City of Portland

Public Buildings Division

Portland High School
Community Health Clinic Renovations

May 12, 2013

Bid #7713

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BID #7713

Notice to Contractors

Portland High School Community Health Clinic Renovations

Sealed bids will be received at the Purchasing Office, Room 103, City Hall, 389 Congress Street, Portland, Maine 04101, until 3:00 P.M., Tuesday, June 4, 2013 at which time they will be publicly opened, for:

Project Name: Portland High School Community Health Clinic Renovations
Bid #77

Location: 284 Cumberland Avenue
Portland, Maine

Outline of Work: Briefly and without force and effect upon the contract documents, the work of the contract can be summarized as follows: furnishing all the labor, materials, equipment, and incidentals necessary to convert existing classroom and storage space into a Health Clinic with bathrooms.

MANDATORY PRE-BID CONFERENCE

It is mandatory that all prospective bidders attend a pre-bid meeting that will be held at the site on Wednesday, May 22, 2013, at 10:00 A.M. Only those firms represented at this meeting may bid on the project.

Acquisition under this bid will be funded by Federal Grants and will be subject to all applicable requirements of the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA). This purchase is subject to the Federal government's "Buy American Act".

In the event of inclement weather, please check the local media outlets, the City of Portland Purchasing website (www.portlandpurchasing.com) and/or call the City's Purchasing Office, 207-874-8654 regarding any postponement. If Portland Schools and/or City operations have been cancelled, any scheduled pre-bid meetings will be cancelled as well. NOTE: Every effort will be made to provide as much forewarning as possible regarding these decisions.

Copies of the above documents will be available at the Purchasing Office, Room 103, City Hall, 389 Congress Street, Portland, ME 04101, upon payment in advance of $50.00 for each set of plans and specifications or $75.00 for each set of plans and specifications to be mailed. Each prospective bidder will be required to obtain from the City each copy of the proposal form and each set of plans; e-mail jrl@portlandmaine.gov, or phone (207) 874-8654, fax (207) 874-8652.

CITY OF PORTLAND, MAINE

CITY OF PORTLAND, MAINE

PORTLAND HIGH SCHOOL
COMMUNITY HEALTH CLINIC RENOVATIONS

Notice to Bidders

Sealed bids for the above project, addressed to Purchasing office, City Hall, Room 103, 389 Congress Street, Portland, Maine 04101, and clearly marked on the outside of the envelope with the name of the bidder, project title and bid number, will be received **until 3:00 PM on Tuesday, June 4, 2013**, at which time they will be publicly opened.

MANDATORY PRE-BID MEETING

There will be a **mandatory pre-bid meeting on Wednesday, May 22, 2013 at 10:00am**. This meeting will commence at the site 284 Cumberland Avenue, Portland, Maine. Interested bidders shall meet a City Representative at the site. Only those firms represented at this meeting will be allowed to submit a bid on this project.

In the event of inclement weather, please check the local media outlets, the City of Portland Purchasing website (www.portlandpurchasing.com) and/or call the City's Purchasing Office, 207-874-8654 regarding any postponement. If Portland Schools and/or City operations have been cancelled, any scheduled pre-bid meetings will be cancelled as well. NOTE: Every effort will be made to provide as much forewarning as possible regarding these decisions.

All questions shall be directed in writing ONLY to the Purchasing Office at the above address and be received at least five (5) business days prior to the bid opening date (FAX 207-874-8652, or email mff@portlandmaine.gov. Responses from the City that substantially alter this bid will be issued in the form of a written addendum to all bid holders registered in the Purchasing Office. Oral explanations or interpretations given before the award of the contract will not be binding.

Bids from vendors not registered with the Purchasing Office may be rejected; receipt of this document directly from the City of Portland indicates registration. Should a vendor receive this Invitation from a source other than the City, please contact 207-874-8654 to ensure that your firm is listed as a vendor for this project.

All bids shall be submitted on the attached form and are to remain open for sixty (60) days after their opening. Late, faxed or bids submitted electronically will be rejected.

This bid will be awarded to the bidder that submits the lowest base bid amount.

The successful bidder shall agree to defend, indemnify and save the City harmless from all losses, costs or damages caused by its acts or those of its agents, and, before signing the contract, will produce evidence satisfactory to the City's Corporation Counsel of coverage for General Public and Automobile Liability insurance in amounts not less than $400,000 per person, for bodily injury, death and property damage, protecting the contractor and the City, and naming the City as an additional insured from such claims, and shall also procure Workers' Compensation insurance. The City disclaims any and all responsibility for injury to contractors, their agents or others while examining the job or at any other time.

The successful bidder shall supply the City with a Performance Bond and Labor and Material Payment Bond, each in the amount of the contract price, guaranteeing one hundred percent (100%) performance of the contract, including the guarantee period and free and clear of any and all liens, attachments and encumbrances. All bonds shall comply with the requirements of Maine state law.

Materials and equipment purchased for permanent installation in this project are exempt from the State of Maine Sales and Use tax and from all Federal Excise taxes. Each bidder shall take this exception into account in calculating his bid price for the work.

Acquisition under this bid will be funded by Federal Grants and will be subject to all applicable requirements of the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA). This includes compliance with the Davis-Bacon Act, and prevailing wage rates, certified payrolls, etc. Further, this purchase is subject to the Federal government's "Buy American Act".

The contractor shall furnish all labor, materials, fixtures, supplies, equipment and transportation necessary to do the work as specified. The contractor affirms that the equipment, or work, shall be in full compliance with any and all applicable O.S.H.A., D.O.T., ANSI, Federal, State and/or municipal regulations. **Contractors will be responsible for acquiring all necessary permits (permit fees waived), licenses and pay all associated fees (including dump disposal fees and disposal taxes, if applicable), unless otherwise specified herein.**

The contractor shall erect and maintain, at all times, any and all safeguards necessary for the protection of life and property of all pedestrian and vehicular traffic. Note that this project will require care by the contractor to limit the disruption with workers arriving and departing the building by vehicle or on foot. The contractor may be responsible to submit a traffic control plan with this in mind. No additional payment or costs will be made to the contractor for this work.

It is the custom of the City of Portland, Maine to pay its bills 30 days following delivery of items, their acceptance, and receipt of invoices for, all items covered by the Purchase Order(s). In submitting bids under these specifications bidders should take into account all discounts, both trade and time allowed in

accordance with this payment policy and quote a net price. The City is exempt from the State's Sales and Use Tax and from all Federal Excise tax.

Equal Employment Opportunities. Vendor shall comply fully with the Nondiscrimination and Equal Opportunity Provisions of the Workforce Investment Act of 1998, as amended (WIA, 29 CFR part 37); the Nontraditional Employment for Women Act of 1991; title VI of the Civil Rights Act of 1964, as amended; section 504 of the Rehabilitation Act of 1973, as amended; the Age Discrimination Act of 1975, as amended; title IX of the Education Amendments of 1972, as amended; and with all applicable requirements imposed by or pursuant to regulations implementing those laws, including but not limited to 29 CFR part 37.

The City reserves the right to waive any informalities in bids, to accept any bid or portions thereof (bidders are advised to note this and quote accordingly) and to reject any or all bids should it be deemed for the best interest of the City to do so. The City reserves the right to substantiate the bidder's qualifications, capability to perform, availability, past performance record and to verify that the bidder is current in its obligations to the City, as follows:

Pursuant to City procurement policy and ordinance, the City is unable to contract with businesses or individuals who are delinquent in their financial obligations to the City. These obligations may include but are not limited to real estate and personal property taxes and sewer user fees. Bidders who are delinquent in their financial obligations to the City must do one of the following: bring the obligation current, negotiate a payment plan with the City's Treasury office, or agree to an offset which shall be established by the contract which shall be issued to the successful bidder.

May 12, 2013

Karen C. Marston
Assistant Purchasing Manager

BID #7713

PROPOSAL

Proposal of _____

Name

_____

Address

The name and address shown on the above lines shall be the official name and address of the person, partnership or corporation submitting this bid and shall agree with the "Signature of Bidder" in the case of an individual; the "Name of Firm or Partnership" in the case of a firm or partnership; the "Name of Bidder" in case of a corporation.

TO: Karen C. Marston, Assistant Purchasing Manager
City Hall, Room 103
389 Congress Street
Portland, ME 04101

The undersigned having carefully examined the site of the work; the Plans; Standard Specifications, including all current amendments or revisions there of; the Supplemental Specification, Special Provisions; Contract Agreement and Contract Bonds, where applicable, contained herein for the **Portland High School Community Health Clinic Renovations** on which proposals will be received until the time specified in this bid document; and in case of award, do(es) hereby propose and offer to enter into a contract to supply all the materials, tools, equipment and labor required to perform and construct the whole of the work in strict accordance with the terms and conditions of this contract at lump sum price stated in the following Price Proposal Page submitted by the undersigned.

This Proposal may be accepted by the City of Portland at any time within sixty (60) calendar days after opening of the bids.

BID #7713

PRICE PROPOSAL

The undersigned having examined the attached document do(es) hereby propose and offer to enter into a contract to supply all the materials, tools, equipment and labor required to perform and construct the whole of the work in strict accordance with the terms and conditions of this contract at the price stated in the following Proposal:

BASE BID
LUMP SUM PRICE: $_____

(Award Basis)

TIME FOR COMPLETION FROM START OF WORK: _____

WARRANTY OF LABOR: _____

WARRANTY OF MATERIALS: _____

The undersigned also agrees as follows:

FIRST: To do any extra work which may be ordered, and to accept as full compensation therefore such prices as may be agreed upon in writing by the Engineer and the Contractor; or in case no agreement is made, to accept as full compensation the amount determined upon a "force account" basis as provided in the M.D.O.T. Standard Specifications, Revision of December, 2002.

SECOND: To begin work on the date specified in the Engineer's "Notice to Commence Work" as mutually agreed and to prosecute said work in such a manner as to complete it in the time stated on this proposal.

THIRD: That this offer is to continue open to acceptance until the formal contract is executed by the successful bidder of this work, and the City may at any time without notice accept this proposal whether any other proposal has previously been accepted or not. Provided, however, that the City will accept, in writing, one of the proposals made, or reject all proposals made, within sixty (60) calendar days after the date of opening of the proposals.

The undersigned as Bidder, declares that the only persons or parties interested in this Proposal are those named herein; that the bidder is not financially interested in, or otherwise affiliated in a business way with any other bidder on this contract; and that this Proposal is made without collusion with any other person, firm or corporation.

The undersigned declares that any person(s) employed by the City of Portland, Maine, who has direct or indirect personal or financial interest in this proposal or in any portion of the profits which may be derived therefrom, has been identified and the interest disclosed by separate attachment. (Please include in your disclosure any interest which you know of. An example of a direct interest would be a City employee who would be paid to perform services under this proposal. An example of an indirect interest would be a City employee who is related to any officers, employees, principal or shareholders of your firm or you.) If in doubt as to status or interest, please disclose to the extent known.

Respectfully submitted this _____ day of _____, 20 _____

IF AN INDIVIDUAL, SIGN HERE

Signature of Bidder _____

Address _____

_____

Telephone Number_____ Fax Number _____

Social Security Number :_____

(Signatures for a Firm, Partnership or Corporation on next page.)

PROPOSAL (continued)

IF A FIRM OR PARTNERSHIP, SIGN HERE

Signature of Bidder _____

Name of Firm or Partnership _____

Business Address _____

_____

Telephone Number_____ Fax Number _____

Social Security or Tax ID Number: _____

Names and Addresses of Members of Firm or Partnership:

_____

_____

_____

IF A CORPORATION, SIGN HERE

Name of Bidder _____

Authorized Signature _____
(name) (title)

Business Address _____

_____

Telephone Number_____ Fax Number _____

Tax ID Number :_____

Incorporated under the Laws of the State of _____

Names and Addresses of Officers of the Corporation:

President _____

Secretary _____

Treasurer _____

_____ ss

Before me, personally appeared _____ and acknowledged that the signature to the preceding bid is his/her signature in his/her official capacity.

Date: _____

_____

Notary Public - Signature and Seal

BID #7713

ALL CORPORATIONS MUST SIGN THIS FORM
AND SUBMIT WITH THE BID PROPOSAL

(Insert copy of that part of the records of the corporation wherein authority is given to the officer of that corporation to sign this bid on behalf of the corporation.)

_____

_____

_____

_____

_____
(date)

The above is a true copy of the records of the _____

Corporation, which records are in my legal custody.

_____
Officer having custody of the records

_____ss

Before me appeared, _____, _____

_____ of the _____ Corporation, and made

oath that the above statement is true.

_____
Notary Public - Signature and Seal

BID #7713

NOTICE

(This Must Be Filled Out)

The full names and residences of all persons interested in this bid as principals are as follows: (In case of Corporation, include and identify President, Treasurer, Manager)

_____	_____
_____	_____
_____	_____

BID #7713

ALL CONTRACTORS SHALL FILL IN THE FOLLOWING INFORMATION BEFORE SUBMITTING BID

	Name and Address of Supplier	Products to be Supplied
1		
2		
3		
4		
5		
6		

	Name and Address of Contractor	Service or Trades to be Supplied	Anticipated $ Amount
1			
2			
3			
4			
5			
6			

This is a Sample Contract or Agreement ONLY; the final terms and conditions in the actual Agreement will be determined by the City's Corporation Counsel Office, and may contain additional provisions.

[SAMPLE]
AGREEMENT BETWEEN THE
CITY OF PORTLAND
AND

_____

(CONTRACTOR)

AGREEMENT entered into this _____ day of _____, 2013 by and between the **CITY OF PORTLAND,** a body politic and corporate, (hereinafter the **"CITY"**), and _____, located at _____ (hereinafter the **"CONTRACTOR"**).

W I T N E S S E T H

WHEREAS, the **CITY** did advertise by **Bid #7713**, entitled **Portland High School Community Health Clinic Renovations**, and

WHEREAS, the **CONTRACTOR** did, under date of May 12, 2013, submit a Bid for such work; and

WHEREAS, after due consideration of all the Proposals, the **CITY** did award the Bid to the **CONTRACTOR**;

NOW THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The **CONTRACTOR** shall furnish all labor, materials, fixtures, supplies, equipment and transportation and shall perform all work required for the construction and completion of the **Portland High School Community Health Clinic Renovations** project in accordance with the specifications contained in the contract documents entitled Portland High School Health Clinic Renovations, Bid #7713, dated May 12, 2013 (hereinafter referred to as "Contract Documents") of which this Agreement is a part. All work shall be performed in strict conformance with the provisions of this Agreement, the Invitation for Bids, the **CONTRACTOR**'s Proposal, and any and all General and Detailed Provisions and Plans.
2. It is agreed that the amount(s) given on the Proposal Page in the **CONTRACTOR**'s Proposal Section of the Contract Documents will be used as the basis for determining the amount due under this Contract Agreement and for establishing the amount of the required Contract Performance Surety Bond and Contract Payment Surety Bond, and that the amount due under this Agreement so determined is _____ _____ ($_____) (hereinafter referred to as the "Contract Price").

The **CITY** will have the right to increase or decrease the amount and extent of the work by giving reasonable notice in writing to the **CONTRACTOR**.

3. **CONTRACTOR** covenants and agrees that all work performed and materials used shall be free from all defects, and that all work be performed as specified.

4. The **CITY** reserves the right to require Waivers of Lien from subcontractors and/or suppliers prior to each progress payment made to **CONTRACTOR** pursuant to the terms of this Agreement.

5. Prior to the execution of this Agreement, **CONTRACTOR** shall procure and maintain Public Liability Insurance coverage and Automobile Insurance coverage in amounts of not less than Four Hundred Thousand Dollars ($400,000.00) combined single limit and aggregate for bodily injury, death, and property damage, naming the **CITY** as an additional insured thereon, and shall also procure Workers' Compensation Insurance coverage. **CONTRACTOR** shall furnish and thereafter maintain certificates evidencing such coverage, which certificates shall guarantee thirty (30) days' notice of termination of insurance from insurance company or agent.

6. Prior to the execution of this agreement, **CONTRACTOR** shall supply the City with a Performance Bond and Labor and Material Payment Bond, each in the amount of the contract price, guaranteeing one hundred percent (100%) performance of the contract, including the guarantee period and free and clear of any and all liens, attachments and encumbrances. All bonds shall comply with the requirements of Maine state law.

7. To the fullest extent permitted by law, the **CONTRACTOR** shall defend, indemnify and hold harmless the **CITY**, its officers and employees, from and against all claims, damages, losses, and expenses, just or unjust, including but not limited to the costs of defense and attorneys' fees arising out of or resulting from the performance of the Agreement, provided that any such claims, damage, loss or expense (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property, including the loss of use therefrom, and (2) is caused in whole or in part by any negligent act or omission of the **CONTRACTOR**, anyone directly or indirectly employed by it, or anyone for whose act it may be liable.

8. Upon receipt of executed contracts and insurance as required, the **CITY** will promptly send an executed **CITY** contract and a "Notice to Commence Work" to the **CONTRACTOR.** The **CONTRACTOR** agrees to perform no work under this Agreement until it receives said Notice and to complete the work in the time specified by the contractor on the Proposal Page; that date/time is: _____. The time set for such completion may be extended only by written consent of the Director of Public Buildings for City of Portland (hereinafter referred to as the **"DIRECTOR"**).

9. The **CONTRACTOR** shall perform the work to the satisfaction of the responsible **CITY** official who will have the right of inspection at all times, and whose approval and acceptance of the work will be a condition precedent to payments by the **CITY** under this Contract. **CITY** inspectors will have the authority to stop work in progress if such work is being done contrary to the plans, specifications, or engineering practice.

10. In the event that any dispute as to the amount, nature or scope of the work required under this Contract, the decision and judgment of the responsible **CITY** official will be final and binding.

11. The **CONTRACTOR** shall guarantee the work for a period of one (1) year for the faithful remedy of any defects due to faulty materials or workmanship and payment for any damage resulting therefrom.

12. **CONTRACTOR** shall keep accurate records of all services performed under this Agreement and shall submit such information to the **CITY** on a monthly basis. Payment for such services shall be made to **CONTRACTOR** not more than thirty (30) days after receipt of said forms and acceptance of the work by the **DIRECTOR.**

13. The **CITY** may terminate this Agreement for cause by written Notice to the **CONTRACTOR.** In the event of such termination, **CONTRACTOR** shall not be entitled to any further payment under this Agreement from the date of receipt of said Notice.

14. The **CITY** will have the right to terminate this Agreement at any time for its convenience on prior written Notice to **CONTRACTOR**. If Agreement is terminated by the **CITY** for convenience, the **CITY** will pay the **CONTRACTOR** for all work performed and all materials purchased pursuant to this Agreement prior to receipt of said Notice.

IN WITNESS WHEREOF, the said **CITY OF PORTLAND** has caused this Agreement to be signed and sealed by Mark H. Rees, its City Manager, thereunto duly authorized, and _____ has caused this Agreement to be signed and sealed by _____, its _____, thereunto duly authorized, the day and year first above written.

