid to machinery behind grilles or gratings where access may be difficult but contamination significant.
    b. Also pay particular attention to wall, floor and ceiling penetrations behind fixed items.
    c. After precleaning, enclose fixed objects in 4-mil polyethylene sheeting and seal securely in place with tape.
    d. Where carpet is to remain and is scheduled on the drawings, such carpeting shall be thoroughly cleaned using HEPA vacuum equipment.
    e. After precleaning, all furniture and equipment should be removed from the area if at all possible.
    f. All electrical items and the communications systems shall receive special attention to avoid water/moisture damage. All electrical equipment shall be completely covered with two (2) layers of plastic (6-mil minimum), each securely taped and sealed. All telephones which cannot be removed to storage shall be wrapped in plastic bags. In addition, these items shall be carefully monitored during the course of the work for penetration of the seal by water. If water penetration is observed, reseal as required.
    g. The Contractor is permitted one of two options with respect to lighting fixtures. The fixtures may be removed by a licensed electrician or the fixtures may remain in place during construction provided that each is wrapped in polyethylene sheeting on the top surface and over all openings. If fixtures are removed during construction, they shall be cleaned of all asbestos and dust, wrapped in polyethylene and stored in the designated storage area.

3.6 ISOLATION OF THE WORK AREA

A. Critical Barrier:

1. For all asbestos abatement projects which are performed in an occupied facility, large openings such as open doorways, elevator doors, and passageways shall be first sealed as a critical barrier. The critical barrier shall constitute the outermost boundary of the asbestos abatement project work area. Critical barriers shall be constructed in such a manner as to prevent unauthorized entry to the work area. The work area shall be isolated by sealing all openings including, but not limited to, windows, doors, ventilation openings, drains, grilles, and grates with fiber-tight sheeting that is at least 6 mils thick (minimum) plastic sheeting and duct tape or the equivalent adhesive material to prevent

the passage of asbestos fibers. All cracks, seams and openings in critical barriers shall be caulked or otherwise sealed, so as to prevent the movement of asbestos fibers out of the work area. The adequacy of the containment design shall include consideration for special precautions to ensure the integrity of the critical barrier during all phases of the asbestos abatement project.

B. Establishing Containment Barriers:

1. Floor and wall surfaces shall be covered with fiber-tight sheeting. All seams and joints shall be sealed with duct tape or equivalent adhesive material. Floor covering shall consist of at least two layers of 6-mil thick fiber-tight sheeting and must cover at least the bottom 12 inches of the adjoining wall. Wall covering shall consist of a minimum of two (2) layers of 4-mil thick fiber-tight sheeting which shall overlap the floor covering to prevent leaks. There shall be no seams in the sheeting where the wall meets the floor.
Note: Walls and ceilings that are non-porous and will not be damaged by water, surfactant, encapsulant do not necessarily need protection. They can be decontaminated using HEPA vacuums and wet cleaning techniques. Walls with mortar joints are considered porous, i.e., brick, concrete block, stone and glazed block tile.

2. Exceptions to the covering of floor, wall, and fixed object surfaces prior to starting an asbestos abatement project.

   a. Where the glove-bag technique is to be used for the entire project, and a critical barrier has been established around the work area, and the work area can be maintained under negative pressure with a HEPA- filtered negative air machine. In this instance, the critical barrier shall be considered a containment barrier for the purpose of compliance with Section 9(a)(4)(e) of the DEP Regulations.
   b. Where non-porous and impervious material covers the floors, this material should be free from mortar joints, cracks, fissures, holes, or drain openings in which asbestos fibers may become trapped, lodged, or escape.
   c. Where the physical dimensions of the work area are sufficiently small that the application of fiber-tight sheeting will likely result in disturbance of ACBM resulting in asbestos fiber release. Such areas may include, but are not limited to, utility closets, crawl spaces, etc.

3. Acetate Windows 36" x 36" will be installed in a location or locations shown on the drawings. Location of window or windows will be shown on the asbestos removal plan. It is the intent that the work area be completely visible from the outside.
4. Emergency Breakthrough Points on the polyethylene will be clearly marked and always be accessible. Arrows to emergency exits will be made on the polyethylene and be placed 2' off the floor.
5. Maintain emergency and fire exits from the work area, or establish alternative exits satisfactory to fire officials.
6. Physical Barrier will be a minimum of 3/8" plywood and heights as shown on the drawings, equipped with an emergency exit door of an approximate size of 3'-0" wide by 6'-3" high. There shall be a surface mounted bolt-lock on the containment area side and the door shall swing out of the asbestos work area. In the door will be a hinged opening with an acetate window. A hasp, staple and padlock will be installed to maintain security in the door.

3.7 DECONTAMINATION FACILITIES

A. For each abatement area, provide decontamination facilities where shown on the drawings. The decontamination facilities shall include a Personnel Decontamination Facility for workers and visitors and when designated on the drawings, a Waste Loadout System.

B. The Personnel Decontamination Facility shall consist of a three-room series as follows: clean room, shower room, followed by a dirty/equipment room leading to the work area.

C. The clean room shall have sufficient space for storage of the worker's street clothes, towels, and other non-contaminated items. Joint use of this space for other functions such as offices, storage of equipment, materials, or tools shall be prohibited. Space heating or air conditioning will be in accordance with the drawings or conditions.

D. A shower room with two (2) curtained doorways. Plastic on shower room and adjoining equipment and clean rooms shall be non-transparent. Showers shall be provided and used at all asbestos removal operations. Factory made shower head producing a spray of water which can be adjusted to spray size and intensity. Feed shower with water mixed from hot and cold supply lines. Arrange so that control of water temperature, flow rate, and shut off is from inside shower without outside aid. Shower stall to have a soap dish. The shower drain will be equipped with a 3 micron filter.

E. The shower room shall contain at least one (1) shower with hot and cold or warm water. Careful attention shall be paid to the shower enclosure to ensure against leaking of any kind. Ensure a supply of soap and disposable towels at all times in the shower room. No electrical circuitry shall be located in the shower room.

F. When designated on the drawings, provide or construct a Waste Loadout System consisting of two (2) totally enclosed chambers as follows:

1. A bag wash area consisting of a water collection basin and/or collection and water filtration system, water hose and spray applicator.
2. A bagging area consisting of an airlock with a curtained doorway to the bag wash area and a curtained doorway to an uncontaminated area.

3.8 EQUIPMENT DECONTAMINATION

A. No equipment, supplies, or materials (except properly containerized waste material) shall be removed from an asbestos abatement project work area (including a containment barrier) unless such equipment, supplies and materials have been thoroughly decontaminated and cleaned free of visible debris. Where the configuration of the equipment, supplies, materials to include cloth-canvas type shoes is such that decontamination is not feasible, the object shall be thoroughly wrapped in a minimum of two (2) layers of 6-mil fiber-tight sheeting with all joints, seams and overlaps sealed with tape; or containerized in a metal, plastic or fiber drum with a locking lid.
Examples include, but are not limited to, air filtration or HEPA vacuuming equipment, and wood or other materials used inside containment barrier to be transported to another containment barrier for reuse. Equipment, supplies, or materials that have been wrapped for transport

and storage shall be unwrapped only within a containment barrier under negative pressure. For this purpose, the critical barrier shall be considered the containment barrier.

B. HEPA vacuums shall be emptied of collected asbestos waste prior to its removal from the containment barrier. HEPA vacuums used as part of a glove bag removal shall be emptied within a containment barrier under negative pressure. This containment barrier need not be at the work site.

C. Air filtration devices shall have used pre-filters removed, prior to removing the unit from the work area. If the contaminated HEPA filter is not replaced after each job, the entire ventilation unit will be securely wrapped in 6-mil fiber-tight sheeting prior to removal from the work area. Replace used filters within a containment barrier. This facility need not be at the work site.

3.9 MAINTENANCE OF THE WORK AREA

A. Install portable exhaust ventilation system equipped with HEPA filters for the work area to maintain a minimum negative pressure of 0.02 inches of water. If negative air pressure of 0.02 inches is lost, work shall be halted until negative air pressure is restored. The exhaust ventilation system shall operate on a 24-hour basis throughout the abatement process and through the clearance air monitoring. The exhaust ventilation system shall be designed in accordance with EPA recommendations included in the "Guidance for Controlling Friable Asbestos-Containing Materials in Buildings." All exhaust ventilation units will be exhausted to the outside of the building. Negative pressure will be provided inside the critical barrier from the time barrier construction has begun through the time that final clearance has been obtained.

B. Provide negative pressure recorder(s) to monitor the negative pressure differential. The permanent record will be turned over to the Asbestos Air Monitor at the beginning of each workday and will become part of the Owner's documentation records. If negative air pressure of 0.02" is lost, work shall be halted until negative air pressure is restored.

C. In a multi-room project, provide a sufficient number of portable exhaust ventilation units equipped with HEPA filters to create a flow of air from supply air openings toward the portable exhaust ventilation units to avoid any dead air pockets.

D. Make-up air entering the work area shall pass through the decontamination facility. If an auxiliary air supply system is required, it will be located where shown on the drawings or in accordance with instructions from the Engineer. The system will be filtered. The filter will be mechanically fastened. A plastic flap will be installed on the filter.

E. Acceptance of Containment Barrier Area: Once the containment barrier has been constructed, the portable exhaust ventilation units put in place, the decontamination areas prepared, and the supplies to be used have been assembled, the Asbestos Air Monitor will notify the Engineer (in the event the Engineer is not in full time attendance) that the area is ready to inspect. The Engineer and Asbestos Air Monitor may inspect the work area to ensure that barriers are properly constructed, that wall and ceiling openings are sealed, that 0.02 inches of water negative pressure has been achieved, and that all other preparations have been made to allow an efficient and safe removal operation to proceed. If all conditions are found to be acceptable, the Engineer will allow the Contractor to proceed. If conditions are not acceptable, the Contractor will correct the deficiencies.

3.10 ABATEMENT METHODS

A. Removal:

1. The asbestos will be removed in a wet state (See 40 CFR Part 61, Subpart M. See 61.147).
2. Wet all asbestos-containing building material with an amended water solution using equipment capable of providing a fine spray mist in order to reduce airborne fiber concentrations when the material is disturbed. Saturate the material to the substrate, however, do not allow excessive water to accumulate in the work area. Keep all removed material wet enough to prevent fiber release until it can be containerized for disposal. Maintain a high humidity in the work area by misting or spraying to assist in fiber settling and reduce airborne concentrations. Wetting procedures are not equally effective on all types of asbestos-containing materials but shall nonetheless be used in all cases.
3. Saturated asbestos-containing building material shall be removed in manageable sections. Removed material should be containerized before moving on to a new location for continuance of work. Surrounding areas shall be periodically sprayed and maintained in a wet condition until visible material is cleaned up.
4. Material drop shall not exceed 10 feet. For heights exceeding 10 feet, ACM must be containerized prior to lowering.
5. After completion of all stripping work, surfaces from which asbestos-containing materials have been removed shall be wet brushed and sponged or cleaned by some equivalent method to remove all visible residue.
6. During this work, the surfaces being cleaned shall be kept wet.
7. Containers (6-mil polyethylene bags or drums) shall be sealed when full. Bags shall not be overfilled. They shall be securely sealed to prevent accidental opening and leakage by tying tops of bags in an overhand knot or by taping in gooseneck fashion. Do not seal bags with wire or cord. Transport to wash room area of waste loadout.
8. Asbestos-containing waste with sharp-edged components which could tear the polyethylene bags or sheeting shall be place into burlap bags, then into poly bag and transported to wash room area of waste loadout.
9. Large components removed intact may be wrapped in one (1) layer of 6-mil polyethylene sheeting secured with tape for transport to the wash room area of the waste loadout.
10. Bags shall be washed and transferred to the bagging room for double bagging.
11. Large components shall be washed and transferred to the bagging room to be double wrapped.
12. A coating or encapsulating agent shall be applied to any porous surface that has been stripped and thoroughly cleaned of asbestos-containing materials. The encapsulating agent should also provide a surface that can accommodate subsequent coverings after the project is complete.

B. Special Circumstances:

1. In some instances, the suspended ceiling and/or the plaster ceiling must be demolished or partially demolished in order to repair plaster, encapsulate asbestos, or remove asbestos. Portions of these ceilings may be contaminated with asbestos debris. In general, in locations where asbestos removal will ultimately take place, the ceilings shall be demolished under asbestos removal conditions and the debris disposed of as asbestos debris. The Contractor should note that there could be some exceptions to this general rule as determined by the Engineer and the Asbestos Air Monitor.

2. Inspection During Removal: While performing asbestos removal work, the Contractor may be subject to periodic inspections and constant observation by the Asbestos Air Monitor and/or the Engineer who may be assisted by other safety or health personnel. If at any time the asbestos removal work is found to be in violation of this specification, the Engineer or the Asbestos Air Monitor will issue a stop work order to be in effect immediately and until the violation is resolved.
3. Standby time required to resolve the violation shall be at the Contractor's expense. Also, if the fiber count inside the containment area goes over .5 fibers/cc or the negative pressure in the containment area drops below 0.02 inches of water, the job will shut down and corrective actions taken prior to continuing. Shutdown will also occur if airborne fiber concentrations are found to be in excess of 0.01 f/cc in the clean room and any outside areas, a break occurs in the barrier, failure of workers to wear respiratory protection, or poor housekeeping inside or outside the contained area.

C. Glove Bag Removal:

1. Glove bags may be used for the removal of a short length of pipe lagging with outside diameters less than 5". Glove bags shall require the construction of a critical barrier. A portable exhaust ventilating unit will operate in the containment. Maintaining .02" of negative pressure. Asbestos from larger diameter pipes will be removed in a containment barrier as described elsewhere in this specification.
2. Personal Safety: The glove bag asbestos removal method must be done properly using all equipment and materials specified, thus there should be no fibers released into the ambient air. However, it is possible that an accident could occur (such as tearing of the bag) that would release fibers in the vicinity of the workers. Also, improper seals during preparation would result in the same condition. Therefore, the workers are required to use the following personal protective equipment:

    a. Dual Cartridge Respirator: A dual cartridge respirator shall be used and selected from among those approved by the NIOSH, Dept. of Health and Human Services, under the provisions of 30 CFR Part II (37 F.R. 6244, March 25, 1972). The filters shall be rated for asbestos-containing dusts. Any asbestos-rated powered air purifying or type "C" supplied air respirator may be used to offer an increased protection factor.
    b. Disposable Clothing: Disposable clothing, including coveralls, hoods, and booties shall be worn during the "glove bag" process from preparation of the pipe through final inspection. When the used glove bag has been placed in the 6-mil disposal bag, the disposable clothing should also be placed in the bag, sealed with tape or a tie, and stored in the sealed barrel until it can be taken to the landfill. Filters from air purifying respirators must also be disposed of as asbestos-contaminated debris.
    c. Showers: Showers are not necessarily required by workers after each "glove bag" removal. However, before each project, a portable shower shall be set up and available near the work area.
    d. Each worker may take a shower after completing an uninterrupted sequence of removal if he/she so desires, using soap and warm water whether known contamination has taken place or not. Each worker will wash face and hands after removal work and before smoke breaks, lunch, end of the workday or any other break in work. If the project requires the use of more than one glove bag, a shower must be taken.

e. Background, area and final clearance air monitoring will be required during the removal process. Glove bag removal is not to begin until approval has been obtained from the Asbestos Air Monitor. An inspection will also be conducted prior to initiating a glove bag removal to ensure that a layer of plastic has been placed under the work area and all porous wall surfaces are covered and that a portable exhaust ventilation unit equipped with HEPA filters is in operation. This inspection will also determine that the glove bag has been properly attached to the pipe and that all necessary tools are available.