WITNESS

_____

CITY OF PORTLAND

BY: _____
Mark H. Rees
Its City Manager

CONTRACTOR

_____

By: _____

_____
(Print or type name)

Its _____

Approved as to Form:

_____
Corporation Counsel's Office

Approved as to funds:

_____
Budget Office

HCD Approval:

_____
HCD Administrator

BID #7713

Portland High School
Community Health Clinic Renovations
May 12, 2013

Project Dates

1. Contract time for the Work may commence on or around June 19, 2013 and must be complete by August 23, 2013.
2. Contract time for the Work scheduled at City of Portland owned facilities will be subject to Owner's review and approval of Contractor's submitted schedule.
3. Bid due date for the Work will be 3:00 EST, Tuesday, June 4, 2013.
4. Technical Questions concerning the bid must be submitted in writing no later than 12:00 noon, Tuesday, May 28, 2013.

Additional Requirements

1. Contractor is responsible for complying with all OSHA regulations.
2. Contractor shall provide a Site Specific Safety and Health Plan (SSHP) prior to project construction.
3. All installation work shall comply with the current state and local codes and regulations.
4. After construction is complete, a total of three (3) copies of all documentation, and warranties shall be provided.
5. Three (3) complete copies of maintenance manuals shall be provided
6. Bidders are reminded that this work is funded through a grant from the US Department of Health & Human Services and is therefore, subject to Davis-Bacon prevailing wage rates and the "Buy American" clauses.

SECTION 1 - GENERAL

1.1 DESCRIPTION

Briefly and without force and effect upon the contract documents, the work of the contract can be summarized as follows: furnishing all the labor, materials, equipment, and incidentals necessary to convert existing classroom and storage space into a Health Clinic with bathrooms.

1.2 SCOPE OF WORK

The scope of work includes providing all labor, material, tools, equipment, and supervision necessary to complete the following:

A. Selective demolition of work area in preparation for construction.

B. Construction of work area with all necessary cutting, patching, HVAC, plumbing, electrical, sprinkler revisions, walls, concrete slab cutting and finishing, metal studs, ceilings, finishes, doors/hardware, and related work identified in plans and specs.

C. Final installation and hookups of all fixtures and finishes as shown on drawings and identified in specifications.

1.3 CONSTRUCTION DOCUMENTS SUBMITTALS

A. Prior to starting the work, the Contractor must submit all required shop drawings showing layout, details of construction and identification of materials. Reference attached technical specifications for details and additional requirements.

B. Submittal Schedule: Within (2) weeks of authorization to proceed, submittal a submittal schedule to the design team indicating all action submittals required for the project; submittal schedule shall accommodate review durations indicated below or in the technical specifications, whichever is more lengthy.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineers receipt of submittal.

D. Review: Allow 14 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals.

E. Incomplete submittals will not be reviewed.

F. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor,

representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with.

G. Hardcopy Submittals: Submit three prints. Prints will be reviewed by the Engineer, and then the Architect when required. One marked print will be returned to Contractor for printing and distribution. Multiple copies will not be marked by the Engineer.

H. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

I. Copies: Unless otherwise noted, submit (3) three copies of Action submittals for review by the Engineer. One copy will be returned. Provide Owner with a duplication of the returned copy.

J. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the Owner prior to issuance of the manufacturer's warranty.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Limited storage area will be provided by Owner, where available. Supply temporary storage required for storage of equipment and materials for duration of Project. Utilize only areas designated by Owner's Representative for storage.

B. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.

C. Comply with the manufacturer's written instructions for proper materials storage.

1. Store materials within temperature ranges complying with manufacturer's recommendations, in dry areas protected from water and direct sunlight. If exposed to temperatures lower or higher than this the installer must restore to this range before using.

2. Store materials containing solvents or cements in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use all products before expiration of their shelf life.

D. All materials must be stored on pallets, off the ground and tightly covered with waterproof materials.

E. Any materials which are found to be damaged shall be removed and replaced at the installer's expense.

F. Substitutions:

1. Substitution Requests: Within 2 weeks of notice to proceed, submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

2. Engineers/Owners Action: If necessary, Engineer and/or Owner will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

1.5 BUILDING OCCUPANCY AND USE OF PREMISE

A. Owner will occupy premises during periods of construction for the conduct of his normal operations. Cooperate with Owner to minimize conflict and to facilitate Owner's operations. Interior spaces and facilities may not be utilized unless Owner's permission is requested and granted.

B. Predetermine and obtain approval, in advance from Owner, for vertical and horizontal transportation of labor and construction materials onto and out of the building.

C. Before beginning work Contractor must secure approval from the Owner for the following.

1. Access to the site.

2. Areas permitted for storage of materials and debris.

3. Areas permitted for the location of cranes, hoists and chutes for loading and unloading materials to and from the roof.

1.6 CONTRACTOR USE OF PREMISES

A. Contractor will limit use of premises to allow for continuous, uninterrupted Owner occupancy and use. Dumpsters, scaffolds, ladders, staging or any other equipment will be only as permitted by the Owner's Representative.

B. Coordinate use of premises under direction of Owner's Representative.

C. Assume full responsibility for protection and safekeeping of products stored on-site under this Contract.

D. Obtain and pay for use of secured additional storage or work areas needed for operations under this Contract.

E. Maintain all exits from the building as fire exits. Should it be necessary, the Contractor will stop work during facility functions and allow use of all egresses from the building.

F. Keep all drive lanes open at all times.

1.7 TEMPORARY UTILITIES, FACILITIES AND CONTROLS

A. Temporary Utilities:

1. Water and power for construction purposes will be made available at the site and will be made available to the Contractor. No lighting for construction purposes will be made available to the Contractor.

2. Contractor must provide all hoses, valves and connections for water from the source designated by the Owner when made available.

3. When available electrical power should be extended as required from the source designated by the Owner. Contractor must provide all trailers, connections and fused disconnects.

B. Temporary Sanitary Facilities:

1. Sanitary facilities will not be made available at the job site. The Contractor shall be responsible for the provision and maintenance of portable toilets or their equal.

C. Building Site:

1. The Contractor shall use reasonable care and responsibility to protect the building and site against damages. The Contractor shall be responsible for the correction of any damage incurred as a result of the performance of the contract.

2. The Contractor shall remove all debris from the job site in a timely and legally acceptable manner so as to not detract from the aesthetics or functions of the building.

D. Security:

1. Obey the Owner's requirements for personnel identification, inspection and other security measures.

1.8 JOB SITE PROTECTION

A. The Contractor shall adequately protect building, paved areas, service drives, lawns, shrubs, trees, etc. from damage while performing the required work. Provide canvas, boards and sheet metals (properly secured) as necessary for protection and remove protection materials as work is completed. The Contractor shall repair or be responsible for costs to repair all property damaged during the work.

B. During the Contractor's performance of the work, the building Owner will continue to occupy the existing building. The Contractor shall take all precautions to prevent the spread of dust and debris, particularly where such material may sift into the building. The Contractor shall provide labor and materials to construct, maintain and remove necessary, temporary enclosures to prevent dust or debris in the construction areas from entering the remainder of the building.

C. Do not overload any portion of the building, by either use of or placement of equipment, storage of debris, or storage of materials.

D. Protect against fire and flame spread. Maintain proper and adequate fire extinguishers.

E. Take precautions to prevent drains from clogging during the work. Remove debris at the

completion of each day's work and clean drains, if required. At completion, test drains to ensure the system is free running and drains are watertight. Remove strainers and plug drains in areas where work is in progress. Install flags or telltales on plugs. Remove plugs each night and screen drain.

F. Store moisture susceptible materials above ground and protect with waterproof coverings.

G. Remove all traces of piled bulk material and return the job site to its original condition upon completion of the work.

1.9 WORKING HOURS AND SCHEDULE

A. Construct work in stages to accommodate Owner's use of premises during construction. Coordinate progress schedule and coordinate with Owner's Representative occupancy during construction. Contractor's daily work areas must be coordinated with and approved by the Owner's Representative, prior to any work commencing in that area. Submit work schedule to Owner's Representative. Normal working hours shall be between the hours of 7:00 a.m. and 7:00 p.m., seven days a week, except holidays.

B. Construct work in stages to provide for continuous public usage. Do not close off public access to facility.

C. Obtain approval from Owner prior to altering Work schedule.

1.10 CONSTRUCTION SCHEDULE

A. The Contractor's Construction Schedule shall clearly identify the on-site crew foreman and the size of the crew to be utilized for each site. The crew size shall remain consistent and work shall be continuous throughout the project, from start-up to completion.

B. The Owner's Representative shall review the Contractor's Construction Schedule prior to the start of any work. After defining the location(s) of the work progress, the Owner's Representative shall arrange to control occupancy in the facilities to the greatest extent possible. It shall be the responsibility of the Contractor to supply the Owner's Representative with written notice, 24 hours in advance, if his work location(s) for a workday is different from the schedule. The Contractor shall update his Construction Schedule weekly and submit a copy to the Owner's Representative for review.

C. Schedule shall be updated on a bi-weekly basis; present the updated schedule at a biweekly project meeting with the project Owner.

1.11 PRE-JOB DAMAGE SURVEY OF FACILITY

A. Perform a thorough survey of property and all affected areas of the building with Owner's Representative prior to starting the work in each area to document existing damage and operational status of existing equipment. Items identified on this list will not be the responsibility of Contractor unless further damaged by Contractor during execution of Work.

1.12 CORRECTION OF DAMAGE TO PROPERTY

A. Consider any damage to building or property not identified in the pre-job damage survey as having resulted from execution of this Contract and correct at no additional expense to Owner.

1.13 SAFETY

A. The Contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related. Safety shall be the responsibility of the Contractor. All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, students, customers and the occurrence of the general public on or near the site.

1.14 WORKMANSHIP

A. The Contractors installing new systems and related work shall be factory trained and approved by the manufacturer they are representing.

B. All work shall be of the highest quality and in strict accordance with the manufacturer's published specifications and to the building Owner's satisfaction.

C. There shall be a supervisor on the job site at all times while work is in progress.

1.15 QUALITY ASSURANCE

A. Unless otherwise noted in this specification, the Contractor must strictly comply with the manufacturer's current specifications and details.

B. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and an experienced superintendent on the job at all times work is in progress.

C. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the Owner. Any deviation from the manufacturer's installation procedures must be supported by written certification on manufacturer's letterhead and presented for the Owner's consideration.

D. Owner may implement a quality assurance program including material testing and/or inspection by the Engineer; work found not in compliance with the project documents, submittals and specifications shall be corrected at no cost to the Owner.

1.16 PROJECT CONDITIONS

A. The facilities will be occupied and in use during construction. Take any necessary precaution to create as little disturbance or disruption to the facilities and their occupants as possible during the work.

B. Supply, install and maintain barriers, protection, warning lines, lighting and personnel required

to segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the facilities, their occupants, and the surrounding landscaped and paved areas. All applicable O.S.H.A., City of Portland, State of Maine and Federal requirements shall be observed by the Contractor. In all instances the more stringent requirements will apply.

C. Schedule and execute work without exposing the facilities interiors to the effects of inclement weather. Protect the facilities and their occupants against such risks, and repair/replace work-related damage to the Owner's satisfaction.

D. Proceed with work only when weather conditions are in compliance with the manufacturer's recommendation limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirement and recommendations.

E. Phased or temporary construction will not be permitted. Schedule, execute and coordinate work on a daily basis so that components are installed completely and permanently as specified.

F. Supply shoring, supports and other items or materials necessary to brace existing work to remain or as required to install new work including arches and other assemblies. Support the structure, fixtures and facilities affected by the work.

G. All work shall be performed in accordance with applicable Federal, State and local code requirements. In all instances the more stringent requirements will apply.

H. All workmanship and materials shall be of the best construction practice. Specification requirements, which exceed the minimum requirements of the manufacturer, shall be complied with by the Contractor. In all instances the more stringent requirements will apply.

I. Coordinate the work in this Section, including preparatory work, building protection, daily clean up and protection of building occupants.

J. Supply labor, vacuums, tools and appliances necessary to keep the interior and exterior facilities and site areas below and around the area of work clean, with as little accumulation of dust and debris as possible on a daily basis.

1.17 EMERGENCY RESPONSE

A. The Contractor shall provide the Owner with after-hours (24 hour), emergency cell phone numbers of the Contractor's Superintendent and Foreman.

B. The Contractor must respond to emergency situations or calls within two (2) hours.

1.18 SCHEDULE OF VALUES

A. Provide a line item breakdown conforming to the standard 16 division specification breakdown of construction labor and materials costs.

1.19 CONTRACT MODIFICATIONS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

B. Contractor Change Proposals: Within 10 days of receipt of an Owner-Initiated Proposal Request, the Contractor shall submit a Contractor Change Proposal for Owner review and approval. Change Proposals shall include the following information without exception:

1. Sub contractor proposal (when applicable) on company letterhead clearly showing a breakdown of all materials, associated labor and mark up.

2. General Contractor proposal showing a breakdown of all materials, associated labor and mark up.

3. A breakdown of associated bonding fees (if applicable).

4. A description of impact on the construction schedule (if applicable).

1.20 PROGRESS MEETINGS

A. Progress meetings may be scheduled as determined by the Owner and/or Owner's Representative not more than once weekly.

1.21 DIMENSIONS AND QUANTITIES

A. Verify dimensions and quantities in the field prior to bid submission. The scope has been compiled from various sources and may not reflect the actual field conditions, sizes and/or quantities at the time of construction.

B. The Contractor is solely responsible for means and methods of construction. Make necessary investigations (including sampling) and take necessary precautions to properly supply, fabricate, and install work.

C. Unfamiliarity with existing project conditions will not be considered as a basis for additional compensation.

D. In case of inconsistency between this document and product Manufacturers Specifications or within either document, the better quality and/or greater quantity of work shall be provided, as determined by the Owner's Representative.

1.22 MATERIAL SAFETY DATA SHEETS

A. Material safety data sheets (MSDS) shall be submitted in complete sets for all products to be used prior to any work being performed.

1.23 HAZARDOUD MATERIALS REPORT

A. Hazardous materials testing, within the work area, for content of Asbestos-Containing Building Materials & Lead-Based Paint has been conducted within the area of Work prescribed within this document and a copy of the report is included in this document.

1.24 WARRANTY

A. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

1.25 FEDERAL REQUIREMENTS

The Contractor must comply with all the Safety and health Regulations (CFR29 part 1926 and all subsequent amendments) as promulgated by the US Department of Labor on June 24, 1974, the Department of Labor Regulations relating to Copeland Anti-Kickback Act (18 U.S.C. 874) as supplemented by 29 CFR part 3, Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by 29 CFR part 5, and Occupational Safety and Health Standards (OSHA) (29 CFR part 1910). The Contractor must comply with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h)), section 508 of the Clean Water Act (33 U.S.C. 1368), and Executive Order 11738.

The Contractor must comply with all requirements of the Department of Health & Human Services – Health Resources and Services Administration Grant Program and Stafford Act. These include but are not limited to the Buy American clause in the Act and Federal Wage Rates (Davis-Bacon).

The Contractor must comply with the Buy American Provision of the Stafford Act.

1. American Iron, Steel, and Manufactured Goods, the Stafford Act requires that none of the appropriated funds may be used for the construction, alteration, maintenance, or repair of a public building or public work unless all of the iron, steel, and manufactured goods used in the project is produced in the United States unless a waiver is provided to the Owner by the City's funding entity. In order to receive a waiver, the Owner must send a written request to the Funding Administrator.

    a. A decision will be made based on the following criteria: 1) The requirement is inconsistent with the public interest for purposes of the project for which a waiver has been requested, 2) Iron, steel, and necessary manufactured goods are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality, or 3) Inclusion of iron, steel, and manufactured goods produced in the United States will increase the overall cost of the project by more than 25 percent.

2. If a waiver is granted by the Administrator, funding agency will publish such waiver, with a sufficient explanation, in the Federal Register. Funding agency will provide additional guidance on this provision as it becomes available.

Payment of Employees

Federal Wage Rates

Federal Wage Rates, Davis-Bacon Act as amended apply to this project. All laborers and mechanics employed by contractors or subcontractors, including employees of other governments, on construction work assisted under this contract, and subject to the provisions of the federal acts and regulations listed in this paragraph, shall be paid wages at rates not less than those prevailing on similar construction in the locality as determined by the Secretary of Labor in accordance with the Davis-Bacon Act. It is the responsibility of the Contractor, before bid opening, to request, if necessary, any additional information on Wage Rates for those trades' people who are not covered by the applicable Wage Rates, but who may be employed for the proposed work under this contract. Refer to Attachment A for prevailing Wage Rates.

When requesting an additional wage classification and rate, the bidder should take special notice to *A Contractor's Guide to Prevailing Wage Requirements for Federally-Assisted Construction Projects*, Chapter 2, Section I, 2-2, Additional "Trade" Classifications and Wage Rates. In accordance with paragraph a.3) of this section, one of the conditions for approval of the proposed wage rate is that it "fits" with the other wage rates already on the wage decision. The bidder should be aware and take into consideration when preparing the bid, that in previous requests for additional classifications and rates, the Department of Labor has set the minimum acceptable wage rate to be no less than the minimum wage rate in comparable categories already on the determination for Cumberland County. In that regard, the wage rate approved for a trade classification such as a Flagger would be at least as much as the lowest wage rate on the determination under the minor classification group of Laborers. This would result in a Flagger wage rate of $XX.XX per hour plus $X.XX per hour for fringes even though this rate is higher than typical rates for Flaggers in this area. To avoid disputes later, the Bidders are expected to base their costs on the assumption that this higher rate may be required. The Owner will not entertain any later change order requests for bids that are based on any lower assumed rate for Flaggers.

Overtime Payments

An employer is obligated to make proper wage payments under the Fair Labor Standards Act, and the Contract Work Hours Standards Act, for hours worked in excess of 40 hours in a work week. An employee must receive compensation at a rate not less than one and one-half times the regular rate of pay (basic hourly rate) for all hours worked in excess of 40 hours per week.

Wage Record of Contractor

The CONTRACTOR and each of subcontractor shall keep an accurate record showing the names, social security number, and occupation of each and all laborers, workmen, and mechanics employed by them in connection with this Project showing the hours worked, the title of the job, the hourly rate and the actual wages paid to each of them. A copy of such record shall be kept at the job site and shall be open at all reasonable hours to the inspection of the Bureau of Labor Standards, and the OWNER.

Retention of Payroll Records

Payroll records, including original field notes and back up material will be maintained during the course of the work by the CONTRACTOR, including payroll of each subcontractor for a period of three years after the completion of the project.

Posting Documents

The following documents must be posted and maintained by the CONTRACTOR at such place or places on the PROJECT site where employees can easily see them. The posters may be obtained, free of charge, from "Business Answers" 1-800-872-3838.

1. "Notice To All Employees Working On Federal or Federally Financed Construction Projects (Davis-Bacon Act)
2. "Equal Employment Opportunity is the Law" poster
3. "Job Safety and Health Protection" poster
4. "Employee Polygraph Protection Act" poster
5. "Family and Medical Leave Act" poster (applicable to employers of 50 or more employees)
6. "Fair Labor Standards Act – Federal Minimum Wage" poster
7. "Notice Relative to the Regulation of Employment" (State)
8. "Child Labor Laws" (State)
9. "Minimum Wage" (State)
10. "Whistleblowers' Protection Act" (State)
11. "Sexual Harassment Poster" (State)
12. "Workers Compensation" (State)
13. "Maine Employment Security Law" (applicable to employers who must pay unemployment tax).

1. Davis-Bacon and Related Acts

The Contractor must comply with the following contract and subcontract provisions of the Davis-Bacon and Davis-Bacon Related acts. **Attachments to these provisions include: the wage determination for this contract, and applicable forms.**
Note: Sections 1. and 2. have been omitted because they are not applicable to the Contractor.

1. Contract and Subcontract provisions

(a) The State official shall insure that the Owner(s) shall insert in full in any contract in excess of $2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1, the following clauses:

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321, attached) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. Additional copies of this poster can be obtained from the US Department of Labor website.

(ii)(A) Any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The funding agency award official shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the Owner agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), Form 1444 (attached) shall be completed and sent by the Owner to the State official. The State official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the State official or will notify the State official within the 30-day period that additional time is necessary. Additional copies of Form 1444 may be obtained from the US Department of Labor website.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the Owner do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the State official shall refer the questions, including the views of all

interested parties and the recommendation of the State official, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so will advise the State official or will notify the State official within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The Owner shall upon written request of the Funding Agency Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the State Official may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is

enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the Owner. Such documentation shall be available on request of the State Official. As to each payroll copy received, the Owner shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 (attached) is available for this purpose. Additional copies of the form are available from the US Department of Labor Wage and Hour Division Web site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Owner for transmission to the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the Owner.

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 (page 2 of the form is attached) shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractors registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the

Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as may by appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and Owner, State, Funding Agency, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

2. Contract Provision for Contracts in Excess of $100,000.

(a) Contract Work Hours and Safety Standards Act. The Owner shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The Owner**,** upon written request, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the

contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Owner shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Owner shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the State and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

3. Compliance Verification

(a). The Owner shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The Owner must use Standard Form 1445 or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are attached and are available from EPA on request.

(b) The Owner shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, the Owner should conduct interviews with a representative group of covered employees within two weeks of each contractor or subcontractor's submission of its initial weekly payroll data and two weeks prior to the estimated completion date for the contract or subcontract. Owners must conduct more frequent interviews if the initial interviews or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. Owners shall immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence.

(c). The Owner shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The Owner shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the Owner must spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the

contract or subcontract. Owners must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the Owner shall verify evidence of fringe benefit plans and payments there under by contractors and subcontractors who claim credit for fringe benefit contributions.

(d). The Owner shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

(e) Owners must immediately report potential violations of the DB prevailing wage requirements to the the State Official, and to the appropriate DOL Wage and Hour District Office listed at http://www.dol.gov/esa/contacts/whd/america2.htm

General Decision Number: ME130034 03/22/2013 ME34

Superseded General Decision Number: ME20120034

State: Maine

Construction Type: Building

County: Cumberland County in Maine.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/04/2013
1	02/01/2013
2	03/22/2013

BRME0003-001 05/01/2012

	Rates	Fringes
BRICK POINTER/CAULKER/CLEANER	$ 29.49	17.54

CARP0118-015 10/01/2010

	Rates	Fringes
MILLWRIGHT (Industrial and Treatment Plants Only)	$ 23.32	16.80

CARP1996-009 10/01/2010

	Rates	Fringes
CARPENTER (Including Acoustical Ceiling Installation, Drywall Hanging, Form Work, Metal Stud Installation and Industrial Work)	$ 21.26	16.04

* ELEC0567-013 03/01/2013

	Rates	Fringes
ELECTRICIAN	$ 28.83	14.91
Teledata System Installer (Including Installation of Alarms and HVAC Temperature Controls)	$ 22.60	13.83

ELEV0004-004 01/01/2012

	Rates	Fringes
ELEVATOR MECHANIC	$ 50.83	23.535+a+b

a. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day and the Friday after Thanksgiving.

b. VACATION: Employer contributes 8% of basic hourly rate for 5 years or more of service; 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

ENGI0004-023 12/01/2012

	Rates	Fringes
POWER EQUIPMENT OPERATOR: Excavator	$ 30.27	23.64

IRON0007-022 04/02/2012

	Rates	Fringes
IRONWORKER, REINFORCING AND STRUCTURAL	$ 21.62	19.72

LABO0327-007 06/01/2010

	Rates	Fringes
LABORER: Concrete Worker (Pour and Finish Concrete)	$ 16.62	14.35

PLUM0716-005 08/01/2012

	Rates	Fringes
PIPEFITTER (Including Industrial Work and HVAC Pipe Installation)	$ 25.00	14.46

SHEE0017-009 01/01/2010

	Rates	Fringes
SHEET METAL WORKER (HVAC Duct Work Only)	$ 23.38	18.11

SUME2011-029 03/23/2011

	Rates	Fringes
BRICKLAYER	$ 30.35	13.71
DRYWALL FINISHER/TAPER	$ 22.00	0.90
GLAZIER	$ 18.00	3.64
INSULATOR - BATT	$ 16.76	0.00
LABORER: Asphalt Raker	$ 15.66	2.79

LABORER: Demolition	$ 14.85	5.05
LABORER: Common or General, Including brick mason tending and form stripping	$ 13.35	3.80
MECHANICAL INSULATOR, Including Duct and Pipe	$ 18.99	12.56
METAL BUILDING ERECTOR	$ 16.59	3.32
OPERATOR: Asphalt Paver	$ 14.25	1.78
OPERATOR: Backhoe	$ 18.58	2.91
OPERATOR: Crane	$ 22.70	11.14
OPERATOR: Paver (Asphalt, Aggregate, and Concrete)	$ 16.25	6.59
PAINTER: Brush, Roller and Spray	$ 14.73	2.95
PLUMBER, Includes HVAC Unit Installation (Excludes HVAC Pipe Installation)	$ 21.79	2.46
ROOFER, Includes Installation of Metal Roofs	$ 16.76	3.00
SHEET METAL WORKER, Excludes HVAC Duct Installation	$ 19.46	1.75
TRUCK DRIVER: Dump Truck	$ 11.84	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the

Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

ATTACHMENT B

DAVIS BACON FORMS

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section l(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section l(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section l(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at *http://www.dol.gov/esa/whd/forms/wh347instr.htm* or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant ',to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes any statement knowing the same to be false..... shall be fined not more than $5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds $100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in sub paragraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds $100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

U.S. Department of Labor
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

U.S. Wage and Hour Division

Rev. Dec. 2008

OMB No.: 1235-0008
Expires: 01/31/2015

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐	ADDRESS	
PAYROLL NO.	FOR WEEK ENDING	PROJECT AND LOCATION / PROJECT OR CONTRACT NO.

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT. OR ST.	(4) DAY AND DATE — HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS: FICA	WITH-HOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that is will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

INSTRUCTIONS FOR COMPLETING PAYROLL FORM, WH-347

General -The use of WH-347, payroll form, is not mandatory. This form has been made available for the convenience of contractors and subcontractors required by their Federal or Federally aided construction type contracts and subcontracts to submit weekly payrolls. Properly filled out, this form will satisfy the requirements of regulations, Parts 3 and 5 (29 CFR, Subtitle A), as to payrolls submitted in connection with contracts subject to the Davis-Bacon and related Acts.

This form meets needs resulting from the amendment of the Davis-Bacon Act to include fringe benefits provisions. Under this amended law, the contractor is required to pay not less than fringe benefits as predetermined by the Department of Labor, in addition to payment of not less than the predetermined rates. The contractor's obligation to pay fringe benefits may be met either by payment of the fringes to the various plans, funds or programs or by making these payment to the employees as cash in lieu to fringes.

The payroll provides for the contractor's showing on the face of the payroll all monies paid to the employee, whether as basic rates or as cash in lieu of fringes and provides for the contractor's representation in the statement of compliance on the rear of the payroll that he is paying to others fringes required by the contract and not paid as cash in lieu of fringes. Detailed instructions concerning the preparation of the payroll follow;

Contractor or Subcontractor: Fill in your firm's name and check appropriate box.
Address: Fill in your firm's address.

Column 1 – Name, Address and Social Security number of Employee: The employee's full name must be shown on each payroll submitted. The employee's address must also be shown on the payroll covering the first week in which the employee works on the project. The address need not be shown on subsequent weekly payrolls unless his address changes. Although not required by Regulations, Parts 3 and 5, space is available in the name and address section so that Social Security numbers may be listed.

Column 2 – Withholding Exemptions: This column is merely inserted for the employer's convenience and is not a requirement of Regulations, Parts 3 and 5.

Column 3 – Work Classifications: List classifications descriptive or work actually performed by employees. Consult classifications and minimum wage schedule set forth in contract specifications. If additional classifications are deemed necessary see Contracting Officer or Agency representative. Employee may be shown as having worked in more than one classification provided accurate breakdown of hours so worked is maintained and shown on submitted payroll by use of separate line entries.

Column 4 – Hours Worked: On all contracts subject to the Contract Work Hours Standards Act enter as overtime all hours worked in excess of 8 hours per day and 40 hours a week.

Column 5 – Total: Self-explanatory

Column 6 – Rate of Pay, Including Fringe Benefits: In straight time box, list actual hourly rate paid the employee for straight time worked plus any cash in lieu of fringes paid the employee. When recording the straight time hourly rate, any cash in lieu of fringes may be shown separately from the basic rate thus 13.25/. 40. This is of assistance in curectly computing overtime. See ""Fringe Benefits" below. In overtime box show overtime-hourly rate paid, plus any cash in lieu of fringes paid the employee. See "Fringe Benefits" below. Payment of not less than time and one-half the basic or regular rate paid is required for overtime under the Contract Work Hours Standards Act of 1962. In addition to paying not less than the predetermined rate for the classification in which the employee works, the contractor shall pay to approved plans, funds, or programs or shall pay as cash in lieu of fringes amounts predetermined as fringe benefits in the wage decision made part of the contract. See "FRINGE BENEFITS" below.

Fringe Benefits
Contractors who pay all required fringe benefits: A contractor who pays fringe benefits to approved plans, funds, or programs in amount not less than were determined in the applicable wage decision of

the Secretary of Labor, shall continue to show on the face of the payroll the basic cash hourly rate and overtime rate paid to his employees just as he has always done. Such a contractor shall check paragraph 4(a) of the statement on the reverse of the payroll to indicate that he is also paying to approved plans, funds, or programs not less than the amount predetermined as fringe benefits for each craft. Any exceptions shall be noted in Section 4(c)

Contractors who pay no fringe benefits: A contractor who pays no fringe benefits shall pay to the employees, and insert the straight time hourly rate column of the payroll, an amount not less than the predetermined rate for each classification plus the amount of fringe benefits determined for each classification in the applicable wage decision. Inasmuch as it is not necessary to pay time and a half on cash paid in lieu of fringes, the overtime rate shall be not less than the sum of the basic predetermined rate, plus the half time premium on basic or regular rate, plus the required cash in lieu of fringes at the straight time rate. In addition, the contractor shall check paragraph 4(b) of the statement on the reverse of the payroll to indicate that he is paying fringe benefits in cash directly to his employees. Any exceptions shall be noted in Section 4(c).

Use of Section 4(c) Exceptions: Any contractor who is making payment to approved plans, funds, or programs in amount less than the wage determination requires, is obligated to pay the deficiency directly to his employees as cash in lieu of fringes. Any exception to Section 4(a) or 4(b), whichever the contractor may check, shall be entered in Section 4(c). Enter in the Exception column the craft, and enter in the Exception column the hourly amount paid the employee as cash in lieu of fringes and the hourly amount paid to plans, funds, or programs as fringes. The contractor shall pay and shall show that he is paying to each such employee for all hours (unless otherwise provided by applicable determination) worked on Federally assisted project an amount not less than the predetermined rate plus cash in lieu of fringes as shown in Section 4(c). The rate paid and amount of cash paid in lieu of fringe benefits per hour should be entered in column 6 on the payroll. See paragraph on "Contractors who pay no fringe benefits" for computation of overtime rate.

Column 7 – Gross Amount Earned: Enter gross amount earned on this project. If part of the employees' weekly wage was earned on projects other than the project described on this payroll, enter in column 7 first the amount earned on the Federal or Federally assisted project and then the gross amount earned during the week on all projects, thus $63.00/120.00.

Column 8 – Deductions: Five columns are provided for showing deductions made. If more than five deductions should be involved, use first 4 columns; show the balance of deductions under "Other" column; show actual total under "Total Deductions" column; and in the attachment to the payroll describe the deductions contained in the "Other" column. All deductions must be in accordance with the provisions of the Copeland Act Regulations 29 CFR, Part 3. If the employee worked on other jobs in addition to this project show actual deductions from his weekly gross wage, but indicate that deductions are based on his gross wages.

Column 9 – Net Wages Paid for Week: Self-explanatory.

Totals: Space has been left at the bottom of the columns so that totals may be shown if the contractor desires.

Statement Required by Regulations, Parts 3 & 5: While this form need not be notarized, the statement of the back of the payroll is subject to the penalties provided by 18 USC 1001, namely possible imprisonment for 5 years or $10,000.00 fine or both. Accordingly, the party signing this required statement should have knowledge of the facts represented as true.

Space has been provided between items (1) and (2) of the statement for describing any deductions made. If all deductions made are adequately described in the "Deductions" column above, state "See Deductions column in the payroll." See paragraph entitled "FRINGE BENEFITS" above for instructions concerning filling out paragraph 4 of the statement.

Date _____

I, _____ _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Start. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

Abatement Professionals

590 County Road, Suite 2, Westbrook ME 04092 Tel (207) 773-1276 * Fax (207) 772-1203

LIMITED
LEAD-BASED PAINT & ASBESTOS SUEVEY REPORT

FOR THE DWELLING LOCATED AT:

Portland High School
284 Cumberland Avenue
Portland, Maine 04101

PREPARED FOR:

Mr. Aaron Shields
City of Portland
389 Congress Street
Portland, Maine 04103
ads@portlandmaine.gov

BY:

Bruce M. Hackett, Sr.
Certification # R-I-18520-09-00109
Maine Asbestos Inspector # AI-0325

Maine Lead Contractor # LC-0005
Maine Asbestos Consultant # SF-0028

Abatement Professionals

590 County Road, Suite 2, Westbrook ME 04092 Tel (207) 773-1276 * Fax (207) 772-1203

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Abatement Professionals

590 County Road, Suite 2, Westbrook ME 04092 Tel (207) 773-1276 * Fax (207) 772-1203

Date of Evaluation: February 28, 2013

Evaluation Completed By: Bruce M. Hackett, Sr. Signature: Bruce M. Hackett

Organization: Abatement Professionals Corp. Phone: 207-773-1276

Summary Information

1. Identifying Information

A Limited lead-based paint Inspection was conducted at the Portland High School in Portland, Maine on April 1, 2000. The Paint Chip sampling was conducted by Bruce M. Hackett, Sr. Certification # R-I-18520-09-00109. Sampling was conducted in the High School Health Clinic area. (wood shop / Classroom)

2. Summary of Results

Location and Type of Identified Lead-Based Paint and Lead Hazards

While the building and its paint are in reasonably good condition overall, the results showed that **NO** lead-based paint hazards exist all levels were found below the HUD, EPA, and State of Maine levels to be considered lead based paint. All samples were found <0.5% by weight:

However, OSHA governs lead-based paint in **ANY** detectable level. This paint must be address as OSHA compliant please refer to OSHA Title 29 CFR 1926.62 for guidance.

A. Paint Hazards

The following components are deteriorated or will be disturbed during the proposed renovation and contain lead-based paint which must be addressed with interim controls or stabilization:

None were identified

The following components will be disturbed during the proposed renovation and do not contain lead-based paint and/or asbestos :

Floors throughout the proposed area of renovations
All Block and Brick and Plaster/sheetrock Walls throughout the proposed areas of renovations

In addition, an inspection for "suspect" asbestos containing building materials (ACBM) was also conducted while on site, no suspect materials were identified there .

Abatement Professionals

590 County Road, Suite 2, Westbrook ME 04092 Tel (207) 773-1276 * Fax (207) 772-1203

Renovation Recommendations:

The work must be conducted in accordance with OSHA 29 CFR 1926.62. Workers receive a minimum of the OSHA 2-hour lead awareness training.

Should you have any questions and/or concerns feel free to contact me at 773-1276 or direct by cell phone at 615-6908.

Sincerely,

Bruce M. Hackett, Sr.
Industrial Hygienist

590 County Road, Suite 2, Westbrook ME 04092 Tel (207) 773-1276 * Fax (207) 772-1203

PART II
Appendix

SECTION 01 30 00

ALTERATIONS, GENERAL

1. GENERAL

1.01 GENERAL CONDITIONS: The General Conditions, Supplementary General Conditions and all Sections of Division 1 shall apply to each and every contract and contractor, person or persons supplying material, labor or entering into the work directly or indirectly.

1.02 DESCRIPTION:

A. The work covered by all sections of specifications shall conform to the conditions of this Section.

B. The phrase "match existing" shall mean the following: Where Contract Documents call for exact matching, match existing work exactly in quality and appearance. When Contract Documents do not call for exact matching, match existing work as nearly as possible, using normally available materials and workmanship. If normally available materials and workmanship do not approximate existing work notify Architect. If in the Architect's judgment it is impossible to approximate existing work with normally available materials and workmanship, the Architect may issue suitable Change Orders. Changes imposing extra costs to the Contractor will not be ordered without the Contractor's approval. Existing structures and materials are indicated "existing".

C. In general, structures and materials which are not indicated existing are included in the work.

2. PRODUCTS

2.01 GENERAL

A. Materials used to replace, patch or repair existing exposed work shall match or be compatible with existing adjacent finished surfaces.

B. Materials used for such replacement, patching and repairing shall be as specified in the applicable section of this specification and/or as indicated on the drawings, or as approved by the Architect.

3. EXECUTION

3.01 TEMPORARY PARTITIONS Construct necessary temporary dust proof partitions to isolate construction work from adjacent areas and remove partitions when work in area is completed.

3.02 CUTTING AND PATCHING

A. Contractor shall do all demolition, cutting, altering, removing, replacing and patching as necessary for the performance of the contract. Unless otherwise provided by the drawings or specifications, no structural members shall be cut or altered without authorization of the Architect.

B. Where any alteration or new work is indicated it will be required that the contractor perform all necessary cutting, patching, altering and rebuilding necessary to produce a complete, finished and operational element.

C. Work remaining in place which is damaged or defaced by reason of work done under this contract shall be restored equal to its condition at the time of the award of the contract.

D. Where existing work is removed, exposed surfaces shall be finished to match adjacent surfaces.

E. All disturbed plaster areas and all holes, cracks and loose plaster shall be patched to provide a smooth uniform and sound wall, matching existing surfaces. Plaster around ne openings in existing walls shall be cut back to firm bond and patched to match surrounding area. Materials for patching shall be similar to adjacent materials. Bonding agents shall be used as required to produce positive bond.