3. Removal: The following steps, if done with care and attention to detail, will isolate sections of piping, valves, fittings, pipe knuckles, etc., to allow asbestos-containing insulation or lagging to be removed without allowing fibers to become airborne outside the bag. Two workmen are required for each glove bag removal.

a. Isolate the area in which removal will take place by placing barrier tape at least 6 feet external from all open entrances to affected room. Lock from external entry all but one entrance whenever possible. Determine emergency exit provisions, ideally inside panic bar fitted doors, otherwise, have key available. A wider area may be blocked off with barrier tape at the discretion of the Asbestos Air Monitor.

b. Place asbestos warning signs at all open entrances to work area conspicuously and so they can be easily read. They must conform to legal size and wording as specified in 29 CFR 1919.1001 and 1926.58.

c. Turn off or isolate HVAC system in work area from the rest of the building. Contact Engineer to inspect before proceeding with work; or in the event this is not possible, the Engineer will detail appropriate emergency provisions to turn off system.

d. Construct a critical barrier and establish negative air.

e. Put on fitted respirators and disposable coveralls, hood and booties. Ensure that disposable clothing is sealed with duct tape at wrists, ankles and neck area. This procedure is for a single glove bag. For multiple glove bag operations. full decontamination procedures are to be followed.

f. Double-check pipe, valve, etc., to ensure it is not too hot to work on. It is preferable that all services be shut down to work site for worker's safety.

g. Check HEPA vacuum to prevent circuit overload from hampering work in progress. If circuit blows, do not proceed until line with sufficient power is secured.

h. Glove Bag Use Procedure:

1) Glove bags shall be installed so that they completely cover the pipe or duct in such a manner as to be leak tight. The arms, open edges, and other openings in the glove bag shall be completely sealed with duct tape or equivalent material.

2) Asbestos-containing material shall be wet prior to removal from its substrate and maintained in a wet condition inside the glove bag.

3) Do not use glove bags directly on pipes hotter than 120 degrees F. Protective collar may be utilized with bag on pipes up to 165 degrees F.

4) Insert wetting nozzle into its porthole opening and seal with duct tape.

5) Insert HEPA vacuum nozzle in its porthole and seal with duct tape.

6) Two-Person Operation: One person inserts hands in glove bag sleeves and removes pipe insulation and the second person operates sprayer and vacuum.
7) Cut ends of pipe using bone or a flexible wire saw. Placement of end cut should be 6" in from the end of the bag.
8) If lagging has a metal jacket, this will have to be removed by cutting with tin snips first, then fold back edges so bag will not be cut. Place metal in bottom of bag.
9) Cut insulation along the tip of the pipe to the two ends. Spray insulation where cut with amended water, gently remove insulation and place in bottom of bag.
10) Wash pipe with water and rub clean.
11) Wet down the top of the bag, pipe ends, and dampen insulation at bottom of the bag.
12) Any asbestos-containing material that has been exposed as a result of the glove bag operation shall be suitably encapsulated or enclosed prior to removal of glove bag so as to prevent the emission of asbestos fibers prior to the removal of the glove bag.
13) All surfaces inside the glove bag from which asbestos has been removed and the upper portions of the glove bag itself shall be cleaned by wet wiping until no visible traces of asbestos-containing material can be seen.
14) Wash off tools and place in tool pouch.
15) Remove water wand and turn on HEPA vacuum and collapse bag. NOTE: Turn vacuum on for a second or two, otherwise motor can be damaged. Do not suck water into vacuum.
16) Twist bag just below tool pouch and seal with duct tape.
17) Place bottom of glove bag into 6-mil disposal bag (labeled).
18) Remove strap from one end of the pipe. Remove tools and place in water bucket to be washed again and wiped clean.
19) Remove all tape, unzip and fold bag carefully into disposal bag.
20) Seal any remaining open ends of insulation with high-temperature, high % resin, latex paint (paint should have about 25% solid resin).
21) Wet wipe and/or vacuum pipe and immediate area. Check for any visual contamination.
22) If no contamination has occurred and work was not done in a suspected or known contaminated space, worker may remove disposable suit and place in disposal bag.

    a) Wipe outside of respirator with wetted cloth.
    b) Remove cartridges and place cartridges in labeled disposal bag.
    c) Place respirator in a second bag and follow respirator cleaning procedures.
    d) Remove second suit.

23) If contamination has occurred and shower facilities are remote from removal area, worker will remove the outer disposable suit over the first suit and proceed to the designated emergency shower. While under the shower, disposable suit will be removed first then the respirator.
24) If a glove bag ruptures or an accident causes gross contamination of an area, maintain negative air and wait 24 hours to allow settlement of dust, then

damp-clean all surfaces again. No entry, activity or ventilation shall be permitted in the work area during settling period.

25) For multiple glove bag operations, a shower must be installed contiguous to the critical barrier.

D. Vinyl Tile and Adhesive Removal:

1. Scope of Floor Tile and Adhesive Removal:

a. Remove all floor tile and cove base in the project area.
b. Remove cove base adhesive if so directed on the drawings.
c. Remove all adhesive, etc., to the bare concrete floor.
d. Remove all small pieces of loose concrete materials.
e. The concrete floor must be cleaned to the degree that the substrate is solid, clean, and free of oil, grease, wax, latex compounds, curing compounds, dust, and surfactant used in the abatement (i.e., ASTM E 1368-90).
f. Remove adhesive under door thresholds.
g. Clean all cracks and crevices of any debris to include mastic.
h. Dissolved mastic that runs under tracks, floor treads, nosings, etc., must be cleaned to the satisfaction of the Engineer at no extra cost to the Owner. Remedial action will first be approved by the Engineer.

2. Methods of Removal may be chemical, mechanical or any combination:

a. Chemical: For chemical removal of tile, adhesive, mastic, etc., on the concrete floor, solvents must be used after normal occupied hours unless material safety data sheets name the chemical's fumes non-toxic. Follow all manufacturers' recommended procedures. All personnel must be furnished and wear appropriate protective body clothing (hand and feet), eye protection, and proper respiratory protection in accordance with NIOSH and OSHA standards to be protected from both asbestos and the chemical used. See any chemical removal limitations in Section 01014AA - Work Sequence and Special Instructions - Interior.

b. Mechanical: Mechanical removal methods of tile, adhesive, mastic, etc., from the floor, such as shot blast, sanding, and grinding will be accomplished in a wetted condition. If no wetting solution is to be incorporated, so state in the asbestos abatement plan and submit approval. The written approval will be submitted to the Engineer with the submittal package. The Contractor is responsible for power requirements of mechanical removal equipment. Lock down may be applied to the Contractor's polyed walls and ceilings; however, floors and any parts of the exposed building must be protected with poly to eliminate any possibility that lock down may get on them. Submit certification that individuals utilizing mechanical removal equipment are trained in the operation of the equipment and manufacturer's operating recommendations are followed.

3. Special Circumstances - Test Patch: The Contractor will provide a minimum of one test patch area to include the removal of an area 10' x 10' of all tiles, adhesive, mastic, etc., in front of an acetate window (additional test patch areas may be required if specified in the manufacturer's literature). The Contractor will notify the Engineer a minimum of 48 hours in advance of completion of the test patch area. The test patch area must be dry to the satisfaction of the Engineer and downtime for the drying process will be the

responsibility of the Contractor. All downtime for the inspection of the test patch area will be the responsibility of the Contractor. If the Contractor elects to change procedures after the first test patch is approved, he will then prepare another test in accordance with the above procedures.

E. ROOFING PREPARATION

1. Establish asbestos control area with rope and "keep out" signs.
2. Prepare decontamination unit.
3. Install electrical service.
4. Install water lines.
5. Sweep gravel off roofing area to be abated.
6. Prepare containment.
7. Cut roof felts and/or flashings at a point where they are non-asbestos-containing material. Cut roof in the area to be removed and patched within the containment area.
8. Establish regulated area.