F. Contractor shall provide all necessary shoring and temporary supports required for proper support of existing and new work during execution of the contract and shall remove same when support is no longer required.

3.03 COOPERATION: The Owner shall have the right, at any time during the construction of the structure, to enter the same for the purpose of installing any necessary work, or for any other purpose in connection with the installation of facilities, it being mutually understood and agreed, however, that the Contractor and the Owner will labor to mutual advantage where their several works in the above mentioned or unforeseen instances touch upon or interfere with each other.

3.04 SALVAGE All materials which are removed will become the property of the Contractor and shall be removed from the premises, unless indicated otherwise on the drawings or in these specifications.

END OF SECTION

SECTION 01 73 10

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:

1. Division 1 Section "Selective Demolition" for demolition of selected portions of the building for alterations.
2. Division 7 Section " Firestopping" for patching fire-rated construction.
3. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

    a. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 15 and 16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.

4. Dates: Indicate when cutting and patching will be performed.
5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-protection systems.
4. Control systems.
5. Communication systems.
6. Conveying systems.
7. Electrical wiring systems.
8. Operating systems of special construction in Division 13 Sections.

C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior curtain-wall construction.
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise- and vibration-control elements and systems.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.

a. Processed concrete finishes.
b. Stonework and stone masonry.
c. Ornamental metal.
d. Matched-veneer woodwork.
e. Preformed metal panels.
f. Roofing.
g. Firestopping.
h. Window wall system.
i. Stucco and ornamental plaster.
j. Terrazzo.
k. Finished wood flooring.
l. Fluid-applied flooring.
m. Aggregate wall coating.
n. Wall covering.
o. HVAC enclosures, cabinets, or covers.

E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

F. Prevent movement or settlement of adjacent elements of construction. Provide and place bracing or shoring and be responsible for safety and support of structure. Be liable for any such movement or settlement and any damage or injury caused.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cease operations and notify the Architect immediately, if safety of structure appears to be endangered. Take all precautions to properly support structure. Do not resume operations until permission is granted by the Architect and authorities having jurisdiction.

END OF SECTION 01731

SECTION 01800 INTERIM LIFE SAFETY MEASURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

B. Contract Documents: Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Existing conditions and restrictions on the use of the Work Area.

2. Requirements for partial Owner occupancy of portions of the work prior to substantial completion of the Contract Work.

1.02 SUMMARY OF LIFE SAFETY MEASURES:

A. The work of this section can be summarized as follows:

1. The purpose of this Section is to develop and implement actions required for hazards posed by Life Safety Code (LSC) deficiencies whenever they occur during construction, alteration, and/or demolition activities.

2. Exits shall be maintained to provide free and unobstructed egress at all times. If alternative exits must be designated, all construction personnel in adjoining areas shall receive training for egress. Such training shall be provided and documented by the Contractor, and conducted in the presence of the Owners's Project Manager.

3. Means of egress in construction areas shall be inspected daily by the Contractor and a daily log of these inspections shall be kept by the Contractor.

4. Emergency departments (fire, rescue, security, etc.) shall be provided with free and unobstructed access for emergency services.

5. All fire alarm, detection, and suppression systems shall not be impaired without prior approval by the Owner's Project Manager. Temporary systems shall be provided by the Contractor if a fire system is impaired for more than twenty-four (24) hours. Any temporary systems shall be inspected and tested monthly by the Contractor; all inspections and tests shall be fully documented. Temporary systems shall be approved by the Owner's Project Manager.

6. All temporary construction partitions that compromise a fire or smoke barrier shall be maintained smoke-tight and constructed of non-combustible or limited-combustible materials that will not contribute to the development or spread of a fire. All seams and joints shall be taped.

7. The Contractor shall provide additional fire-fighting equipment and use training for construction personnel.

8. Smoking shall be prohibited within the facility and on construction sites except in designated external smoking areas.

9. The Contractor shall develop and enforce housekeeping, storage, and debris-removal policies that reduce the flammable and combustible fire load of the building to the lowest level necessary for daily operations.

10. The Contractor shall train construction personnel in alternative fire safety procedures when structural or compartmentation features of fire safety are compromised. The Owner shall train hospital staff in these same procedures. The Owner shall also instruct the Contractor as to normal fire response procedures. All training shall be documented.

11. The Owner shall conduct organization-wide safety education programs to ensure awareness of any Life Safety Code deficiencies, construction hazards, and Interim Life Safety Measures.

13. Construction areas shall be maintained in a secure condition at all times. Doors to temporary partitions shall remain locked at all times.

14. The Owner shall increase hazard surveillance of construction areas as necessary and shall document such surveillance on field report forms.

B. Documentation of all inspection, testing, training, monitoring, surveillance, and evaluation of Interim Life Safety Measures shall be provided by the Contractor and/or the Owner according to their separate responsibilities as defined in this Section.

1.03 MISCELLANEOUS PROVISIONS:

A. Temporary Fire Protection

1. Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the type needed to protect against reasonable, predictable, and controllable fire losses. Comply with NFPA 10 "Standard For Portable Fire Extinguishers", and NFPA 241 "Standard For Safeguarding Construction Alterations and Demolition Operations".

2. Provide hand-carried portable, UL-rated, Class "A" fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class "ABC" dry chemical extinguishers of NFPA recommended classes for exposures.

3. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stair.

4. Store combustible materials in metal containers in fire-safe locations.

5. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairs, and other access routes for fighting fires.

6. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition. Comply with MMC open flame procedure.

7. Collect waste from construction areas daily. Comply with requirements of removal of combustible waste material and debris, enforcing requirements strictly. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of all waste materials in a lawful manner.

B. Observation: Regular observation of the construction site will be done by the Owner's Project Manager.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 01800

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Demolition and removal of selected portions of building or structure.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1. Coordinate with Owner's historical adviser, who will establish special procedures for removal and salvage.

1.5 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

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

D. Standards: Comply with ANSI A10.6 and NFPA 241.

E. Predemolition Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to selective demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.6 PROJECT CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.7 WARRANTY

A. Existing Warranties: 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 Used)

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 intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

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

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

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

a. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

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

3.4 SELECTIVE DEMOLITION, GENERAL

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

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
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. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. 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 fire watch and 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 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. Comply with requirements in Division 01 Section "Construction Waste Management and Disposal."

B. Reuse of Building Elements: Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site designated by Owner.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Cut concrete to a depth of at least 3/4 inch at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI-WP and its Addendum.

1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.

F. Air-Conditioning Equipment: Remove equipment without releasing refrigerants.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

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

3.7 CLEANING

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

END OF SECTION 02 41 19

SECTION 06 40 23

INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. High pressure decorative laminate base cabinets.
   2. High pressure decorative laminate adjustable shelving.
   3. High pressure decorative laminate counters.

B. Related Sections include the following:
   1. Division 06 Section "Rough Carpentry".

1.2 SUBMITTALS

A. Product Data: For medium-density fiberboard, particleboard, plywood, high-pressure decorative laminate, adhesive for bonding plastic laminate, thermoset decorative overlay, cabinet hardware and accessories.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
   1. Show details full size.
   2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
   3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in architectural woodwork.
   4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

C. Samples for Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of material indicated.
   1. High pressure laminate.
   2. Exposed cabinet hardware and accessories, one unit for each type and finish.

D. Product Certificates: Signed by manufacturers of woodwork certifying that products furnished comply with requirements.

1.3 QUALITY ASSURANCE

A. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork, construction, finishes, and other requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Products: Comply with the following:
   1. Hardboard: AHA A135.4.
   2. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
   3. Particleboard: ANSI A208.1, Grade M-2.
   4. Softwood Plywood: DOC PS 1.
   5. Hardwood Plywood and Face Veneers: HPVA HP-1.

2.2 FABRICATION, GENERAL

A. Interior Woodwork Grade: Provide Custom grade interior woodwork complying with the referenced quality standard.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.5 mm).
   2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
   3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch (1.5 mm).

D. Complete fabrication, including assembly, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

E. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
   1. Seal edges of openings in countertops with a coat of varnish.

2.3 INTERIOR ARCHITECTURAL WOODWORK

A. Plastic Laminate Countertops:
   1. Grade: Premium, for all countertops.
   2. Plastic Laminate Type: 0.050 in. thick; UL tested and labeled ratings of 25 for flame spread, 25 for fuel contributed and 100 for smoke developed when bonded to wood particle board.
   3. Edging and Backsplashes: Self edged (plastic laminate) unless otherwise indicated, same material as face.
   4. Core Material: Moisture resistant particleboard.
   5. Sealant: Type as manufactured or recommended in writing by manufacturer of plastic laminate, color to match plastic laminate.
      a. Silicone Sealant: Mildew resistant type, formulated for pointing of tile, color to match the plastic laminate where feasible; or clear as directed by Architect.

B. Plastic Laminate Casework:
   1. Grade: Custom.
   2. Construction: Flush overlay.
   3. Core Material: Particleboard.
   4. Base Construction: Provide separate full ladder design subbase of Exterior Grade Plywood, high PVC molding channel around bottom of base, or snap in base with Exterior Grade Plywood and adjustable leveling legs, to protect against spilled or standing water on floor.
   5. Hang Rails and Stiffeners: Provide 3/4" x 3" hardwood handrail top and bottom for wall cabinets, top of cabinet for base cabinets, sufficient stiffeners to support cabinets without backing material.
      a. Designs depending on cabinet backing for support will not be acceptable.
   6. Back of Cabinets: 1/2" minimum particleboard.
   7. Exposed Portions:
      a. Door and drawer fronts, end panels, divider panels at open cabinets and similar locations: High pressure plastic laminate on particleboard.
      b. Exposed edges: Self edged 0.020" color matched PVC.
      c. Adjustable Shelving: Edge banding at both edges to allow for reversing; and at ends where exposed to view in the finished work.
      d. Door and drawer edges: 3mm PVC edging, to match HPDL.
   8. Semi Exposed Surfaces, (Concealed when doors are closed): One of following at option of Installer:
      a. White melamine.
      b. Transparent finish, on plywood (birch acceptable).
      c. Prefinished particleboard, edge banded.

C. Fixed Utility and Adjustable Shelving (non part of casework): Particleboard with HPDL & 3mm edges.
   1. Thickness: 3/4"
   2. For adjustable shelving provide edge banding both edges to allow for reversing, and one on ends where exposed to view in the finished work.

2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.

B. Hardware Standard: Comply with BHMA A156.9 for items indicated by referencing BHMA numbers or items referenced to this standard.

C. Cabinet Hardware Schedule:
   1. Shelf Supports, Plug-In Type: Hafele No. 282.11.761, nickel-plated, or equal.
   2. Vertical Slotted Shelf Standards and Brackets: Spur.
   3. Drawer Slides: Knape & Vogt # 8400
   4. Door Hinges: Blum CLIP-TOP 170º Concealed Hinges, Self-Closing
   5. Door and Drawer Pulls: Ives #38 B26D.
   6. Drawer Rim Locks: Hafele No. 232.04.6xx, nickel-plated, or equal.
   7. Door Rim Locks: Hafele No. 235.06.6xx, nickel-plated, or equal.
   8. Metal Counter Brackets: A+M Hardware, 1/8" powder coated steel, 15" x 21".
   9. Desk Grommets: 2" ø black ABS.

D. Exposed Hardware Finish: Except where not available, provide exposed hardware with BHMA Code 626 satin chromium plate finish (US26D); where not available, provide either satin aluminum or satin stainless steel finish.

2.5 INSTALLATION MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

3.1 PREPARATION

A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.

B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.

D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

E. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches (900 mm) long, except where shorter single-length pieces are necessary.
   1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base, if finished.
   2. Install wall railings on indicated metal brackets securely fastened to wall framing.
   3. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).

F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
   1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
   2. Maintain veneer sequence matching of cabinets with transparent finish.
   3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for 1-inch (25-mm) penetration into wood framing, blocking, or hanging strips.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06 40 23

SECTION 07 84 00

FIRESTOPPING

PART 1 - GENERAL

1.1 GENERAL CONDITIONS The General Conditions, Supplementary General Conditions and all Sections of Division 1 shall apply to each and every contract and contractor, person or persons supplying material, labor or entering into the work directly or indirectly.

1.2 SCOPE Installation of firestopping materials at openings and voids in, or at periphery of fire-rated construction.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 07 92 00 - Joint Sealers

B. Division 23 - Mechanical

C. Division 26 - Electrical

1.4 REFERENCES

A. ASTM E-814: Fire Tests of Through Penetration Firestops.

B. UL 1479: Fire Tests of Through Penetration Firestops.

C. UL Building Materials Directory: "Through Penetration Firestop Systems (XHEZ), and Fill, Void or Cavity Materials (XHHW).

D. International Building Code (IBC).

E. NFPA 101 Life Safety Code.

F. NFPA 70: National Electrical Code.

1.5 DEFINITIONS

A. Firestopping: A material, or combination of materials, to retain the integrity of time rated construction by maintaining an effective barrier against the spread of flame, smoke and gases. It shall be used in specific locations as follows:
   1. Duct, cable, conduit and piping penetrations through floor slab and through time rated partitions or fire walls.
   2. Openings between floor slabs and curtain walls, including inside hollow curtain walls at the floor slab.
   3. Penetrations of vertical service shafts.
   4. Openings and penetrations in time rated partitions or fire walls containing fire doors.
   5. Locations where specifically shown on the Drawings or where specified in other Sections of the Project Manual.

1.6 QUALITY ASSURANCE

A. Submit manufacturer's product data, letter of certification, or certified laboratory test report that the material or combination of materials meet the requirements specified in ASTM E-814 and are so classified in UL's Building Materials Directory.

B. Materials shall meet and be acceptable for use by all three model building codes, Basic/National Building Code, Uniform Building Code, Standard Building Code Per NER-243.

C. Materials shall meet the requirements of NFPA 101 - Life Safety Code and NFPA 70 - National Electrical Code.

1.7 SUBMITTALS

A. Submit shop drawings, product data, certificates and manufacturer's installation instructions.

B. Submit manufacturer's product data for all materials and prefabricated devices, providing descriptions sufficient for identification at the job site. Include manufacturer's instructions for installation.

C. Submit shop drawings showing proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details shall reflect actual job conditions.

1.8 SEQUENCE/SCHEDULING: Coordinate the work of this Section with work performed under other Sections of the Project Manual.

PART 2 - PRODUCTS

2.1 FIRESTOPPING MATERIALS

A. Firestop Caulking
   1. Materials shall be the following types of products:
      a. Caulking and putty
      b. Intumescent wrap strips and sheets
      c. Restricting collars
   2. Acceptable Manufacturer: 3M Fire Protection Products, St. Paul, MN 55144

B. Mineral Fiber Safing
   1. Materials shall be the following products:
      a. Thermafiber Safing Insulation by USG, unfaced, 4" thick.
      b. Firecode Compound by USG.

C. Firestopping material shall be asbestos free and capable of maintaining an effective barrier against flame, smoke and gases in compliance with the requirements of ASTM E-814 and UL 1479.

D. Materials shall be suitable for the firestopping of penetrations made by steel, glass, plastic and insulated pipe.

E. On insulated pipe, the fire rating classification must not require removal of the insulation.

F. The rating of the firestops shall be no less than the rating of the time rated floor or wall assembly.

PART 3 - EXECUTION

3.1 PREPARATION: Clean surfaces to receive firestopping materials. Remove dirt, grease, oil, loose materials, rust or other substances that may affect installation or the fire resistance.

3.2 INSTALLATION

A Install firestopping materials as indicated in accordance with manufacturer's instructions.

B. Seal all holes or voids made by penetrations to ensure an effective fire barrier.

C. Install firestopping materials so that void openings 4” or larger will support the required floor load, unless the opening is protected from possible loading or traffic.

3.3 FIELD QUALITY CONTROL

A. Examine firestopped areas to ensure proper installation prior to concealing or enclosing firestopped areas.

B. Areas of work shall remain accessible until inspection and approval by the applicable code authorities.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard hollow metal doors and frames.
2. Embossed hollow metal doors.
3. Hollow metal windows.

B. Related Sections:

1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
2. Division 08 Section "Door Hardware" for door hardware for hollow metal doors.
3. Division 09 Section "Interior Painting" for field painting hollow metal doors and frames.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.4 SUBMITTALS

A. General: Submittals for Sections 081113, 081416 and 087100 shall be made concurrently.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, and finishes.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.

6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.

D. Other Action Submittals:

1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

C. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9. Label each individual glazed lite.

D. Smoke-Control Door Assemblies: Comply with NFPA 105 or UL 1784.

E. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

1. Doors: Provide doors as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:

a. Clear Width: 32 inches (815 mm) with door 90 degrees open.
b. Maneuvering Clearances: Refer to Code for various side and approach clearances.
c. Double-Leaf Doorways: Provide at least one leaf that meets the clear width and maneuvering clearances.
d. Two Doors in Series: Provide a distance of four feet plus the width of any door swinging into the space between hinged or pivoted doors.

2. Notify Architect of details or specifications not conforming to code.

F. Preinstallation Conference: Conduct conference at Project site.

1. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
2. Review tie-in to air barrier system.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to finish of factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Standard Steel Doors and Frames:

a. Ceco Door Products; a United Dominion Company.
b. Curries Company.
c. de La Fontaine, Industries.
d. Steelcraft; a division of Ingersoll-Rand.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.

1. Wipe Coat Galvanneal materials will not be considered acceptable.

D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.

H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

I. Glazing: Comply with requirements in Division 08 Section "Glazing."

J. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 STANDARD HOLLOW METAL DOORS

A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.

a. Fire Door Core: As required to provide fire-protection ratings indicated.
b. Thermal-Rated (Insulated) Doors: Where indicated, provide doors fabricated with thermal-resistance value (R-value) of not less than 10.0 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.

1) Locations: Exterior doors and interior doors where indicated.

3. Vertical Edges for Single-Acting Doors: Beveled edge.

   a. Beveled Edge: 1/8 inch in 2 inches.

4. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- thick, end closures or channels of same material as face sheets.
5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Level 2 (18 ga faces) and Physical Performance Level B (Heavy Duty), Model 2 (Seamless).

C. Interior Doors: Face sheets fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Level 2 (18 ga faces) and Physical Performance Level B (Heavy Duty), Model 2 (Seamless).
2. Face Design: Flush or embossed as shown.

D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

E. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.4 STANDARD HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Exterior Frames: Fabricated from metallic-coated steel sheet.

1. Fabricate frames with mitered or coped corners.
2. Fabricate frames as face welded unless otherwise indicated.
3. Frames for Level 2 Steel Doors: 0.053-inch- thick steel sheet.

C. Interior Frames: Fabricated from cold-rolled steel sheet, unless metallic-coated sheet is indicated.

1. Fabricate frames with mitered or coped corners.
2. Fabricate frames as knocked down unless otherwise indicated.
3. Frames for Level 2 Steel Doors: 0.053-inch- thick steel sheet.
4. Frames for Wood Doors: 0.053-inch- thick steel sheet.
5. Frames for Borrowed Lights: 0.053-inch- thick steel sheet.

D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.6 STOPS AND MOLDINGS

A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.

B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch high unless otherwise indicated.

C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, fabricated from same material as frames in which they are installed.

2.7 LOUVERS

A. Provide louvers for interior doors, where indicated, that comply with SDI 111C, with blades or baffles formed of 0.020-inch- thick, cold-rolled steel sheet set into 0.032-inch- thick steel frame.

1. Sightproof Louver: Stationary louvers constructed with inverted V-shaped or Y-shaped blades.
2. Lightproof Louver: Stationary louvers constructed with baffles to prevent light from passing from one side to the other, any angle.
3. Fire-Rated Automatic Louvers: Louvers constructed with movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same testing and inspecting agency that established fire-resistance rating of door assembly.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Ceiling Struts: Minimum 1/4-inch-thick by 1-inch- wide steel.

C. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

2.9 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

C. Hollow Metal Doors:

1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
2. Glazed Lites: Factory cut openings in doors.
3. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Full hinge cut-outs for non-handed doors will not be acceptable.

D. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
2. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
4. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
6. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        1) Two anchors per jamb up to 60 inches high.
        2) Three anchors per jamb from 60 to 90 inches high.
        3) Four anchors per jamb from 90 to 120 inches high.
        4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

1) Three anchors per jamb up to 60 inches high.
2) Four anchors per jamb from 60 to 90 inches high.
3) Five anchors per jamb from 90 to 96 inches high.
4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
5) Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.

c. Compression Type: Not allowed.
d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

7. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.

a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

F. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

G. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow metal work.
5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.10 STEEL FINISHES

A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:

1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

D. At exterior walls and masonry walls, coat inside of frame profile with bituminous coating to a thickness of 1/16 inch.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-protection-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable glazing stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

    a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
5. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
8. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.

c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors according to NFPA 105.

D. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 08 11 13

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Sections:
1. Division 08 Section "Glazing" for glass view panels in flush wood doors.
2. Division 08 Section “Door Hardware” for hardware installed in wood doors.
3. Division 08 Section “Hollow Metal Doors and Frames for door frames.
4. Division 09 Section “Interior Painting” for field finishing of wood doors.

1.3 SUBMITTALS

A. General: Submittals for Sections 08 11 13, 08 14 16 and 08 71 00 shall be made concurrently.

B. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, and trim for openings. Include factory-finishing specifications.

C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.
4. Indicate doors to be factory finished and finish requirements.
5. Indicate fire-protection ratings for fire-rated doors.

D. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain flush wood doors from single manufacturer.

B. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positve pressure according to NFPA 252 and UL 10C.

1. Include all requirements as part of the door construction per Category “A” guidelines.”

D. Preinstallation Conference: Conduct conference at Project site.

1. Inspect and discuss condition of substrate and other preparatory work performed by other trades.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

2. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Flush Wood Doors:

a. Algoma Hardwoods Inc.
b. Eggers Industries; Architectural Door Division.
c. Marshfield Door Systems, Inc.: Signature Series.
d. Mohawk Flush Doors, Inc.
e. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.

B. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.

C. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-2.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

D. Structural-Composite-Lumber-Core Doors:

1. Structural Composite Lumber: WDMA I.S.10.

a. Screw Withdrawal, Face: 700 lbf.
b. Screw Withdrawal, Edge: 400 lbf.

2. Provide doors with structural-composite-lumber cores instead of particleboard cores for the following doors:

a. Doors indicated to receive exit devices.
b. Doors where oversized glass lites exceed more than 40 percent of the door surface area.
c. Doors where louvers exceed more than 40 percent of the door surface area.

E. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.

1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

F. Mineral-Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Premium, with Grade A faces.
2. Species: Select white birch.
3. Cut: Rotary cut.
4. Match between Veneer Leaves: Book match.
5. Assembly of Veneer Leaves on Door Faces: Running match.
6. Pair and Set Match: Provide for doors hung in same opening.
7. Exposed Vertical Edges: Same species as faces.
8. Core: Particleboard except where structural composite lumber is required.
9. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering.
10. Adhesives: Type I per WDMA TM-6.

2.4 LIGHT FRAMES

A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads as follows unless otherwise indicated.

1. Wood Species: Same species as door faces.
2. Profile: Flush, square shape.
3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.

B. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; with baked-enamel- or powder-coated finish; and approved for use in doors of fire-protection rating indicated.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with requirements in NFPA 80 for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

C. Openings: Cut and trim openings through doors in factory.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Louvers: Factory install louvers in prepared openings.

D. Factory Glazing: Provide glazing for all doors. Provide glass as specified in Division 08 Section “Glazing.” Install fire-rated glass as required by the glazing manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames before hanging doors.

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Division 08 Section "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16

SECTION 08 71 00

DOOR HARDWARE

PART 1 – GENERAL

2.1 SUMMARY

A. This Section includes all labor, materials, equipment and related services necessary for the fabrication, delivery and installation of the work shown on the drawings and/or specified herein, including but not limited to the following:

1. Finish hardware for swinging doors

2.2 RELATED DOCUMENTS

A. Division 1: Administrative, procedural, and temporary work requirements

B. Specification Technical Sections:

1. Section 08 11 13 – Hollow Metal Doors and Frames
2. Section 08 14 16 – Flush Wood Doors

2.3 QUALITY ASSURANCE:

A. The hardware supplier shall have in his employ an architectural hardware consultant (AHC) or a person with equivalent number of years required for AHC qualifications. This person shall be recognized as having the ability to be fully responsible for the scheduling, detailing and execution of this section of the specifications and related items. This qualified consultant shall be responsible for processing all submissions, correspondence, technical matters related to the finish hardware and it's application specified in this section.

B. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

1. Door Hardware: Provide hardware as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:

   a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
   b. Door Closers: Comply with the following maximum opening-force requirements indicated:
      1) Interior Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
      2) Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
      3) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

   c. Thresholds: Not more than 1/2 inch (13 mm) high. Bevel raised thresholds with a slope of not more than 1:2.

2. NFPA 101: Comply with the following for means of egress doors:

a. Latches, Locks, and Exit Devices: Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.

b. Delayed-Egress Locks: Lock releases within 15 seconds after applying a force not more than 15 lbf (67 N) for not more than 3 seconds.

c. Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.

d. Thresholds: Not more than 1/2 inch (13 mm) high.

2.4 REFERENCES:

A. ANSI A115 Standards for door and frame preparation

B. ANSI A156 Standards for finish hardware

C. NFPA 80

D. Other applicable life safety or building codes.

2.5 SUBMITTALS:

A. The hardware supplier shall, if requested, submit for approval one sample of each of the hardware items listed prior to receiving approval of the finish hardware schedule. The approved samples shall be available for installation as part of the project, if the supplier determines it to be in his best interest to do so.

B. The submission list accompanying samples shall include the following information:

Item	Catalog No.	Manufacturer
Lockset	6666	Lock Company

C. The hardware supplier shall, if requested, submit for approval one sample of each of the hardware items listed prior to receiving approval of the finish hardware schedule. The approved samples shall be available for installation as part of the project.

D. Samples required for use as physical templates by other trades shall be purchased and paid for by the respective trade requiring them.

E. The finish hardware supplier shall submit for approval a complete and detailed finish hardware schedule using a vertical typewritten format. The finish hardware schedule shall contain a listing of the name of each manufacturer and the product listing for the series included in the hardware schedule.

F. It shall be the responsibility of the finish hardware supplier to meet with the owner or the

owner's representative, and provide a detailed keying schedule listing the respective key symbol and location for the locksets having the corresponding key symbol.

G. Provide five (5) regular copies of the finish hardware schedule for approval.

H. The finish hardware supplier shall make available to the general contractor a detailed list of template numbers and templates required for each of the door manufacturers that require templates.

2.6 DELIVERY, STORAGE AND HANDLING:

A. The finish hardware shall be delivered to the jobsite and received there by the general contractor. The general contractor shall prepare a locked storage room with adequate shelving, for all hardware. The storage room shall be in a dry, secure area, and shall not include storage of other products by other trades.

B. All finish hardware shall have the necessary screws, bolts and other fastenings required for correct installation of each item. The cylinders, locksets, exit devices and door closers shall be clearly marked with the respective individual door or heading number.

C. After the hardware has been installed and prior to the acceptance of the building by the owner, it shall be the general contractors responsibility to properly protect the hardware and the hardware finish from all dents, scratches, defacing that may occur during the construction period. Hardware that is considered damaged or scratched during the construction period shall be replaced by the general contractor at no cost to the owner or hardware supplier. Hardware items with paint on them shall be cleaned and/or replaced by the general contractor at no charge to the owner or hardware supplier.

2.7 WARRANTY:

A. The finish hardware specified for this project shall be guaranteed against defects in material and workmanship for a period of (1) year from date of completion and acceptance of this building. In addition, door closers shall carry a guarantee of ten (10) years from date of completion and acceptance of this building.

B. If an item of hardware is found to be defective by reasons of defects in material and workmanship, it shall be replaced by the hardware supplier at no charge to the owner. The installation of the replacement item shall be the responsibility of the general contractor if within the building guarantee period specified under general conditions, or by the owner if beyond the building guarantee period.

2.8 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

PART 2 – PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section and the Door Hardware Schedule at the end of Part 3.
   1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:

   1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

   2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.2 HINGES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Hinges:
      a. Hager Companies (HAG).
      b. McKinney Products Company; Div. of ESSEX Industries, Inc. (MCK).
      c. PBB, Inc. (PBB).
      d. Stanley Commercial Hardware; Div. of The Stanley Works (STH).
   2. Continuous Geared Hinges:
      a. Hager Companies (HAG).
      b. McKinney Products Company; Div. of ESSEX Industries, Inc. (MCK).
      c. Pemko Manufacturing Co., Inc. (PEM).
      d. Zero International, Inc. (ZRO).

B. Quantity: Provide the following, unless otherwise indicated:
   1. Two Hinges: For doors with heights up to 60 inches (1524 mm).
   2. Three Hinges: For doors with heights 61 to 90 inches (1549 to 2286 mm).
   3. Four Hinges: For doors with heights 91 to 120 inches (2311 to 3048 mm).
   4. For doors with heights more than 120 inches (3048 mm), provide 4 hinges, plus 1 hinge for every 30 inches (750 mm) of door height greater than 120 inches (3048 mm).

C. The following is a guide for hinge size and type required for this project.

	Manufacturer	Interior:
1-3/4” Doors	Stanley	FBB179-4 1/2"
up to 3’-0” wide	Hager	BB1279-4 1/2"

	McKinney	TA-TB2714-4 1/2"
	PPB	BB81
1-3/4" Doors	Stanley	FBB168-4 1/2"
over 3'-0" wide	Hager	BB1168-4 1/2"
	McKinney	T4A-T4B3786-4 1/2"
	PPB	4B81

D. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

E. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
   1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
      a. Outswinging exterior doors.
      b. Outswinging corridor doors with locks.
   2. Corners: Square.

F. Continuous-Geared Hinges: Provide concealed, heavy-duty, extruded aluminum, continuous geared type. Each hinge shall have special nylon bearings spaces 2-9/16" on center with counter sunk screw holes located between bearings also on 2-9/16" center. Each hinge shall have a continuous extruded cap with self jigging flanged leafs intermeshing the full length of the door. Hinge length shall be 1" less than door height.
   1. Product: Roton 780 Series Heavy Duty Concealed Leaf Hinge manufactured by Hager Companies

G. Fasteners: Comply with the following:
   1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
   2. Wood Screws: For wood doors and frames.
   3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
   4. Screws: Phillips flat-head screws; machine screws (drilled and tapped holes) for metal doors, wood screws for wood doors and frames. Finish screw heads to match surface of hinges.

2.3 MORTISED LOCKS & LATCHES

1. Locksets for this project shall be mortise type with solid cast stainless steel lever handle with sectional trim.
2. Latchbolts shall be two piece mechanical anti-friction ANSI Standard 156.13 1000.
3. Strikes shall be curved lip stainless steel ANSI Standard A115.1, 4 7/8" x 1 1/4".
4. Locks and cylinders shall be manufactured and supplied by the same manufacturer. All locksets and cylinders for this project shall be manufactured in the United States of America by a recognized and reputable lock manufacturer.
5. Locksets for labeled fire doors shall have a fusible link or other mechanism to prevent latchbolt retraction in the event of fire.
6. Provide knurling or tactile warning on trim at doors indicated.
7. The following is a guide to the manufacturers and designs acceptable for this project.

Sargent 8100 Series LNL Design

8. The following is a list of lock functions as indicated under "hardware sets":

	FUNCTION	Sargent
A	Storeroom	57
B	Entrance	51
C	Passage	10
D	Classroom	55
E	Vestibule	72
F	Privacy	20

2.4 HEAVY DUTY CYLINDRICAL LOCKSETS

1. Where indicated by the lock function listings below, locksets shall be heavy duty bored or cylindrical type.
2. The following is a list of manufacturers and designs acceptable for this project:

   Sargent 10 Line LL Design

3. Strikes for metal frames shall conform to ANSI standard A115.2 and shall be 4-7/8” x 1-1/4” with curved lip.
4. All locksets for this project, shall be by the same manufacturer and shall be manufactured in the USA by a reputable builders hardware manufacturer.
5. The following is a list of lock functions as indicated under “hardware sets”:

	FUNCTION	Sargent
1	Storeroom	04
2	Entrance	05
3	Passage	15
4	Classroom	37
5	Vestibule	16
6	Privacy	65

2.5 MORTISE DEADLOCKS

1. Where mortise deadlock functions are listed in the hardware set numbers, provide 2 3/4" backset mortise deadlock having a heavy gauge wrought steel case. The case size shall be no less than 3 3/4" x 2 3/4" x 1" with a bronze adjustable lock front 1 1/8" x 4 5/8" (bevel adjustment 1/8" in 2").
2. The deadbolt shall be 1" throw cast or extruded bronze.
3. The following manufacturers and model numbers will be acceptable:
   Sargent 4800 Series

4. The following functions shall be required where specified:

FUNCTION	SARGENT
I	4

II	5
III	6
IV	7

2.6 EXIT DEVICES:

1. Exit devices for this project shall be the product of one manufacturer and shall be of scheduled type.
2. All exit hardware regardless of type and function shall be made of non-ferrous parts of stainless steel or bronze. Exit devices with internal parts of steel, aluminum or die cast metal other than bronze or stainless steel will not be acceptable.
3. The touch pad shall retract the latchbolt by means of a sliding motion of the touch pad towards the lock stile, activating the lever arm for easy operation and reduced friction.
4. Provide locking function for all exit devices.
5. All exit devices, regardless of function, except for fire rated devices, shall have one point cylinder dogging. The cylinder for cylinder dogging shall be a six (6) pin cylinder keyed to the building masterkey system as specified under Section, "Keying."
6. Trim for exit devices shall be one of the following as specified:
   (a) Pull handles as specified in Section Push and Pull Bars.
   (b) Solid brass lever handle with cast escutcheon for all fire rated doors.
7. Devices for fire rated doors shall be listed by Underwriters Laboratories for 3 hour A label doors. Exit devices with ratings of less than 3 hours or listed with Laboratories other than Underwriters Laboratories shall not be considered acceptable for this project. All fire exit devices required to be installed on fire rated doors shall carry a supplementary label bearing the marking: "Fire Doors To Be Equipped With Fire Exit Hardware".
8. Where removable mullions are required for pairs of doors, provide a fire rated U.L. listed channel iron mullion. Fire rated U.L. listed mullions shall be provided for all pairs of doors requiring mullions whether the door carries a fire rating or not.
9. Provide exit models by one of the following manufacturers:

   Sargent 80 Series

2.7 KEYING:

1. All locks and cylinders shall be as required by Owner’s instructions and shall be operated by masterkey group AA and grand masterkey group A. Provide 6 pin tumbler key removable and interchangeable core cylinders for this project.
2. It is required that the key systems have visual key control and that all keys and cylinders be stamped with the alphanumeric key symbol designated for each key change as recommended by the Nomenclature for Masterkey Systems established by the Door and Hardware Institute.
3. Provide each key removable core cylinder with a construction masterkey core of brass or plastic. The construction cores shall be used by the General Contractor throughout the construction period. One (1) week prior to acceptance of the building, or at the owners request, the successful hardware contractor shall visit the building and by use of a special control key, shall remove the brass or plastic construction cores from all cylinders and replace them with the permanent cores required with each cylinder.

4. Provide a total of six grand masterkeys, six masterkeys and two (2) special control key for removing the key removable core cylinder. Provide a total of six (6) construction masterkeys for the temporary cores.
5. Provide a minimum of four (4) keys for each keyed different change.
6. Provide a total of ten (10) spare cores to be turned over to the owners for their use.

2.8 KEY CABINET:

1. Furnish a wall mounted key cabinet in grey neutratone finish with a capacity capable of containing all the keyed different and alike changes required for this project and an additional 20% greater quantity for future expansion.
2. Provide a complete cross-indexing system, including: 1.Hook number, 2.Key number, 3. Description of item to which key belongs.
3. It shall be the responsibility of the hardware supplier to receive the keys from the lock manufacturer. He shall then prepare a complete type-written cross-file index system as prescribed in the manufacturers key index manual. It shall also be the hardware supplier's responsibility to attach the keys to the fibre tags and to install on corresponding numbered hook in the key cabinet.
4. It shall be the general contractor's responsibility to install the key cabinet where directed by the Owner.
5. Key control systems of the following manufacturers will be acceptable for this project:
   Telkee, Inc.
   Key Control Systems, Inc.

2.9 DOOR CLOSERS:

1. All door closers for this project shall be the product of one manufacturer and shall have either a die cast aluminum or a cast iron case. The die cast aluminum shall be a special R14 aluminum alloy and shall contain a minimum of 14% silica for hardness to resist wear and minimize porosity of the aluminum case. Provide technical documentation regardless of which closer is proposed in order to verify that the door closer case is a minimum R14 aluminum alloy containing 14% silica for minimum porosity and wear, and designed for high tensile strength, without brittleness.
2. Door closers shall be full rack and pinion type construction, non handed and sized from 1 thru 6 in accordance with ANSI A117.1 handicap code.
3. All closers shall have separate adjustable, non critical key control valves, one each for the following:
   (a) closing speed
   (b) latching speed
   (c) back check positioning valve and/or delayed action
4. Hydraulic fluid shall be of a type requiring no seasonal adjustment for varying temperatures.
5. The pinion shall be heavy duty double heat treated steel construction with a minimum 11/16" diameter.

6. The cylinder bore shall be no less than 1 1/2" diameter to provide maximum oil displacement,

   and to permit non-critical control of all valves.
7. The following door closer products shall be considered acceptable for this project:
   Sargent - 281 (handicap sized)

8. The hardware contractor shall insert in the hardware schedule, beside each door listing, the required degree of opening for each door. If the door swing is over 140 degrees, parallel arm type closers shall be used. Door closers mounted on corner brackets, or top jamb application, shall not be permitted. Where indicated in the hardware set numbers, provide a parallel track arm mounted on the hinge side of the door frame head.