F. ROOFING REMOVAL

1. Everyone inside the regulated area must have full worker protection. The area will be de-regulated at daily abatement completion, then re-regulated the following day of abatement.
2. Remove all asbestos patching, felts and flashings to include felts under gravel stop where shown on the drawings.
3. During the removal process, the asbestos-containing felts and flashings will be kept moist. Any debris will be picked up by a HEPA vacuum or other means approved by the Engineer. Discharge no visible emission during collection, packaging, transporting, or deposition. Felts are to be removed down to the insulation or to non-asbestos-containing material.
4. Cut felts and flashing in manageable pieces. Cutting method to be approved by the Engineer. Collect felts, etc., and place in burlap bags which will be inside double 6-mil poly bags. Collect other asbestos waste, scrap, debris, and asbestos-contaminated clothing and seal in double 6-mil impermeable poly bags. Affix a caution label to each bag and dispose of in accordance with these specifications.
5. Any mastic residue in a non-friable condition on metal, masonry, etc., that cannot be removed without damage to the substrate may remain.
6. All roofing abatement equipment to be cleaned, secured, and inspected by an Independent Asbestos Inspector before the abatement crew leaves the project, and or before the roof is covered with the new roof system.

G. Encapsulation will be used where indicated in the specifications.

1. All work will be performed utilizing work practices heretofore prescribed.
2. All work will be performed
utilizing proper personal protective equipment as heretofore prescribed for worker protection.

a. Sprayed-on Asbestos: Repair damaged and missing areas of existing sprayed-on asbestos to obtain a suitable base for sealing and to restore continuity of existing materials. Use the specified asbestos-free replacement material. Prepare surfaces

and apply replacement material in accordance with manufacturer's recommendation.

b. Thermal Pipe Insulation: Remove loose or hanging asbestos material. Pack in labeled sealable plastic bags of 6-mil minimum thick, and place in labeled containers for transport.

3. Apply coatings identified according to the manufacturer's recommendations.
4. For thermal pipe insulation, apply re-wettable cloth and white mastic where specified.
5. HEPA vacuum and wet wipe up any residue.

H. Asbestos Enclosure:

1. Enclosing asbestos-containing material behind a rigid fiber-tight barrier without disturbing asbestos or causing a fiber release episode will be accomplished in the following manner:

   a. The workplace enclosure requirements stated in the Department of Environmental Protection Rules and Regulations shall apply when enclosing asbestos-containing material behind a rigid fiber-tight barrier.
   b. All areas of asbestos-containing materials shall be sprayed with water if those areas may be disturbed during the installation of hangers, brackets or other portions of the fiber-tight barrier.
   c. All loose and hanging asbestos-containing material shall be removed as follows:
   d. All asbestos-containing material shall be adequately wetted using a water solution or equivalent wetting agent throughout the removal process until disposal.
   e. If structural components are to be removed, they shall be wrapped and removed intact or in large sections whenever possible and carefully lowered to the floor. Structural components shall be thoroughly wetted prior to wrapping in fiber-tight sheeting for disposal. Water shall be visible or evident inside the wrapping.
   f. Asbestos-containing material shall not be dropped or thrown to the floor level. Asbestos-containing material may be carefully lowered to a raised scaffolding or containerized at elevated levels for transport and disposal.
   g. A coating or encapsulating agent shall be applied to any porous surface that has been stripped of asbestos-containing materials to securely seal any residual fibers that may be present. The encapsulating agent should be chosen so as not to damage or weaken the substrate on which it is to be applied and should adequately adhere to the substrate. The encapsulating agent should also provide a surface that can accommodate subsequent coverings after the project is complete.

2. Non-asbestos-containing substitutes shall be used to patch thermal insulation and fireproofing materials when required and where appropriate.
3. Enclosures for asbestos-containing materials shall be specifically designated by signs, labels, color coding, or some mechanism to warn individuals who may be required to disturb or enter the enclosure.
4. Clean up shall be in accordance with the following section on "Final Clean Up and Inspection Procedure."

I. Specific Requirements - Encapsulation - Glove Bag: Prior to removal of the glove bag, a spray-type encapsulant will be used to seal the friable ends. Application to be in strict accordance with the manufacturer's recommendations.

3.11 FINAL CLEANUP AND INSPECTION PROCEDURE

A. After the removal, encapsulation, and/or enclosure of asbestos has been completed and before removal of barriers, piping and all other surfaces within the work area shall be thoroughly wet cleaned and/or vacuumed. Waste containers (except those containers necessary for waste from final cleanup) shall be packed, cleaned, and removed from the work area prior to final cleanup and monitoring.

B. The specific instructions for cleaning and clearance will be found in Section 01014AA - Work Sequence and Special Instructions – Interior, and or Section 01015AA - Work Sequence and Special Instructions – Roofs, The work area must be clean and in accordance with ASTM E 1368-90.

C. Clearance air monitoring will be conducted in accordance with the protocol established in Division 1 - General Requirements, Section 01410AA - Testing Laboratory Services - Asbestos.

D. Responsibility for Damages: Any damage to the finishes, floor, walls, or any other items or fixtures that has been the result of actions by the Contractor's personnel shall be repaired to their original condition without any additional cost to the Owner.

3.12 REINSTALLATION OF EQUIPMENT

A. When cleanup is complete, relocate objects moved to temporary locations in the course of the work to their proper positions.

3.13 DISPOSAL

A. Collect asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing which may produce airborne concentrations of asbestos fibers thoroughly wetted and seal in double 6-mil impermeable poly bags. Affix a caution label to each bag. For temporary storage, store sealed impermeable bags in asbestos waste drums or skips. An area for interim storage of asbestos waste-containing drums or skips will be assigned by the Engineer. The asbestos-containing building material may be placed in a locked truck and kept on location until the truck is fully loaded. When the asbestos-containing building material is ready to be hauled to the landfill, arrangements will be made for an escort if one is required. The asbestos-containing building material will be moved to the landfill in full loads during the daytime.

B. Procedure for hauling and disposal shall comply with 40 CFR 61 (Subpart B), state, regional, and local standards. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or state-approved sanitary landfill. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Uncontaminated drums may be recycled. Workers unloading the sealed drums shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site.

C. Receipts will be furnished to driver and be completed in full at the landfill showing date, time received, vehicle license number, signature of landfill receiver and cubic volume of material. Receipts to be forwarded to Engineer as required in Section 01300AA - Submittals - Asbestos.

D. The Asbestos Foreman will visually inspect the interior of the truck body for cleanliness before loading begins. If the truck body has any visible residue of asbestos, the body is to be thoroughly cleaned before using.

END OF SECTION 13280

SECTION 15050 - BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The work of this section consists of furnishing all labor, equipment and materials, and performing all operations necessary to complete work in accordance with these specifications.

B. Work includes, but is not limited to:

1. Modifications and extensions to roof drain piping.
2. Removal and reinstallation of mechanical equipment to include rooftop fans, gravity ventilators, etc., as necessary for structural upgrades and roof replacement as herein specified. Extend ductwork, piping, controls, etc., as required for reconnection to relocated equipment.
3. Temporary support and final permanent support of existing piping systems, ductwork systems, air handling units, and miscellaneous HVAC equipment is necessary for structural upgrades and roof replacement as herein specified.
4. Testing, adjusting, balancing, and temperature control recommissioning of renovated systems, to the extent necessitated.
5. Insulation of existing piping systems.
6. Specific HVAC and Plumbing work shall include but not be limited to the following (see also drawing MH-100 for key noted items):
    a. HVAC equipment and ductwork removal and reinstallation.
    b. Piping for relocated roof drains.
    c. Provide and install new insulation on all existing steam, condensate, domestic hot and cold water, and new/existing rain leader piping.

1.2 GENERAL CONDITIONS

A. Related Sections Include the Following: Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 specification sections, apply to this section.

B. Guarantee: All work executed under this section shall be guaranteed for one (1) year as stated in the General Conditions.

C. Permits and Laws:

1. Obtain and pay for all required permits, inspections, licenses, etc.
2. Execute all work to conform to the requirements of all local, State and Federal laws, regulations, etc., applicable to the work.

D. Drawings:

1. The drawings do not show every pipe, fitting, or HVAC equipment, but it shall be a requirement to furnish, without additional expense, all material and labor necessary to complete the system in accordance with the best practice of the trade.
2. Site Visit: The Contractor estimating and submitting a bid for the work covered by this section of the specification shall visit the site, and view conditions as they exist prior to submission of a bid. The submission of a bid shall be taken as evidence that the bidder has examined the existing conditions and has satisfied himself as to the various requirements, obstacles and advantages of performing the work. No subsequent allowances will be made in this respect due to failure of the Contractor to meet the full requirements of this specifications.
3. Protection of Equipment and Materials: Responsibility for care and protection of all materials and mechanical work rests with the Contractor at all times until the entire project has been completed, tested, and the project is accepted. Damaged equipment shall be placed in first class operating condition or be returned to the source of supply for repair or replacement to the satisfaction of the Engineer.