9. Provide hold open arms, where specified, in accordance with the hardware set numbers.
10. Door closers with cush-n-stop arms shall be provided for all exterior, out-swing doors and other openings as specified under hardware sets. They shall have heavy forged steel parallel arms and soffit plates attached to the frame by six (6) screws. The forged steel soffit plate shall have a positive stop bracket with an adjustable tension hold-open feature controlled with a slotted screw or control knob, permitting adjustment from hold-open to no hold-open and full restraint of door movement.
11. Where door closers are noted to require delayed action feature, provide closers as specified herein, but having a separate delayed action valve, to permit adjustment of delayed action cycle. When adjusted, the door closer shall close at a controlled rate of speed, through the delayed action cycle range.
12. The installing contractor shall be responsible for proper installation of door closers in accordance with degree of opening indicated on hardware schedule. The installing contractor shall be responsible for adjustment of the three individual valves, for proper control as follows:
    1- closing speed,
    2- latching speed,
    3- delayed action, or backcheck.

    The installing contractor shall be responsible for providing the correct spring power adjustment, from size 1 thru 6, as individually required for each door leaf and as set forth in Part III Execution.

13. Where top rail of door is insufficient in height to mount the closer directly to the rail, drop bracket plates shall be provided.
14. Provide sex nuts and bolts mounting for closers on all wood doors without hardwood internal blocking.

2.10 MAGNETIC DOOR HOLDERS

1. Where called for in the hardware set numbers, provide a wall mounted electromagnetic door release.
2. The hardware supplier shall verify the voltage required for this item.
3. Products of the following manufacturers will be acceptable for this project:

Sargent	1500 Series
Norton Door Controls	6900 Series

2.11 DOOR STOPS:

1. It shall be the responsibility of the hardware supplier to provide door stops for all doors in accordance with the following requirements.
2. Wall type bumpers with a concealed type flange shall be used wherever possible and shall be one of the following:
   Ives - 407 1/2
   Hager - 236W
   Rockwood - 409

3. Where wall type bumpers cannot be used, such as on unreinforced partitions or in situations where door comes in contact with material such as glass, or any other obstruction, provide dome type floor stops of the proper height.
   Ives - 436, 438
   Hager - 241F, 243F
   Rockwood - 440, 442

4. Exterior doors striking masonry and other doors specified to have door holders shall have cast bronze wall or floor type door stops holders with hook or staple to engage door and to selectively hold in open position. The following will be acceptable:
   Ives - 452-5
   Hager - 270D

2.12 SURFACE OVERHEAD DOOR STOP & HOLDER:

1. Exterior doors, except for those requiring door closers, and where specified, shall be provided with a surface mounted, extra heavy duty overhead door holder and shock absorber. Each door holder shall have a case hardened steel engagement and stop plate, placed between the bronze arms at center pivot. The hold-open feature shall engage and release the door automatically by means of a small handle. The shock absorber shall be encased in an extruded bronze door bracket to be applied to the door by no less than four (4) sex bolts.

2. The following products will be acceptable:
   Glynn-Johnson - 90H Series

2.13 SILENCERS:

1. Provide rubber silencers for all interior pressed steel (hollow metal) frames. Silencers shall be pneumatic type 1/2" diameter with 1/8" projection.
2. Provide 3 silencers for the strike jamb of metal frames for single doors and two for the head for metal frames for pairs of doors. Provide 4 silencers for the strike jamb for frames for single dutch doors.

2.14 PUSH - KICK - MOP ARMOUR PLATES:

1. Push plates shall be .050 gauge solid bronze 16" high by 8" wide.

2. Kick plates shall be .050 gauge solid bronze 8" high by 2" less door width.
3. Kick plates shall be applied on the push side of all doors where noted.
4. Armor plates shall be .050 gauge solid bronze 40" high by 2" less door width.

2.15 PULLS:

1. Pull units for doors with exit devices and for doors with push plates shall be 1" diameter solid bronze round bar, 10" center to center, with 2 1/2" projection and 1 1/2" clearance. Where used with exit devices, the pull unit shall be through bolted top and bottom. Locate pull below the cylinder for doors with exit devices.

2.16 SURFACE BOLTS:

1. Surface bolts where required shall be steel cadmium plated, having a fire rating for up to 3 hours (A Label). Surface bolts shall have concealed screw fastening. Top bolts shall have a surface applied universal strike and bottom bolts shall have a flat strike.

2. Where surface bolts are specified, it is required that both top and bottom bolts be supplied. For doors up to 7'-6" the top bolt length shall be 8". Where doors are over 7'-6" in height the surface bolt length shall be increased in increments of 6" for each 6" of additional door height.
3. The following products will be acceptable:
   Glynn-Johnson - 1630
   Ives - 453
   Hager - 275D

2.17 FLUSH BOLTS:

1. Extension flush bolts shall have forged bronze face plate with extruded brass lever and with wrought brass guide and strike. Rods for flush bolts shall be 12" steel or brass for doors up to 7'-6" in height. Where doors are over 7'-6" in height the flush bolt rod length shall be increased in increments of 6" for each 6" of additional door height. Plate size shall be 6 3/4" x 1" to meet ANSI A115 and SDI specifications. Bolt projection shall be 5/8".
2. Floor strikes for flush bolts shall be dustproof type cast or extruded bronze with cast bronze floor plate minimum 3 1/2" x 1 5/8" with masonry anchors for concrete floors. Provide a dustproof strike, for sill application, for all bottom flush bolts for all pairs of doors.
3. The following products will be acceptable:
   Ives - 458
   Hager - 282D

2.18 SELF-LATCHING FLUSH BOLTS:

1. All pairs of wood or hollow metal doors, having a fire rating listing of A (3 hour) B (1 hour or 1 1/2 hour) and C-D or E, shall require self-latching flush bolts, one top and one bottom for each inactive leaf. Upon closing, the active leaf shall actuate the cam which in turn shall move the lever in a vertical direction, thus projecting the bolt to its full 3/4" throw. The bolt mechanism shall have vertical adjustment of up to 2 inches.
2. Floor strikes for flush bolts shall be dust-proof type, cast or extruded bronze, with cast floor plates minimum 3 1/2" x 1 5/8" with masonry anchors for concrete floors.

3. The following products will be acceptable:
   Glynn-Johnson - FB9 - FB10
   Ives - 356 - 357
   Hager - 293D - 294D

2.19 COORDINATORS:

1. Where pairs of fire rated doors occur, with astragals, provide a non-handed, steel housing, automatic coordinating device. This coordinator shall be surface applied to the underside of the stop at the head and shall contain an active door holding lever and a trigger mechanism for the inactive leaf. When the active door leaf is opened, the door lever for that leaf shall project into the opening, and hold the active leaf in the open position until the inactive door activates the trigger mechanism to allow the active leaf to close.
2. The coordinator shall be furnished in the correct length to span the entire width of the opening.
3. The finish of the coordinator shall be prime coat to receive the same finish paint as the door frame.
4. The following products will be acceptable:
   Ives - 900 Series
   Glynn Johnson - COR Series
   Hager - 297D

2.20 HANDICAP DOOR OPERATORS:

1. The operator shall be a Horton 7000 series low energy electro-mechanical door operator.
2. The operator shall be powered open with a DC motor working through six reduction gears.
3. Closing shall be by spring force.
4. The motor is to be off when the door is in the closing mode.
5. The door can be manually operated with power on or off without damage to the operator.
6. The operator shall be actuated by No. C-1260 push plate switch mounted on both sides of door opening.
7. The operator shall include the following variable adjustments to enable it to comply with ANSI A156.19
   Opening speed - 3 to 5 Seconds
   Closing speed - 3 to 5 Seconds
   Time Delay before Closing - 2 - 25 Seconds
8. The operator shall be mounted in an extruded aluminum cover.
9. It is the responsibility of the finish hardware supplier to include installation of the handicap door operator. This includes installation of this unit only. All wiring (line voltage and low voltage) to be done by the Electrician.
10. All wiring information to be supplied to the general contractor in a timely fashion by the finish hardware supplier.

2.21 THRESHOLDS - WEATHERSTRIPPIONG – DOOR BOTTOMS:

1. For all exterior doors not requiring floor closers, provide a flat extruded or cast aluminum threshold as detailed on drawings. Anchor thresholds with no less than four (4) machine screw anchors for 3'0" lengths. Provide non ferrous solid brass or stainless steel screws.
2. For all exterior hollow metal doors, provide an extruded aluminum perimeter seal with

neoprene gasketing material (weatherstripping) for head and jambs. The neoprene seals shall be an airfoil design to permit full and positive closure between door and jamb. The continuous aluminum brackets shall be applied on the stop with stainless steel sheet metal screws at the corner of the rabbet located so as to provide full closure at the head and jamb perimeters. Where the door comes in contact with the frame, the maximum projection for the continuous aluminum weatherstripping brackets shall be no more than 1/4".

3. Weatherstripping (gasketing material) shall be classified by Underwriters Laboratories for application on fire door frames, for openings rated up to 3 hours.
4. The door bottom seal for exterior doors shall be concealed in the bottom of the door and shall be a flexible synthetic vinyl that will not take a formal set, nor break or flake in cold weather. The door bottom seal shall extend the full width of the door and shall also extend below the door bottom and compress against the top for the threshold, for complete closure. The door bottom seal shall be fastened to the recessed channel with 3 or 4 screws through the seal or the seal chassis.

2.22 FINISH:

1. With the exceptions of hinges, door closers, plates, coordinators, thresholds and weatherstripping, all hardware items shall be furnished in satin chrome 26D

2. Exceptions are as follows:
   Hinges: Satin Chrome 26D
   Coordinators: USP
   Door Closers: Sprayed Aluminum
   Plates: Satin Chrome 26D
   Push Bars: Satin Chrome 26D
   Pulls: 10B Satin chrome 26D
   Thresholds: Clear Anodized
   Weatherstripping: Clear Anodized
   Exit Devices for Aluminum Doors: 32D Satin Stainless Steel
   Door Closers for Aluminum Doors: Sprayed Aluminum

2.23 HARDWARE SET NUMBERS:

1. See door schedule for required hardware at each door.

PART 3 - EXECUTION:

3.1 INSPECTION: It shall be the general contractors responsibility to inspect all door openings and doors to determine that each door and door frame has been properly prepared for the required hardware. If errors in dimensions or preparation are encountered, they are to be corrected by the responsible parties prior to the installation of hardware.

3.2 PREPARATION: All doors and frames, requiring field preparation for finish hardware, shall be carefully mortised, drilled for pilot holes, or tapped for machine screws for all items of finish hardware in accordance with the manufacturers templates and instructions.

3.3 INSTALLATION/ADJUSTMENT/LOCATION

A. All materials shall be installed in a workmanlike manner following the manufacturer's recommended instructions.

B. Exit devices shall be carefully installed so as to permit friction free operation of crossbar, touch bar, thumb latch, lever or knob. Latching mechanism shall also operate freely without friction or binding.

C. Door closers shall be installed in accordance with the manufacturer's instructions. Each door closer shall be carefully installed, on each door, at the degree of opening indicated on the hardware schedule. Arm position shall be as shown on the instruction sheets and required by the finish hardware schedule.

D. The adjustments for all door closers shall be the contractor's responsibility and these adjustments shall be made at the time of installation of the door closer. The closing speed and latching speed valves, shall be adjusted individually to provide a smooth, continuous closing action without slamming. The delayed action feature or back check valve shall also be adjusted so as to permit the corrected delayed action cycle or hydraulic back check cushioning of the door in the opening cycle. All valves must be properly adjusted at the time of installation. Each door closer has adjustable spring power capable of being adjusted, in the field, from size 2 thru 6. It shall be the contractors responsibility to adjust the spring power for each door closer in exact accordance with the spring power adjustment chart illustrated in the door closer installation sheet packed with each door closer.

E. Installation of all other hardware, including locksets, push-pull latches, overhead holders, door stops, plates and other items, shall be carefully coordinated with the hardware schedule and the manufacturers instruction sheets.

F. Locations for finish hardware shall be in accordance with dimensions listed in the pamphlet "Recommended locations for Builders' Hardware" published by the Door and Hardware Institute.

3.4 FIELD QUALITY CONTROL: Upon completion of the installation of the finish hardware, it shall be the responsibility of the finish hardware supplier to visit the project and to examine the hardware for each door on which he has provided hardware and to verify that all hardware is in proper working order. Should he find items of hardware not operating properly, he should make a report, in writing, to the general contractor, advising him of the problem and the measures required to correct the problem.

3.5 PROTECTION: All exposed portions of finish hardware shall be carefully protected, by use of cloth, adhesive backed paper or other materials, immediately after installation of the hardware item on the door. The finish shall remain protected until completion of the project. Prior to acceptance of the project by the architect and owner, the general contractor shall remove the protective material exposing the hardware finish.

3.6 CLEANING: It shall be the responsibility of the general contractor to clean all items of finish hardware and to remove any remaining pieces of protective materials and labels.

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Doors.

B. Related Sections:

1. Division 08 Section "Flush Wood Doors" for wood doors to be factory glazed.

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit.

1.4 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

1.5 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

C. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Product Certificates: For glass and glazing products, from manufacturer.

1.6 QUALITY ASSURANCE

A. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

C. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA's "Glazing Manual."

D. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

E. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, whether glazing is for use in fire doors or other openings, whether or not glazing passes hose-stream test, whether or not glazing has a temperature rise rating of 450 deg F, and the fire-resistance rating in minutes.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

2.2 GLASS PRODUCTS

A. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
2. For uncoated glass, comply with requirements for Condition A.

2.3 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

G. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.4 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

2.5 MONOLITHIC-GLASS TYPES

A. Tempered Glass: Clear fully tempered float glass.

1. Thickness: 6.0 mm.
2. Provide safety glazing labeling.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches.

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 08 80 00

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes non-load-bearing steel framing members for the following applications:

1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).
2. Interior suspension systems (e.g., supports for ceilings, suspended soffits, etc.).

B. Related Sections include the following:

1. Division 07 Section "Fire-Resistive Joint Systems" for head-of-wall joint systems installed with non-load-bearing steel framing.
2. Division 09 Section "Gypsum Board Shaft Wall Assemblies" for non-load-bearing metal shaft-wall framing, gypsum panels, and other components of shaft-wall assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

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. Steel Framing and Furring:

a. Clark Western Building Systems, UltraSteel™ Framing.
b. Dietrich Industries, Inc., UltraSteel™ Framing.
c. MarinoWare; Division of Ware Ind.
d. National Gypsum Company.
e. The Steel Network, Inc.
f. Unimast, Inc.

2.2 FRAMING SYSTEMS

A. Recycled Content of Steel Products: Provide products with average recycled content of steel products such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

B. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized or equivalent per ASTM A1003.

C. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.

1. Steel Studs and Runners:

a. Minimum Base-Metal Thickness: As indicated on Drawings or not less than 0.032 inch (20 Ga.).
b. Depth: As indicated on Drawings.

2. Dimpled Steel Studs and Runners:

a. Minimum Base-Metal Thickness: As indicated on Drawings or not less than 0.032 inch (20 Ga.).
b. Depth: As indicated on Drawings.

D. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.

3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

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

        1) Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series.
        2) Superior Metal Trim; Superior Flex Track System (SFT).

E. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

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

    a. Fire Trak Corp.; Fire Trak.
    b. Metal-Lite, Inc.; The System.
    c. The Steel Network, Inc.; VertiClip SLD or VertiTrack VTD.
    d. Dietrich: SLP-TRK Slotted Track.

F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 0.0312 inch.

G. Cold-Rolled Channel Bridging: 0.0538-inch bare-steel thickness, with minimum 1/2-inch- wide flanges.

1. Depth: 1-1/2 inches.
2. Clip Angle: 1-1/2 by 1-1/2 inch, 0.068-inch- thick, galvanized steel or BridgeClip by The Steel Network, Inc.

H. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base Metal Thickness: 0.0179 inch.
2. Depth: As indicated on Drawings.

I. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical.

J. Masonry Furring Channels: Adjustable wall furring designed for use on brick or block with cold-rolled channel. Provide No. FCWB by Dietrich or approved substitute.

K. Cold-Rolled Furring Channels: 0.0538-inch bare-steel thickness, with minimum 1/2-inch- wide flanges.

1. Depth: 3/4 inch.

2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare-steel thickness of 0.0312 inch.
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch-diameter wire, or double strand of 0.0475-inch- diameter wire.

L. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- diameter wire, or double strand of 0.0475-inch- diameter wire.

B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch diameter.

C. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.

D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch- wide flanges.

1. Depth: 1-1/2 inches.

E. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.0538-inch bare-steel thickness, with minimum 1/2-inch- wide flanges, 3/4 inch deep.
2. Steel Studs: ASTM C 645.

a. Minimum Base-Metal Thickness: 0.0179 inch.
b. Depth: As indicated on Drawings.

3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.

a. Minimum Base Metal Thickness: 0.0179 inch.

4. Resilient Furring Channels: 1/2-inch- deep members designed to reduce sound transmission.

a. Configuration: Asymmetrical.

F. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

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. Armstrong World Industries, Inc.; Drywall Grid Systems.
b. Chicago Metallic Corporation; 640-C Drywall Furring System.
c. USG Corporation; Drywall Suspension System.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.

1. Space studs as follows:

a. Single-Layer Construction: 16 inches o.c., unless otherwise indicated.
b. Multilayer Construction: 16 inches o.c., unless otherwise indicated.

C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

a. Install two 0.312 inch (0.79 mm) (20 gage) studs at each jamb, unless otherwise indicated.
b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

D. Direct Furring:

1. Screw to wood framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

E. Z-Furring Members:

1. Erect insulation (specified in Division 07 Section "Thermal Insulation") vertically and hold in place with Z-furring members spaced 24 inches o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING SUSPENSION SYSTEMS

A. Install suspension system components in sizes and spacings indicated on Drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

    a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

    a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
5. Do not attach hangers to steel roof deck.
6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09 22 16

SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Interior gypsum board.

B. Related Sections include the following:

1. Division 05 Section "Cold-Formed Metal Framing" for load-bearing steel framing that supports gypsum board.
2. Division 06 Section "Rough Carpentry" for wood framing and furring that supports gypsum board.
3. Division 06 Section "Sheathing" for gypsum sheathing.
4. Division 07 Section "Thermal Insulation" for insulation and vapor retarders installed in assemblies that incorporate gypsum board.
5. Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board.
6. Division 09 Section "Gypsum Board Shaft Wall Assemblies" for metal shaft-wall framing, gypsum shaft liners, and other components of shaft-wall assemblies.
7. Division 09 painting Sections for primers applied to gypsum board surfaces.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.

1.4 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

1.5 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PANELS, GENERAL

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

B. Regional Materials: Gypsum panel products shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

2.2 INTERIOR GYPSUM BOARD

A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

1. 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:

a. American Gypsum Co.
b. BPB America Inc.
c. G-P Gypsum.

d. Lafarge North America Inc.
e. National Gypsum Company.
f. PABCO Gypsum.
g. Temple.
h. USG Corporation.

B. Regular Type:

1. Thickness: 5/8 inch.
2. Long Edges: Tapered.

2.3 SPECIALTY GYPSUM BOARD

A. Glass-Mat Interior Gypsum Board: ASTM C 1658/C 1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.

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

a. Georgia-Pacific Gypsum LLC; DensArmour Plus.

2. Core: 5/8 inch, Type X.
3. Long Edges: Tapered.
4. Mold Resistance: ASTM D 3273, score of 10.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material:

a. Galvanized or aluminum-coated steel sheet or rolled zinc.
b. Plastic where abutting exterior metal doors and windows.

2. Shapes:

a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. L-Bead: L-shaped; exposed long flange receives joint compound.
d. Expansion (control) joint.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Wallboard: Paper.
2. Mold-Resistant Gypsum Wallboard: 10-by-10 glass mesh.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Pre-filling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.

    a. Use setting-type taping with mold-resistant gypsum wallboard.

3. Fill Coat: For second coat, use setting-type, sandable topping or drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: Not required.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

D. Acoustical Joint Sealant: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

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

    a. Pecora Corporation; AC-20 FTR or AIS-919.
    b. USG Corporation; SHEETROCK Acoustical Sealant.

2. Provide sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. Thermal Insulation: As specified in Division 07 Section "Thermal Insulation."

F. Vapor Retarder: As specified in Division 07 Section "Thermal Insulation."

G. Firestopping: As specified in Division 07 Section “Penetration Firestopping.”

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Provide sealant bed at flanges of electrical boxes prior to application of gypsum panels.

F. Form control and expansion joints with space between edges of adjoining gypsum panels.

G. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

I. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

J. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

K. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

L. Fire-Resistance-Rated Gypsum Board Assemblies: Provide firestop system at the top of fire-resistance-rated gypsum board assemblies. Provide firestop system around any structural penetration of wall assembly.

M. Smoke-Rated Gypsum Board Assemblies: Provide a tight, taped joint at the top of smoke-rated assemblies and around any penetrations to assemblies at both side of the assembly. The use of acoustical sealant will be acceptable to fill gaps up to 3/8 inch wide.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Regular Type: As indicated on Drawings.
2. Type X: Where required for fire-resistance-rated assembly.
3. Moisture- and Mold-Resistant Type: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels as follows:

    a. Vertically (parallel to framing) for metal framing.
    b. Horizontally (perpendicular to framing) for wood framing.
    c. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    d. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings or according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners, unless otherwise indicated.
2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Where indicated on Drawings.
3. Level 3: Where indicated on Drawings.
4. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.

    a. Primer and its application to surfaces are specified in other Division 09 Sections.

5. Level 5: Not required.

3.6 FIELD QUALITY CONTROL

A. Above-Ceiling Observation: Before Contractor installs gypsum board ceilings, conduct an above-ceiling observation and report deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.

1. Complete the following in areas to receive gypsum board ceilings:

a. Installation, insulation, and leak and pressure testing of water piping systems.
b. Installation of air-duct systems.
c. Installation of air devices.
d. Installation of mechanical system control-air tubing.
e. Installation of ceiling support framing.
f. Installation of Penetration Firestopping.

3.7 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes acoustical panels and exposed suspension systems for ceilings.

1.3 DEFINITIONS

A. AC: Articulation Class.

B. CAC: Ceiling Attenuation Class.

C. LR: Light Reflectance coefficient.

D. NRC: Noise Reduction Coefficient.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Acoustical Panel: Set of 6-inch- square Samples of each type, color, pattern, and texture.
2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- long Samples of each type, finish, and color.

C. Maine State Housing Authority Green Standards Submittals:

1. Product Data for products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.

    a. Include statement indicating costs for each product having recycled content.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each acoustical panel ceiling.

E. Maintenance Data: For finishes to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.

B. Source Limitations:

1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
2. Suspension System: Obtain each type through one source from a single manufacturer.

1.6 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:

1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

   a. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
   b. Identify materials with appropriate markings of applicable testing and inspecting agency.

2. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:

   a. Smoke-Developed Index: 450 or less.

B. Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:

1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with IBC.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

1.9 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: Full-size panels equal to 2.0 percent of quantity installed.
2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.
3. Hold-Down Clips: Equal to 2.0 percent of quantity installed.

PART 2 - PRODUCTS

2.1 ACOUSTICAL PANELS, GENERAL

A. Recycled Content: Provide acoustical panels with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content constitutes a minimum of 25 percent by weight.

B. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface per ASTM E 795.

C. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

D. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Where indicated, provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.2 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

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

1. Armstrong World Industries, Inc.; Fine Fissured No. 1728.
2. BPB USA; HHF-157.
3. USG Interiors, Inc.; Radar ClimaPlus No. 2210.

B. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:

1. Type and Form: Type III, mineral base with painted finish; Form 1, nodular or 2, water felted.
2. Pattern: CE (perforated, small holes and lightly textured) and I (embossed).

C. Color: White.

D. LR: Not less than 0.80.

E. NRC: Not less than 0.55.

F. CAC: Not less than 35.

G. Edge/Joint Detail: Square.

H. Thickness: 5/8 inch.

I. Modular Size: 24 by 24 inches.

J. Antimicrobial Treatment: Broad spectrum fungicide and bactericide based.

2.3 METAL SUSPENSION SYSTEMS, GENERAL

A. Recycled Content: Provide products made from steel sheet with average recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

B. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

C. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

D. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

E. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.

F. Hanger Rods or Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

G. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch- thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.

H. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

1. Available Product: UHDC by Armstrong or L15 by USG.

2.4 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

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

1. Prelude 15/16" Exposed Tee System (7300 Series); Armstrong World Industries, Inc.
2. S11 System; Celotex Corporation.
3. 1200 System; Chicago Metallic Corporation.
4. DX 24 System; USG Interiors, Inc.

B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation, with prefinished 15/16-inch- wide metal caps on flanges.

1. Structural Classification: Intermediate-duty system.
2. End Condition of Cross Runners: Override (stepped) or butt-edge type, as standard with manufacturer.
3. Face Design: Flat, flush.
4. Cap Material: Steel cold-rolled sheet or aluminum.
5. Cap Finish: Painted white.

2.5 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners, unless otherwise indicated.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Hangers shall be single lengths of wire without splices; coordinate lengths in deep ceiling cavities.
2. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
3. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

4. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
5. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
6. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
7. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
8. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
9. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
10. Do not attach hangers to steel deck tabs.
11. Do not attach hangers to steel roof deck. Attach hangers to structural members.
12. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
13. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Suspension system shall be reinforced to support diffusers, light fixtures and any additional members. Install hanger wires to grid at each corner of light fixtures. Coordinate location with electrical and other trades.

1. Each individual fixture and attachment with combined weight of 56 pounds or less shall have two 12-gage wire hangers attached at diagonal corners of the fixture. These wires shall be slack. Fixtures and attachments with a combined weight of greater than 56 pounds shall be independently supported from the structure at all four corners.

E. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

F. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

G. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. Arrange directionally patterned acoustical panels as follows:

a. As indicated on reflected ceiling plans.
b. Install panels with pattern running in one direction parallel to long axis of space.

2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
3. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
4. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
5. Install hold-down clips in areas within 10 feet of exterior doors or vestibule doors; space as recommended by panel manufacturer's written instructions, unless otherwise indicated or required.

3.4 FIELD QUALITY CONTROL

A. Above-Ceiling Observation: Before Contractor installs acoustical panel ceilings, conduct an above-ceiling observation and report deficiencies in the Work observed. Do not proceed with installation of acoustical panels until deficiencies have been corrected.

1. Complete the following in areas to receive gypsum board ceilings:

a. Installation of 80 percent of lighting fixtures, powered for operation.
b. Installation, insulation, and leak and pressure testing of water piping systems.
c. Installation of air-duct systems.
d. Installation of air devices.
e. Installation of mechanical system control-air tubing.
f. Installation of penetration firestopping.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

SECTION 09 65 00

RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Heat Welded Sheet vinyl floor coverings.
   2. Resilient wall base and accessories.

1.2 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For flooring installed on walkway surfaces, provide products with the values indicated as determined by testing identical products per ASTM C 1028.

1.3 SUBMITTALS

A. Product Data: For each type of product specified.

B. Samples for Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors and patterns available for each type of product indicated.
   1. For resilient accessories, manufacturer's standard-size samples, but not less than 12 inches long, of each resilient accessory color and pattern specified.
   2. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.

C. Seam Samples: For seamless-installation technique indicated and for each floor covering product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to a rigid backing and prepared by Installer for this Project.

D. Product Certificates: Signed by manufacturers of resilient products certifying that each product furnished complies with requirements.

E. Maintenance Data: For resilient flooring to include in the maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor covering installation and seaming method indicated.
   1. Engage an installer who employs workers for this Project who are trained or certified by floor covering manufacturer for installation techniques required.

B. Source Limitations: Obtain each type, color, and pattern of product specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

C. Fire-Test-Response Characteristics: Provide products with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Critical Radiant Flux: 0.45 W/sq. cm or greater when tested per ASTM E 648.
   2. Smoke Density: Maximum specific optical density of 450 or less when tested per ASTM E 662.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Project site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 50 and 90 deg F.

C. Store rolls upright.

D. Move products into spaces where they will be installed at least 48 hours before installation, unless longer conditioning period is recommended in writing by manufacturer.

1.6 PROJECT CONDITIONS

A. Maintain a temperature of not less than 70 deg F or more than 95 deg F in spaces to receive products for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After post installation period, maintain a temperature of not less than 55 deg F or more than 95 deg F.

B. Do not install products until they are at the same temperature as the space where they are to be installed.

C. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.

D. Install products and accessories after other finishing operations, including painting, have been completed.

E. Where demountable partitions and other items are indicated for installation on top of resilient tile flooring, install tile before these items are installed.

F. Do not install flooring over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by flooring manufacturer's recommended bond and moisture test as well as acceptable pH range.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
   1. Furnish not less than 10 linear feet in roll form of each different composition, wearing surface, color, and pattern of sheet floor covering installed.
   2. Furnish not less than 10 linear feet for each type, color, pattern, and size of resilient accessory installed.
   3. Deliver extra materials to Owner.

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, those indicated in the following paragraphs of Part 2.

2.2 SHEET VINYL FLOOR COVERINGS

A. Sheet Vinyl: Where this designation is indicated, provide sheet vinyl floor covering with backing complying with ASTM F 1303 and the following:
   1. Available Products: As follows:
      a. Armstrong Medintech Tandem.
   2. Color and Pattern: As selected by Architect from manufacturer's full range of colors and patterns produced for sheet vinyl floor covering complying with requirements indicated. Up to two (2) colors shall be selected by the Architect.
   3. Type (Binder Content): Type II, minimum binder content of 34 percent.
   4. Wear-Layer Thickness: Minimum Grade 1 thickness according to ASTM F 1303 for Type indicated.
   5. Static Coefficient of Friction: Level Surfaces, minimum 0.6.
   6. Overall Thickness: As specified by manufacturer's product designation indicated above.
   7. Wearing Surface: Smooth.
   8. Backing Class: Class A (fibrous).
   9. Sheet Width: As standard with manufacturer for product designation indicated above.
   10. Seaming Method: Heat welded.
   11. Base: Provide integral flash coved wall base.
   12. Cove Filler: 1” radius, Johnsonite CFS-00-M or approved equal.
   13. Base Cap: Extruded aluminum J-molding for 0.080” material.
   14. Application: Bathrooms and Clinic Areas

2.3 RESILIENT ACCESSORIES

A. Vinyl Base: Where this designation is indicated, provide rubber wall base complying with FS SS-W-40, Type I and the following:
   1. Products: As follows:
      a. Armstrong World Industries

b. Johnsonite.
2. Color and Pattern: As selected by Architect from manufacturer's full range of colors and patterns produced for vinyl wall base complying with requirements indicated.
3. Style: Cove with top-set toe.
4. Minimum Thickness: 1/8 inch.
5. Height: 4 inches.
6. Lengths: 120 feet (36.6 m) long.
7. Outside Corners: Job formed.
8. Inside Corners: Job formed.
9. Surface: Smooth.

B. Vinyl Accessory Molding: Where this designation is indicated, provide vinyl accessory molding complying with the following:
1. Available Products: As follows:
a. Johnsonite.
2. Color: As selected by Architect from manufacturer's full range of colors produced for vinyl accessory molding complying with requirements indicated.
3. Transition Strip between Sheet Vinyl and Carpet: CTA-XX-H by Johnsonite or approved substitute.

2.4 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated.

B. Stair-Tread-Nose Filler: Two-part epoxy compound recommended by resilient tread manufacturer to fill nosing substrates that do not conform to tread contours.

C. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
a. VCT Adhesives: 50 g/L.
b. Cove Base Adhesives: 50 g/L.

D. Seamless-Installation Accessories:
1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
a. Color: Match floor covering.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where installation of resilient products will occur, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other manufacturer's requirements. Verify that substrates and conditions are satisfactory for resilient product installation and comply with requirements specified.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
   1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond.
   2. Verify that adhesion and dryness characteristics have been determined as required in Division 7 Section “Vapor Retarders, Vapor Barriers, and Air Barriers” and meet flooring manufacturer’s recommendations.
   3. Subfloor finishes comply with requirements specified in Division 3 Section "Cast-in-Place Concrete" for slabs receiving resilient flooring.
   4. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

C. For wood subfloors, verify the following:
   1. Underlayment over subfloor complies with requirements specified in Division 6 Section "Rough Carpentry."
   2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond, show through surface, or stain flooring.

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

3.2 PREPARATION

A. General: Comply with resilient product manufacturer's written installation instructions for preparing substrates indicated to receive resilient products.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.

C. Use stair-tread-nose filler, according to resilient tread manufacturer's written instructions, to fill nosing substrates that do not conform to tread contours.

D. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

E. Broom and vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 SHEET FLOORING INSTALLATION

A. General: Comply with sheet floor covering manufacturer's written installation instructions.

B. Unroll sheet floor coverings and allow them to stabilize before cutting and fitting, if recommended in writing by manufacturer.

C. Lay out sheet floor coverings to comply with the following requirements:
   1. Maintain uniformity of sheet floor covering direction.
   2. Arrange for a minimum number of seams and place them in inconspicuous and low-traffic areas, and not less than 6 inches away from parallel joints in flooring substrates.

3. Match edges of sheet floor coverings for color shading and pattern at seams according to manufacturer's written recommendations.
4. Avoid cross seams.

D. Scribe, cut, and fit sheet floor coverings to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.

E. Extend sheet floor coverings into toe spaces, door reveals, closets, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent, nonstaining marking device.

G. Adhere sheet floor coverings to flooring substrates to comply with floor covering manufacturer's written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
1. Produce completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

H. Seamless Installation:
1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and use welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor covering surfaces. Coordinate welding rod with sheet vinyl color and pattern, as available by manufacturer.

I. Hand roll sheet floor coverings in both directions from center out to embed floor coverings in adhesive and eliminate trapped air. At walls, door casings, and other locations where access by roller is impractical, press floor coverings firmly in place with flat-bladed instrument.

3.4 RESILIENT ACCESSORY INSTALLATION

A. General: Install resilient accessories according to manufacturer's written installation instructions.

B. Apply resilient wall base to walls, columns, pilasters, casework and cabinets in toe spaces, locker bases, and other permanent fixtures in rooms and areas where base is required.
1. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
2. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
3. Do not stretch base during installation.
4. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
5. Form outside corners on job from straight pieces of maximum lengths possible, without whitening at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.

6. Form inside corners on job, from straight pieces of maximum lengths possible, by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

C. Place resilient accessories so they are butted to adjacent materials and bond to substrates with adhesive. Install reducer strips at edges of flooring that would otherwise be exposed.
1. Locate reducer strips or transition strips to line up centered under doors, unless noted otherwise.

D. Apply resilient products to stairs as indicated and according to manufacturer's written installation instructions with epoxy adhesive and nose filler.

3.5 CLEANING AND PROTECTING

A. Perform the following operations immediately after installing resilient products:
1. Remove adhesive and other surface blemishes using cleaner recommended by resilient product manufacturers.
2. Sweep or vacuum floor thoroughly.
3. Do not wash floor until after time period recommended by flooring manufacturer.
4. Damp-mop floor to remove marks and soil.

B. Clean floor surfaces as soon as possible after installation. Clean products according to manufacturer's written recommendations.
1. After cleaning, apply polish to floor surfaces to provide protective floor finish according to flooring manufacturer's written recommendations. Apply stain resistant sealer under polish as recommended by manufacturer at all areas to receive VCT. Coordinate with Owner's maintenance program.
2. Protect flooring with covers from time of installation to time of polish application per manufacturer’s written instructions.

3.6 WASTE MANAGEMENT

A. Separate waste in accordance with the Waste Management Plan and place in designated areas fin the following categories for reuse:
1. Sheet materials larger than 2 square feet.

B. Close and seal tightly all partly used adhesive containers and store protected in well-ventilated, fire-safe area at moderate temperatures.

END OF SECTION 09 65 00

SECTION 09 68 16

SHEET CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Tufted carpet for glue down installation.

B. Related Sections include the following:

1. Division 09 Section "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet.

1.3 SUBMITTALS

A. Product Data: For the following, including installation recommendations for each type of substrate:

1. Carpet: For each type indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
2. Carpet Cushion: For each type indicated. Include manufacturer's written data on physical characteristics and durability.

B. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet: 12-inch- square Sample.
2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch long Samples.
3. Carpet Seam: 6-inch Sample.
4. Carpet Cushion: 6-inch square Sample.

C. Product Data for materials that were extracted, processed, and manufactured within 500 miles of the home.

1. Recycled Content: Provide materials that include at least 25% postconsumer or 50% preconsumer (postindustrial) recycled material.
2. Low or No emissions of VOC: Provide adhesive materials that comply with VOC limits in reference tables.

D. Product Schedule: For carpet Use same designations indicated on Drawings.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.

F. Maintenance Data: For carpet to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet.

G. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

B. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

C. Mockups: Before installing carpet, build mockups to verify seam construction and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104, Section 5, "Storage and Handling."

1.6 PROJECT CONDITIONS

A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."

B. Environmental Limitations: Do not install carpet until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

C. Do not install carpet over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.

1.7 WARRANTY

A. Special Warranty for Carpet: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, excess static discharge, and delamination.
3. Warranty Period: 10 years from date of Substantial Completion.

B. Special Warranty for Carpet Cushion: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet cushion installation that fail in materials or workmanship within specified warranty period.

1. Warranty includes consequent removal and replacement of carpet and accessories.
2. Warranty does not include deterioration or failure of carpet cushion due to unusual traffic, failure of substrate, vandalism, or abuse.
3. Failure includes, but is not limited to, permanent indentation or compression.
4. Warranty Period: 10 years from date of Substantial Completion.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet: Full-width rolls equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd..