4. Foundations:
    a. Ceiling Mounting: Where ceiling mounting is indicated or specified, use suspended platform or strap hangers, bracket or shelf, whichever is most suitable for equipment and its location. Construction of structural steel members, steel plates, rods, as required, brace and fasten to building structure or to inserts as approved.
    b. Structural steel required to support equipment shall be furnished.

5. Applicable Publications:

    a. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

        1) American Society for Testing and Materials (ASTM):
            C 449-77 Specifications for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement
            C 585-76 Inner and Outer Diameters of Rigid Thermal Insulation for Nominal sizes of Pipe and Tubing (NPS System)
            781-68 Puncture and stiffness of Paperboard, Corrugated and Solid Fiberboard, Test
            E 84-79B Surface Burning Characteristics of Building Materials Test
            E 119-78 Fire Tests of Building Construction and Materials
            E 136-73 Noncombustibility of Elementary Materials, Test

        2) National Fire Protection Association (NFPA):
            NFPA 255 Surface Burning Characteristics of Building Materials - 1976
            NFPA 90A Air Conditioning and Ventilation Systems - 1976

        3) Underwriters Laboratories, Inc. (UL):
            UL 723 Tests for Surface Burning Characteristics of Building Materials

6. Shop Drawings: The Contractor shall, after the award of Contract, and before installation, submit for approval shop drawings of equipment and material to be furnished under this Contract. After shop drawings have been given final approval, the Engineer shall retain three (3) copies of shop drawings. The following items of equipment shall be submitted for approval:

   a. Piping Accessories (hangers, etc.)
   b. Insulation
   c. Other equipment as the Engineer may require.

7. Substitutions:

   a. The bid shall be based on the materials or products as specified. Whenever in the specifications a particular article is specified by proprietary name, names, or "approved equal", the bidder shall base his bid on one of the above.
   b. See section 01005, 1.08F.
   c. Any materials or products not herein specified, but worthy of consideration shall be so noted in a separate letter attached to his Proposal Form, stating supplier, manufacturer or name and the amount to be added to or deducted from base bid and his reasons for the suggested substitution. He shall also assume the costs necessary for revision in other trades due to this substitution.

8. Painting:

   a. Painting by Section 09900.

PART 2 - PRODUCTS

2.1 MATERIALS

A. 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 otherwise specified.

2.2 PIPE INSULATION

A. General Requirements:

1. Required burning characteristics for insulating materials - (including Covering):

   a. Flame Spread Rating: Not over 25.
   b. Smoke Developed: Not more than 50.
   c. Test Methods: ASTM E84, UL 723, or NFPA 255.
   d. Underwriters Laboratories, Inc., label or listing, or satisfactory certified test report from an approved testing laboratory will be required to show that surface burning characteristics for materials to be used do not exceed specified ratings.
      Materials excepted from specified ratings:

1) Factory premolded one-piece PVC fittings and valve covers.
2) Weatherproof coating

2. Every package or standard container of insulation or accessories delivered at the job site for the use must have a manufacturer's stamp or label giving the name of the manufacturer and description of the material.
3. Scope:

a. Insulate all horizontal and vertical rain leaders in renovated areas including roof drain sump.
b. Insulate all existing steam and condensate piping in renovated areas.
c. Insulate all existing domestic cold and hot water piping.

B. Fiberglass Insulation for Pipe:

1. Glass fiber insulation shall have a minimum density 6 pcf, k = 0.24, for use at temperatures of 0 degrees F to 450 degrees F.
2. Pipe covering, standard thicknesses per ASTM C585 modified by industry standard, in nominal thickness as tabulated below for piping.

PIPE INSULATION TABLE

Pipe	Rain	Domestic			
Size	Water	Hot	Cold	Steam Supply	Condensate Return
1" and less	---	1"	1"	1"	1"
1 ¼ "to 2"	---	1"	1"	1 ½	1"
2 ½" to 4	1/2"	1 ½"	1"	2"	2"
5" and more	1/2 "	---	---	2"	---

3. Materials shall be as manufactured by Owens-Corning, Certain Teed, Johns-Manville or approved equal.

C. Insulation Facings and Jackets:

1. Puncture Resistance: 50 units (ASTM D-781).
2. Noncombustible Vapor Barrier Jacket: All pipe insulation jackets, unless approved otherwise, facings and jackets shall be white all service type (ASJ) Suitable for painting without sizing. Fire and smoke treatment of jackets and facings shall be permanent. The use of water soluble treatments is not acceptable. Pipe insulation jackets shall have a 1-1/2" minimum lap at longitudinal joints and not less than 3" butt strips at end joints. Facing on board, blanket and block insulation shall have 2" laps or 3" minimum butt strips. Butt strip material shall be the same as the jacket or facing. Laps and butt strips may be self-sealing type with factory applied pressure sensitive adhesive.
3. PVC Fitting Cover: Prefabricated of one piece PVC insulated fitting cover equal to "Zeston" or equal will be acceptable. Provide color match, vapor barrier, pressure sensitive tape, etc.

D. Insulation Accessory Materials:

1. Insulation Inserts at Supports on Outside of Insulation:

a. Provide for all Piping: Install with metal insulation shields furnished with pipe supports. Minimum insert length: 10" for up to 3" pipe: 12" for 3" to 6" pipe: and 16" for 8" to 10" pipe.

2. Mechanical Fasteners:

a. Staples: Outward clinching monel or stainless steel.
b. Wire: 18 gauge soft annealed galvanized, or 14 gauge copper clad steel or nickel copper alloy.
c. Bands: 3/4" nominal width, brass, galvanized steel, aluminum or stainless steel.

2.3 PIPING, FITTINGS AND MISCELLANEOUS MATERIALS: Match existing systems except as follows.

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Pipe Hangers and Supports:

a. B-Line Systems, Inc. (Basis of Design)
b. Carpenter & Patterson, Inc.
c. Grinnell Corp.
d. National Pipe Hanger Corp.
e. Piping Technology & Products, Inc.
f. Unistrut

B. Hangers:

1. Hanger "Types" listed below are from Table 1 of MSS SP-69.
2. Uninsulated pipes 2 inch and smaller:

a. Type 10: Adjustable steel swivel ring (band type) hanger, B-Line B3170.
b. Type 5: Adjustable steel swivel J-hanger, B-Line B3690.
c. Type 12: Malleable iron ring hanger, B-Line B3198R or hinged ring hanger, B3198H.
d. Type 1: Adjustable steel clevis hanger, B-Line B3100.

3. Uninsulated pipes 2-1/2 inch and larger:

a. Type 1: Adjustable steel clevis hanger, B-Line B3100.
b. Type 41: Pipe roll with sockets, B-Line B3114.
c. Type 43: Adjustable steel yoke pipe roll, B-Line B3110.

4. Insulated pipe- Hot or steam piping:

a. 2 inch and smaller pipes: use adjustable steel clevis with galvanized sheet metal shield. Type 1 with Type 40 (B-Line B3151) series insulation protection shield.
b. 2-1/2 inch and larger pipes:

1) Adjustable steel yoke pipe roll with pipe covering protection saddle. Type 43 with Type 39 (B-Line B3160-B3165 series) pipe covering protection saddles.
2) Pipe roll with sockets with pipe covering protection saddle, Type 41 with Type 39 (B-Line B3160-B3165 series) pipe covering protection saddles.

5. Pipe Clamps

a. Type 4: When flexibility in the hanger assembly is required due to horizontal movement, use pipe clamps with weldless eye nuts, B-Line B3140.
b. Type 3: For insulated lines use double bolted pipe clamps, B-Line B3144.

6. Wall Supports

a. Pipes 4 inch and smaller: Type 5 J Hanger. B-Line B3690.
b. Pipes larger than 4 inch: Type 32.

7. Vertical Supports

a. Type 8: Steel riser clamp sized to fit outside diameter of pipe, B-Line B3373.

8. Supplementary Structural Supports

a. Design and fabricate supports using structural quality steel bolted framing materials as manufactured by Cooper B-Line. Channels shall be roll formed, 12 gauge ASTM A1011 SS Grade 33 steel, 1-5/8 inch by 1-5/8inch or greater as required by loading conditions.

C. Upper Attachments

1. Beam Clamps

a. Beam clamps shall be used where piping is to be suspended from building steel. Clamp type shall be selected on the basis of load to be supported, and load configuration.
b. Type 23 C-Clamps shall have locknuts and cup point set screws, B-Line B351L, or B3036L.
c. Type 19 Top flange c-clamps shall be used when attaching a hanger rod to the top flange of structural shapes, B-Line B3034 or B3033.
d. Refer to manufacturers recommendation for setscrew torque.
e. Retaining straps shall be used to maintain the clamps position on the beam where required.

2. Concrete Inserts

a. Type 18: Cast in place spot concrete inserts shall be used where applicable; either steel or malleable iron body, B-Line B2500 or B3014. Spot inserts shall allow for lateral adjustment and have means for attachment to forms. Select inserts to suit threaded hanger rod sizes, B-Line N2500 or B3014N series.
b. Continuous concrete inserts shall be used where applicable. Channels shall be 12 gauge, ASTM A1011 SS Grade 33 structural quality carbon steel, complete with

Styrofoam inserts and end caps with nail holes for attachment to forms. The continuous concrete insert shall have a load rating of 2,000 lbs/ft. in concrete, B-Line B22I, 32I, or 52I. Select channel nuts suitable for strut and rod sizes.

D. Accessories

1. Hanger Rods shall be threaded both ends, or continuous threaded rods of circular cross section. Use adjusting locknuts at upper attachments and hangers. No wire, chain, or perforated straps are allowed.
2. Shields shall be 180 degree galvanized sheet metal, 12inch minimum length, 18 gauge minimum thickness, designed to match outside diameter of the insulated pipe, B-Line B3151.
3. Pipe protection saddles shall be formed from carbon steel, 1/8 inch minimum thickness, sized for insulation thickness. Saddles for pipe sizes greater than 12 inch shall have a center support rib.
4. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars, black and galvanized.

E. Pipe and Fittings:

1. PVC Pipe: ASTM D 2665, solid wall drain, waste, and vent.
2. PVC Fittings: ASTM D 2665, sockettype, made to ASTM D 311, drain, waste, and vent patterns.
3. Cast Iron Pipe: Hub-Spigot Pipe, ADTM A 74 Service Extra-Heavy class.
4. Hubless Cast Iron Pipe and Fittings: ASTM A 888 or CISPI 301. Couplings: ASTM C 1277 assembly of metal housing, corrosion-resistant fasteners, and ASTM C 564 rubber sleeve with integral, center pipe stop.
5. Steel Pipe, NPS 2 and Smaller: ASTM A 53, Type S (seamless) or Type F (furnace-butt welded), Grade B, Schedule 40 and 80, black steel, plain ends.
6. Steel Pipe, NPS 2-1/2 through NPS 12: ASTM A 53, Type E (electric-resistance welded), Grade B, Schedule 40 and 80, black steel, plain ends.
7. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300.
8. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300.
9. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.
10. Gasket Material: Thickness, material, and type suitable for fluid to be handled; and design temperatures and pressures.

PART 3 - EXECUTION

3.1 INSPECTION

A. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify that work may proceed in strict accordance with all pertinent codes and regulations and the approved shop drawings.

C. In the event of discrepancy, immediately notify the Owner.

D. Do not proceed with installation in areas of discrepancy until such discrepancies have been fully resolved.

3.2 MECHANICAL DEMOLITION

A. Refer to Division 1 for cutting and patching and general demolition requirements and procedures.

B. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.

1. Pipes to be removed: Remove portion of piping indicated to be removed and connect the new piping to existing piping as indicated.

C. If insulation, or ductwork to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.3 INSTALLATION OF PIPING AND EQUIPMENT

A. General:

1. New rain leader piping shall be Schedule 40 PVC or Cast iron (Contractor's choice).
2. 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.
3. Inspect each piece of pipe, tubing, fittings, and equipment for defects and obstructions. Promptly remove all defective material from the job site.
4. 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/Engineer.
5. All risers and off-sets shall be substantially supported.
6. Arrange all piping to maintain required grade and pitch to lines to prevent vibration.

B. Joints and Connections:

1. Pack all joints in cast iron soil and waste pipe and fittings, using oakum and securing with one inch deep lead caulking, fully and properly caulked and smoothly finished.
2. Provide the recommended torque on all clamps for "no hub" pipes.
3. Install PVC drain piping in accordance to ASTM D 2665.

3.4 INSULATION INSTALLATION

A. Molded Fiberglass Pipe Covering:

1. Fit insulation to pipe aligning longitudinal joints. Seal longitudinal joint laps and circumferential butt strips by rubbing hard with a nylon sealing tool to assure a positive seal. Staples may be used to assist in securing insulation. Staples shall not penetrate more than one half the insulation thickness. Seal all vapor barrier penetrations with vapor barrier mastic. Provide inserts and install with metal insulation shields at outside pipe supports.

2. Contractor's Options for Fitting Insulation:

a. Factory premolded, one piece PVC covers with mineral fiber inserts. Provide two insert layers for pipe temperature below 40 degrees F or above 250 degrees F. Secure first layer of insulation with twine. Seal seam edges with vapor barrier mastic and secure with fitting tape.

b. Factory molded or field mitered sections, joined with adhesive or wired in place. For cold fittings, 60 degrees F or less, vapor seal with a layer of glass fitting tape imbedded between two 1/16" coats of vapor barrier mastic.

c. Fitting tape shall extend over the adjacent pipe insulation and overlap on itself at least two inches.

3.5 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 of the work be covered up or enclosed prior to all required inspections and approvals, uncover the work as required and, after it has been completed inspected and approved, make all repairs and replacements with such materials as are necessary to the approval of the Owner's Representative and at no additional cost to the Owner.

C. Hangers and Supports:

1. All hangers shall be supported by structural members. No attachments shall be made to the roof deck.

3.6 SHEET METAL WORK AND MATERIALS

A. General: Furnish and install all required sheet metal work for the complete temporary support, permanent resupport extensions, etc., for ductwork labor and materials in accordance with the intent of the drawings and specifications. Ductwork shall be fabricated in accordance with SMACNA, HVAC Duck Construction Standards, metal and flexible.

3.7 CONTROLS

A. The contractor shall reinstall control wiring, devices, relays, transformers, etc. for complete system of electronic control as follows:

1. Reinstalled Equipment: Reconnect all control wiring, devices, relays, transformers, etc. to the existing control system as required to restore operation of existing fans, dampers, activators, etc. to the condition currently in place. The contractor shall field verify and document existing condition and operation.

3.8 JOB CLOSING

A. Testing and Adjusting for all existing air handling equipment:

1. All controls should be checked out and be operating correctly prior to start-up of the system. Final set points and adjustments may be made during or after the balancing.

B. Cleaning:

1. The entire system installations including apparatus, motors, etc., shall be left in first-class condition including cleaning, oiling and packing.

END OF SECTION 15050

SECTION 16000 - BASIC ELECTRICAL REQUIREMENTS

PART 1: GENERAL

1.1 WORK INCLUDED

A. Furnish all equipment, materials, labor, and supplies and perform all operations necessary to provide a complete and operable electrical system as indicated or implied on the drawings and as specified herein.

B. Remove, relocate, and reinstall any existing electrical equipment, conduit, wiring, fixtures, etc. as required to facilitate the work this project.

C. Temporary Power and Lighting:

1. Power Distribution: Provide weatherproof, grounded circuits with ground-fault interruption features, with proper power characteristics and either permanently wired or plug-in connections as appropriate for intended use. Provide overload-protected disconnect switch for each circuit at distribution panel. Space 4-gang convenience outlets (20 amp circuit) so that every portion of work can be reached with 100' extension cord.

2. Temporary Lighting: Provide lighting of intensity and quality sufficient for proper and safe performance of the work and for access thereto and security thereof. (Consult OSHA requirements.)

D. Provide unit prices on a per fixture basis for replacement of any fixtures. Provide list of any fixtures not working prior to starting the work.

1.2 QUALITY ASSURANCE

A. All wiring shall be in accordance with the latest issue of the National Electrical Code.

B. All electrical equipment shall be approved by Underwriters Laboratories, Inc. Each system shall be products of a single manufacturer of established reputation and experience. The Contractor shall have supplied similar apparatus to comparable installations rendering satisfactory service for at least three years.

C. The Contractor shall guarantee all equipment and wiring free from inherent mechanical or electrical defects for one year from date of acceptance.

D. Protection of Equipment and Materials: Responsibility for care and protection of all materials and work rests with the Contractor at all times until the entire project has been completed, tested and the project is accepted.

1. Damaged equipment shall be placed in first class operating condition or be returned to the source of supply for repair or replacement to the satisfaction of the Owner's Representative.

2. Painted surfaces shall be protected with removable heavy kraft paper, sheet vinyl or equal.

1.3 SYSTEM DESCRIPTION:

A. The intent of the drawing and this specification is to maintain, as closely as possible and as permitted by code, the system as it currently exists, except as otherwise indicated. Provision of all electrical work necessary to comply with this intent is hereby made part of the work of this division.

1.4 SUBMITTALS

A. In accordance with Section 01005, furnish the following:

1. Manufacturer's descriptive literature: for each type of product indicated.

2. Submit shop drawings that include engineering drawings of the system with specification sheets covering all component parts of the system and interconnection diagrams.

3. Certification:

a. Prior to final inspection, deliver to the Owner's Representative four (4) copies of certification that the material is in accordance with the drawings and specifications and has been properly installed.

b. Submit certification of system operating test.

1.5 PROJECT CONDITIONS

A. Regulatory Requirements:

1. Conform to the requirements of all laws and regulations applicable to the work.

2. Cooperate with all authorities having jurisdiction.

3. Compliance with laws and regulations governing the work on this project does not relieve the Contractor from compliance with more restrictive requirements contained in these specifications.

4. If the Contract Documents are found to be at variance with any law or regulation, the Contractor shall notify the Architect/Engineer promptly in writing. The Contractor shall assume full responsibility for any work contrary to law or regulation, and shall bear all costs for the corrections thereof.

5. Minimum Requirements: The National Electrical Code (NEC), Underwriters Laboratories, Inc. (UL), the National Fire Codes, and National Fire Protection Association (NFPA) are a minimum requirement for work under this section. Design drawings and other specification sections shall govern in those instances where requirements are greater than those specified in the NEC.

B. Permits, Fees, and Inspections:

1. Secure and pay for all permits, fees, licenses, inspections, etc., required for the electrical work.

2. Schedule and pay for all legally required inspections and cooperate with inspecting officers.

3. Provide Certificates of Inspection and Approval from all regulatory authorities having jurisdiction over the electrical work.

C. Drawings:

1. Do not scale the drawings. The general location of the apparatus and the details of the work are shown on the drawings, which form a part of this specification. Exact locations are to be determined at the building as the work progresses, and shall be subject to the Architect/Engineer's approval. Actual field conditions shall govern all dimensions.

2. Anything shown on the drawings and not mentioned in the specifications or vice versa shall be furnished as if it were both shown and specified.

3. It is not intended that the drawings shall show every wire, device, fitting, conduit or appliance, but it shall be a requirement to furnish without additional expense, all material and labor necessary to complete the systems in accordance with the NEC and the best practice of the trade.

1.6 WARRANTY

A. The Contractor shall guarantee all equipment and wiring free from inherent mechanical or electrical defects for one year from date of acceptance.

1.7 RELATED WORK

A. Division 5 – Metals

B. Division 7 – Thermal and Moisture Protection

PART 2: PRODUCTS

2.1 MATERIALS

A. Boxes shall be steel minimum 1-1/2" deep.

B. Wiring Materials:

1. Wiring shall be enclosed in electrical rigid galvanized steel, intermediate metal conduit, or electrical metallic tubing sized in accordance with code requirements for the conductors. Type MC cable may be used where concealed in walls or ceilings where permitted by code.

a. Terminations for all conduit shall have insulated bushings or insulated throat connectors in accordance with code requirements.

b. All conduits shall be substantially supported with approved clips or hangers spaced not to exceed ten feet on center. Minimum conduit size shall be 1/2".

2. Flexible Metal Conduit shall be used for all connections to motors and vibrating equipment and shall comply with Fed. Spec. WW-C-566.

3. Liquid-Tight Flexible Metal Conduit shall consist of flexible steel conduit with a liquid-tight PVC jacket over the conduit.

a. Fittings shall incorporate a threaded grounding cone, a steel or plastic compression ring, and a gland for tightening.

b. Liquid-tight flexible metal conduit shall be used in damp or wet locations when flexible metal conduit would otherwise be used.

4. All Wiring shall be type THW, XHHW, or THWN, UL labeled, copper conductors with 600-volt insulation, except as otherwise noted. Minimum size wire shall be No. 12 AWG.

5. Type MC Cable shall have minimum No. 12 AWG type THWN or XHHW insulated copper conductors with an internal bare or insulated copper ground wire. MC cable may be used only where concealed.

6. Fire Alarm Wiring:

a. Wiring shall be in accordance with NEC Article 760 and as recommended by the manufacturer of the fire alarm system. All wires shall be color-coded and installed in metal conduit where exposed. Conduit fill shall not exceed 40 percent of interior cross sectional area. Number and size of conductors shall be as recommended by the fire alarm system manufacturer. Conduit shall be 1/2" minimum.

b. Wires in junction boxes and cabinets shall be permanently tagged and identified with metal tags.

7. Fire Alarm Terminal Boxes, Junction Boxes and Cabinets:

a. Shall be galvanized steel in accordance with UL.

b. Paint red and identify with white markings as "Fire".

c. Junction boxes shall have a volume 40 percent greater than required by the NEC. Minimum sized wire shall be considered as 14 AWG for calculation purposes.

C. Circuit Breakers: Circuit breakers to be added to existing panelboards shall match existing circuit breakers.

D. Grounding Conductors:

1. Grounding Conductors shall be soft-drawn bare copper.

2. Insulated Grounding Wires shall be UL and NEC approved types, copper, with THWN or XHHW insulation, color identified green, except where otherwise shown on the drawings or specified.

3. Wire shall not be less than shown on the drawings and not less than required by the NEC.

E. Grounding Connections: Connections shall be of the compression type solderless connectors.

PART 3: EXECUTION

3.1 INSTALLATION

A. General:

1. All work shall be in accordance with the National Electrical Code's requirements as amended to date, with the local electric utility company's rules, the Fire Underwriter's requirements, and all local, state and federal laws and regulations.

2. In general, all wiring in finished areas shall be concealed in walls or above ceilings. Exposed wiring shall not be installed in finished areas without prior written authorization from the Engineer.

3. Conduits shall be of sizes required by the National Electrical Code. Exposed conduits shall be installed with runs parallel or perpendicular to walls and ceiling, with right-angle turns consisting of bends, fittings, or outlet boxes. No wire shall be installed until work that might cause damage to wires or conduits has been completed. Conduits shall be thoroughly cleaned of water or other foreign matter before wire is installed.

4. All splices shall be mechanically and electrically perfect, using crimp type wire connectors.

5. A typewritten schedule of circuits, approved by the Owner's Representative shall be on the panel directory cards. Type the room numbers and items served on the cards. Three- complete separate copies of all directories, neatly bound, shall be delivered to the Owner's Representative.

6. Revise existing panelboard directories. Furnish new cards as needed.

7. Feeder circuit wiring shall be in conduit or EMT.

8. In general, conductors shall be the same size from the last protective device to the load and shall have an ampacity the same as or greater than the ampacity of the protective device where the wire size is not shown on the drawings. Use the 60°C ampacity rating for wire sizes No. 14 through No. 1. For 120V circuits, home runs longer than 50 feet shall be

minimum No. 10 AWG, longer than 100 feet shall be minimum No. 8 AWG, and longer than 180 feet shall be minimum No. 6 AWG.

B. Grounding:

1. The entire electrical system shall be permanently and effectively grounded in accordance with Code requirements.

2. Connections to junction boxes, equipment frames, etc., shall be bolted.

3. Conduit Systems:

a. Ground all metallic conduit systems.

b. Conduit systems shall contain a grounding conductor sized per NEC Table 250-122 or as shown on the drawings. Increase conduit size where necessary to accommodate the grounding conductor.

4. Branch Circuits: Install green grounding conductors with all branch circuits.

5. Lighting Fixtures: Conduits shall not be used for grounding fixtures. Green equipment grounding conductor must be bonded to all fixtures.

C. Alterations:

1. The Contractor shall study all drawings and specifications and visit the site to acquaint himself with the existing conditions and the requirements of the plans and specifications. No claim will be recognized for extra compensation due to the failure of the Contractor to familiarize himself with the conditions and extent of the proposed work.

2. Execute all alterations, additions, removals, relocations or new work, etc. as indicated or required to provide a complete installation in accordance with the intent of the drawing and specifications.

3. Reconnect existing circuits to remain. Remove existing equipment and wiring to be discontinued.

4. Any existing work disturbed or damaged by the alterations or new work shall be repaired or replaced to the Engineer's satisfaction.

5. Equipment relocated or removed and reinstalled shall be cleaned and repaired to a first-class condition before reinstallation.

D. Fire Alarm System Installation:

1. Installation shall be in accordance with the NEC Article 760.

2. All wiring shall be one wire per terminal to insure supervision. Crimp-on connectors shall not be used.

3. All wiring shall be color-coded and tagged and shall be checked for continuity, short circuiting, and resistance to ground.

4. Tests:

   a. Provide the service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system. Make all adjustments and tests in the presence of the Owner's Representative.

   b. When the systems have been completed and prior to the final inspection, furnish testing equipment and perform the following tests in the presence of the Owner's Representative.

      1) Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

      2) Test the insulation on all installed cable and wiring by standard methods as recommended by the equipment manufacturer.

      3) Open fire alarm detector circuits to see if trouble signal actuates.

      4) Check installation, supervision, operation and sensitivity of smoke detectors as recommended by the manufacturer to ascertain that they will avoid false alarm signals and will function as specified.

      5) Perform any other tests recommended by the equipment manufacturer.

6. Final Inspection: At the final inspection a factory-trained representative of the manufacturer of the existing equipment shall demonstrate that the systems function properly in every respect. The demonstration shall be made in the presence of the Engineer.

E. Identification: Provide tags on each end of all pulled wires giving location of other end. Provide phenolic nameplates for all panelboards, motor starters, and disconnect switches (except switches located at motors).

F. Record Drawings: The Contractor shall keep on the job a set of prints showing any changes to the installation. These shall be given to the Engineer at the completion of the work.

G. Testing and Adjusting:

1. The entire installation shall be free from short-circuits and improper grounds. Tests shall be made in the presence of the Engineer or his representatives.

2. Each individual lighting circuit shall be tested at the panel; and in testing for insulation resistance to ground, the lighting equipment shall be connected for proper operation. In no case shall the insulation resistance be less than that required by the National Electrical Code. Failures shall be corrected in a manner satisfactory to the Engineer.

3. Each system shall be completely tested and shall be adjusted for proper operation as required by the Engineer.

END OF SECTION 16000

allied *engineering, inc.*

Structural Mechanical Electrical Technology

LETTER OF TRANSMITTAL

To: **Michael J. Nugent**
City of Portland

Address: City Hall Room 315
389 Congress Street
Portland, ME 04101

Date: **4/29/2003**

Sent Via: ☐ Courier ☐ FedEx ☐ Picked Up ☐ UPS ☐ Mail

☐ Fax: # _____

Hard copy to follow? ☐ Yes ☐ No

AEI Project #: **02-017**

Project Name: STEVENS AVENUE ARMORY

☐ SHOPS ☐ PLANS /SPECS ☐ PRINTS ☐ QUALS PKG ☐ REPORT ☒ OTHER(see below)

☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

M:\FORMS - NEW\AEI-XMTL.doc

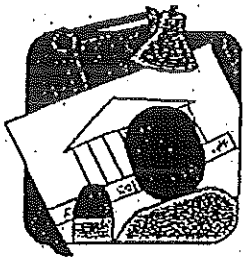
COPIES	AEI SUBMTL #	DESCRIPTION
1		Building Code Certificate

COPY: (1) File
(1) Norm Smith

SIGNED: William P. Faucher, P.E.

One Westbrook Commom, Westbrook, ME 04092
207-854-8126 Voice 207-854-0603 Fax

Web: www.allied-eng.com
E-Mail: info@allied-eng.com



CITY OF PORTLAND MAINE

389 Congress St., Rm 315
Portland, ME 04101
Tel. – 207-874-8704
Fax – 207-874-8716

TO: Inspector of Buildings City of Portland, Maine
Planning & Urban Development
Division of Housing & Community Services

FROM DESIGNER: allied engineering, inc.

One Westbrook Common, Westbrook, ME 04092

DATE: April 29, 2003

Job Name: Stevens Avenue Armory - Reroof/Structure Upgrade

Address of Construction: Stevens Avenue, Portland, Maine

THE BOCA NATIONAL BUILDING CODE/1999 FourteenthEDITION

Construction project was designed according to the building code criteria listed below:

Building Code and Year: BOCA 1999/14th Ed. & Local Amendments Use Group Classification(s): A-Z

Type of Construction: 3B Bldg. Height: 25-30 Ft. Bldg. Sq. Footage: 14,700 Drill Hall onl

Seismic Zone: 2 Group Class: Seismic Hazard Exposure Group III

Roof Snow Load Per Sq. Ft.: Adjusted P_f=42.0 psf Dead Load Per Sq. Ft.: 10psf

Basic Wind Speed (mph): 85 mph Effective Velocity Pressure Per Sq. Ft.: 18.5 psf

Floor Live Load Per Sq. Ft.: N/A

Structure has full sprinkler system? Yes____ No X Alarm System? Yes X No____
Sprinkler & Alarm systems must be installed according to BOCA and NFPA Standards with approval from the Portland Fire Department.

Is structure being considered unlimited area building: Yes____ No X

If mixed use, what subsection of 313 is being considered N/A

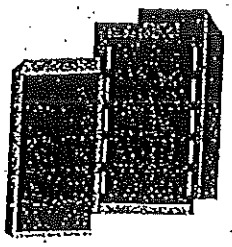
List Occupant loading for each room or space, designed into this Project.

Drill Hall (only) 200-300

STATE OF MAINE
WILLIAM P FAUCHER
#7133
REGISTERED PROFESSIONAL ENGINEER

(Designers Stamp & Signature)

PSH 6/07/2K



CITY OF PORTLAND
BUILDING CODE CERTIFICATE
389 Congress St., Rm 315
Portland, ME 04101

TO: Inspector of Buildings City of Portland, Maine
Department of Planning & Urban Development
Division of Housing & Community Service

FROM: allied engineering, inc.

RE: Certificate of Design

DATE: April 29, 2003

These plans and/or specifications covering construction work on:

Armory reroofing/structural upgrade - Stevens Avenue Armory,

Portland, Maine Drill Hall project No. AP03-063C

Have been designed and drawn up by the undersigned, a Maine registered architect/engineer according to the BOCA National Building Code/1999 Fourteenth Edition and local amendments.

(SEAL) STATE OF MAINE — WILLIAM P FAUCHER #7133 — REGISTERED PROFESSIONAL ENGINEER

Signature William P. Faucher

William P. Faucher, P.E.

Title Principal

Firm allied engineering, inc.

Address One Westbrook Common
Westbrook, ME 04092

As per Maine State Law:

$50,000.00 or more in new construction, repair, expansion, addition, or modification for Building or Structures, shall be prepared by a registered design Professional.

PSH 6/20/2k