PART 2 - PRODUCTS

2.1 CARPET

A. Level Loop C & A Field Day (03377) by Tandus Flooring.

1. Product: Field Day #03377
2. Fiber: TDX Nylon
3. Backing: Closed Cell Cushion
4. Face Weight: 18 Oz.
5. Gauge: 1/13
6. Stitches: 10 per inch.
7. Thickness: .117 inch.
8. Width: 6 feet

B. Carpet Emission Limits: All products shall comply with the CRI Green Label Plus Standards.

C. Colors: Selected

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer.

1. VOC Limits: Provide adhesives with VOC content not more than 50g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

C. Tackless Carpet Stripping: Water-resistant plywood, in strips as required to match cushion thickness and that comply with CRI 104, Section 12.2.

D. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet cushion manufacturer.
2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-in-Place Concrete" for slabs receiving carpet. **N/A**
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

C. For wood subfloors, verify the following:

1. Underlayment over subfloor complies with requirements specified in Division 06 Section "Rough Carpentry." **N/A**
2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch, unless more stringent requirements are required by manufacturer's written instructions.

C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet and carpet cushion manufacturer.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

3.3 INSTALLATION

A. Comply with CRI 104 and carpet and carpet cushion manufacturers' written installation instructions for the following:

1. Direct-Glue-Down Installation: Comply with CRI 104, Section 9, "Direct Glue-Down Installation."
2. Stretch-in Installation: Comply with CRI 104, Section 12, "Stretch-in Installation."

B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.

1. Level adjoining border edges.

C. Do not bridge building expansion joints with carpet.

D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.

E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

G. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations.

H. Comply with carpet cushion manufacturer's written recommendations. Install carpet cushion seams at 90-degree angle with carpet seams.

3.4 CLEANING AND PROTECTING

A. Perform the following operations immediately after installing carpet:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
2. Remove yarns that protrude from carpet surface.
3. Vacuum carpet using commercial machine with face-beater element.

B. Protect installed carpet to comply with CRI 104, Section 16, "Protection of Indoor Installations."

C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer and carpet cushion and adhesive manufacturers.

END OF SECTION 09 68 16

SECTION 09 91 23

INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Gypsum board.
2. Steel.
3. Wood.
4. Masonry.

B. This Section includes exposed interior items and surfaces with low VOC coatings complying with ME DEP regulations.

C. Related Sections include the following:

1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
2. Division 06 Sections for shop priming carpentry with primers specified in this Section.
3. Division 08 Sections for factory priming windows and doors with primers specified in this Section.
4. Division 09 painting Sections for special-use coatings.
5. Division 09 Section "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood substrates.

1.3 SUBMITTALS

A. Product List: For each product indicated, include the following:

1. Product data.
2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
3. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
4. Include printed statement of VOC content for each product.

B. Samples for Initial Selection: For each type of topcoat product indicated.

C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced Applicator who has completed painting system applications similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications 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. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of general wall paint system specified in Part 3.

a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft..
b. Other Items: Architect will designate items or areas required.

2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
3. Final approval of color selections will be based on benchmark samples.

a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

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 the following:

1. Benjamin Moore & Co.
2. Sherwin Williams
3. ICI Paints

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Flat Paints, Coatings, and Primers: VOC content of not more than 50 g/L.
2. Nonflat Paints, Coatings, and Primers: VOC content of not more than 150 g/L.
3. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
4. Floor Coatings: VOC not more than 100 g/L.
5. Shellacs, Clear: VOC not more than 730 g/L.
6. Shellacs, Pigmented: VOC not more than 550 g/L.
7. Flat Topcoat Paints: VOC content of not more than 50 g/L.
8. Nonflat Topcoat Paints: VOC content of not more than 150 g/L.
9. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
10. Floor Coatings: VOC not more than 100 g/L.
11. Shellacs, Clear: VOC not more than 730 g/L.
12. Shellacs, Pigmented: VOC not more than 550 g/L.
13. Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
14. Dry-Fog Coatings: VOC content of not more than 400 g/L.
15. Zinc-Rich Industrial Maintenance Primers: VOC content of not more than 340 g/L.
16. Pre-Treatment Wash Primers: VOC content of not more than 420 g/L.

C. Chemical Components of Field-Applied Interior Paints and Coatings: Provide topcoat paints and anti-corrosive and anti-rust paints applied to ferrous metals that comply with the following chemical restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
2. Restricted Components: Paints and coatings shall not contain any of the following:

a. Acrolein.
b. Acrylonitrile.
c. Antimony.
d. Benzene.
e. Butyl benzyl phthalate.
f. Cadmium.
g. Di (2-ethylhexyl) phthalate.
h. Di-n-butyl phthalate.
i. Di-n-octyl phthalate.
j. 1,2-dichlorobenzene.
k. Diethyl phthalate.
l. Dimethyl phthalate.
m. Ethylbenzene.
n. Formaldehyde.
o. Hexavalent chromium.
p. Isophorone.
q. Lead.
r. Mercury.
s. Methyl ethyl ketone.
t. Methyl isobutyl ketone.
u. Methylene chloride.
v. Naphthalene.
w. Toluene (methylbenzene).
x. 1,1,1-trichloroethane.
y. Vinyl chloride.

D. Colors: Provide color selections made by the Architect. Allow for up to ten (10) different color selections. Each color may be specified in varying sheens for varying substrates.

2.3 PRIMERS/SEALERS

A. Low-VOC Latex Primer/Sealer:

1. Moore: Pristine Eco Spec Interior Latex Primer Sealer, No. 231

B. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.

2.4 METAL PRIMERS

A. Rust-Inhibitive Primer (Water Based):

1. Moore: IMC Acrylic Metal Primer M04. (51 g/L)

2.5 LATEX PAINTS

A. Low-VOC Latex (Flat):

1. Moore: Pristine Eco Spec Interior Latex Flat, No. 219.

B. Low-VOC Latex (Low Luster):

1. Moore: Pristine Eco Spec Interior Latex Eggshell, No. 223

C. Low-VOC Latex (Semigloss):

1. Moore: Pristine Acrylic Semi-Gloss, No. 214

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints. Uniformly abrade galvanized surfaces with a palm sander and 60 grit aluminum oxide so surface is free of oil and surface contaminants.

H. Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

I. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

J. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.

2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Apply an additional coat of primer on metal surfaces that have been shop primed.

B. Tinting: Tint primer of colors such as reds, yellows, and oranges with a gray basecoat system designed to help provide color coverage.

1. Do not tint prime or base coat for multi-colored finishes.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint 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. When using colors such as red, yellow or orange, an extra coat of finish may be necessary. Notify Architect when additional coats do not fix the problem.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:

1. Mechanical, Plumbing and Fire Protection Work:

a. Uninsulated metal piping.
b. Uninsulated plastic piping.
c. Pipe hangers and supports.
d. Tanks that do not have factory-applied final finishes.
e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

2. Electrical Work:

a. Switchgear.
b. Panelboards.
c. Electrical equipment that is indicated to have a factory-primed finish for field painting.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

A. VOC Compliance, General: Provide the manufacturers' formulations for the products specified below that comply with the VOC requirements for the State of Maine Department of Environmental Protection in paragraph 2.2 of this Section.

B. Steel Substrates: Including, but not limited to steel doors and frames, steel stairs (including risers and stringers), handrails and guardrails, lintel plates and angles, wood door glass lite kits and astragals, access panels (both sides), metal fabrications; see Division 05 Section "Metal Fabrications", and miscellaneous metal items.

1. Low-VOC Latex Over DTM Primer System:

    a. Prime Coat: DTM anticorrosive metal primer.
    b. Intermediate Coat: Low-VOC latex paint matching topcoat.
    c. Topcoat: Low-VOC latex semi-gloss paint.

C. Gypsum Board Substrates:

1. Low-VOC Latex System:

    a. Prime Coat: Low-VOC latex primer/sealer.
    b. Intermediate Coat: Low-VOC latex paint matching topcoat.
    c. Topcoat: Low-VOC latex (eggshell for walls) paint.

2. Low-VOC Latex System For Bathrooms:

    a. Prime Coat: Low-VOC latex primer/sealer.
    b. Intermediate Coat: Low-VOC latex paint matching topcoat.
    c. Topcoat: Low-VOC latex (semi-gloss for walls) paint.

D. Wood For Painted Finish: Including windows and architectural woodwork.

1. Low-VOC Latex System:

    a. Prime Coat: Interior latex-based wood primer.
    b. Intermediate Coat: Low-VOC latex paint matching topcoat.
    c. Topcoat: Low-VOC latex (semigloss) paint.
    d.

E. Wood For Natural Finish: Including windows and architectural woodwork.

1. Low-VOC Polyurethane System:

a. Prime Coat: Stain.
b. Two (2) Intermediate Coats: Water based gloss polyurethane.
c. Topcoat: Water based satin polyurethane.

END OF SECTION 09 91 23

SECTION 10 14 00

SIGNS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following types of signs:

1. Panel signs as shown and as listed herein.

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

1. Division 01 Section "Temporary Facilities and Controls" for temporary project identification signs.
2. Divisions 22 and 23 Sections for labels, tags, and nameplates for mechanical equipment.
3. Division 26 Sections for labels, tags, and nameplates for electrical equipment.
4. Division 26 Section "Interior Lighting Fixtures" for illuminated exit signs.

1.3 SUBMITTALS

A. Product Data: For each type of sign specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.

B. Shop Drawings: Show fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components.

1. Provide message list for each sign required, including large-scale details of wording and lettering layout.
2. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other Sections.

C. Samples: Provide the following samples of each sign component for initial selection of color, pattern and surface texture as required and for verification of compliance with requirements indicated.

1. Samples for selection of color, pattern, and texture:

a. Cast Acrylic Sheet and Plastic Laminate: Manufacturer's color charts consisting of actual sections of material including the full range of colors available for each material required.

1.4 QUALITY ASSURANCE

A. Sign Fabricator Qualifications: Firm experienced in producing signs similar to those indicated for this Project, with a record of successful in-service performance, and sufficient production capacity to produce sign units required without causing delay in the Work.

B. Single-Source Responsibility: For each separate sign type required, obtain signs from one source of a single manufacturer.

C. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

1. Interior Code Signage: Provide signage as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:

a. Illuminated Exit Signs: Refer to Division 26.
b. Elevator Signs: Refer to Division 14.
c. Stairway Identification:
d. Signs for Accessible Spaces:

1) Accessible entrances when not all are accessible (inaccessible entrances shall have directional signage to indicate the route to the nearest accessible entrance.
2) Accessible toilet and bathing facilities when not all are accessible.

2. Notify Architect of details or specifications not conforming to code.

D. Design Concept: The Drawings indicate sizes, profiles, and dimensional requirements of signs and are based on the specific types and models indicated. Sign units by other manufacturers may be considered provided deviations in dimensions and profiles do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

1.5 PROJECT CONDITIONS

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Manufacturers of Panel Signs:

a. Mohawk Sign Systems.
b. Welch Architectural Signage.

2.2 MATERIALS

A. Cast Acrylic Sheet: Provide cast (not extruded or continuous cast) methyl methacrylate monomer plastic sheet, in sizes and thicknesses indicated, with a minimum flexural strength of 16,000 psi when tested according to ASTM D 790, with a minimum allowable continuous service temperature of 176 deg F, and of the following general types:

1. Opaque Sheet: Where sheet material is indicated as "opaque," provide colored opaque acrylic sheet in colors and finishes as selected from the manufacturer's standards.

B. Colored Coatings for Acrylic Plastic Sheet: Use colored coatings, including inks and paints for copy and background colors, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are nonfading for the application intended.

2.3 PANEL SIGNS

A. Substrate: Fabricate signs from 1/8 inch thick matte clear acrylic with edges mechanically and smoothly finished to eliminate cut marks. Background color to be subsurface.

1. Background Color: As selected by the Architect from manufacturer's standard colors.
   a. Provide additional backer sheet, projecting ¼ in. beyond face panel at all sides.
   b. Contrasting color as selected by the Architect.
2. Edge Condition: Beveled.
3. Corner Condition: Rounded to 3/8 inch radius.
4. Size: 6 by 6 inch, unless noted otherwise.

B. Copy: Helvetica.

C. Letterform: route copy into face of substrate 1/32 inch deep. Chemically weld (inlay) computer precision cut tactile copy into routed letter openings so that tactile copy is embedded in substrate and remains at least 1/32" above surface of substrate.

1. Height: 5/8 inch minimum letter height.

D. Braille: Use engrave process for all Braille areas. Engrave Braille dots into surface of clear material.

E. Symbols of Accessibility:

1. Accessible elements: Provide international symbol of accessibility.
   a. Provide male and female symbols as required for toilets.
2. Elevators: Provide symbol containing person on stairs with flame.

F. Provide characters complying with ADA Accessibility Guidelines and ICC/ANSI A117.1. Text shall be accompanied by Grade 2 braille.

2.4 FINISHES

A. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Architect from the manufacturer's standards.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.

1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
2. Locate signs in accordance with approved shop drawings and ADA requirements.

B. Wall-Mounted Panel Signs: Attach panel signs to wall surfaces using the methods indicated below:

1. Vinyl-Tape Mounting: Use double-sided foam tape to mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.

3.2 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

3.3 PANEL SIGN SCHEDULE

A. Provide an informational sign at each room entrance door. Rooms with more than one entrance door shall have a sign at each door. Each informational sign shall include the room name and number.

B. Final room names and numbers will be verified during the submittal.

END OF SECTION 10 14 00

SECTION 10 28 00

TOILET ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Toilet accessories.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Features that will be included for Project.
5. Manufacturer's warranty.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

C. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

D. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.6 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering accessories that may be incorporated into the Work include, but are not limited to, the following:

1. Toilet and Bath Accessories:

a. Bobrick.

B. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, those indicated in the Toilet and Bath Accessory Schedule at the end of Part 3.

2.2 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.

E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.3 TOILET AND BATH ACCESSORIES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated in this section or substitute product by approved substitution.

B. Metal Framed Mirrors: Where this designation is indicated, provide metal framed mirrors complying with the following:

1. Products: B-290 1836 by Bobrick.
2. Capacity: Designed for 4-1/2- or 5-inch- diameter-core tissue rolls.

C. Grab Bars: Where this designation is indicated, provide stainless-steel grab bar complying with the following:

1. Products: B-6206 by Bobrick.
2. Outside Diameter: 1-1/2 inches for heavy-duty applications.
3. Length: As shown.

2.4 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 10 28 00

SECTION 10 44 13

FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fire protection cabinets for the following:

a. Portable fire extinguishers.

B. Related Sections:

1. Division 10 Section "Fire Extinguishers."

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.

1. Fire Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
2. Show location of knockouts for hose valves.

B. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

C. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

D. Maintenance Data: For fire protection cabinets to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

1.5 COORDINATION

A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate size of fire protection cabinets to ensure that type and capacity of fire hoses, hose valves, and hose racks indicated are accommodated.

C. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

B. Stainless-Steel Sheet: ASTM A 666, Type 304.

C. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.2 FIRE PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher.

B. Basis of Design Product: Potter-Roemer 1700 Series, Semi-recessed, white powder coated steel

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

1. J.L. Industries: Cosmopolitan Series .
2. Larsen's: Architectural Series.
3. Potter-Roemer: Alta Series.

D. Cabinet Construction: Fire rated.

E. Cabinet Material: Powder Coated Steel

1. Shelf: Enameled steel.

F. Semi-recessed Cabinet: Cabinet box partially recessed in walls of sufficient depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).

Provide where walls are of insufficient depth for recessed cabinets but are of sufficient depth to accommodate semi-recessed cabinet installation.

1. Rolled-Edge Trim: 2-1/2-inch backbend depth.

G. Cabinet Trim Material: Powder Coated Steel

H. Door Material: Powder Coated Steel Sheet

I. Door Style: Fully glazed panel with frame.

J. Door Glazing: Clear tempered glass, 3 mm.

K. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide projecting door pull and friction latch.
2. Provide manufacturer's standard hinge permitting door to open 180 degrees.

L. Finishes:

1. Manufacturer's standard baked-enamel paint for the following:

2.3 FABRICATION

A. Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Provide factory-drilled mounting holes.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
2. Fabricate door frames of one-piece construction with edges flanged.
3. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 STEEL FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for hose and cabinets to verify actual locations of piping connections before cabinet installation.

B. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for semirecessed fire protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. General: Install fire protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights indicated below:

1. Fire Protection Cabinets: 54 inches above finished floor to top of cabinet.

B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semirecessed fire protection cabinets.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.

E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 210000
FIRE SPRINKLERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

General Provisions of Contract, including General and Supplementary conditions and General Requirements (if any) apply to work specified in this Section.

1.03 DEFINITIONS

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

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

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

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

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

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

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

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

I. Reviewed equal: Shall mean that the Engineer, not the contractor, shall make final determination whether materials are an equal to that which is specified.

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

1.04 DESCRIPTION OF WORK

A. Work Included

Provide all design services, construction documents, labor, transportation, equipment, permits, materials, tools, inspections, incidentals, tests and perform all operations in connection with the **modification of the existing Wet Pipe Sprinkler System in the building to accommodate new wall partitions.** Comply with requirements of all Authorities Having Jurisdiction. Include aesthetic considerations into the design. Coordinate with interfacing trades. Submit equipment and components for review. Prepare Shop and Record Drawings and Owner's Manuals. Assure quality of workmanship. Provide guarantees and warranties. All work shall meet the standards of the most recent edition of the National Fire Protection Association's (NFPA) NFPA 13 Standard for the Installation of Sprinkler Systems.

1.05 SUBMITTALS

A. Shop Drawings:

1. Within 30 working days after the General Contractor has received a fully executed contract, prepare and submit Plans / Shop Drawings in accordance with the requirements of NFPA and obtain the Engineer's approval and Owner's Insurance Underwriter approval before proceeding with the fabrication and work.

2. Drawings shall include, but not be limited to:
   a. Name of Owner and Occupant
   b. Name and address of Contractor.
   c. Physical Location
   d. Plan view of system
   e. Full height cross section or schematic diagram including ceiling construction and spray obstructions, if required.
   f. Locations of all partitions, with fire partitions noted.
   g. Locations of any added concealed spaces
   h. Make, model and nominal K factor of sprinkler heads.
   i. Pipe sizes, if any change.

3. To obtain an electronic copy of the building plan and sections, contact the Engineer. Specify required CAD format when requesting the files.

4. Procedure

   a. As soon as possible after award of Contract, before any material or equipment is purchased, this Contractor shall submit to the Engineer no less than 6 (six) copies for approval. Shop drawings shall be properly identified and shall describe in detail the material and equipment shall be provided, including all dimensional data, performance data, curves, computer selection print-outs, etc.

   b. Corrections or comments made on the submittals do not relieve the contractor from compliance with requirements of the specification. Shop drawing review is only for review of general conformance with the

design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades and performing his work in a safe and satisfactory manner.

c. All related items shall be submitted as a package.

4. Submit data on the following items:
   a. Piping, fittings and couplings.
   b. Flow valves, if any added.
   c. Valves and supervisory devices, if any added.
   d. Sprinkler heads and escutcheon plates.
   e. Supports, hangers and accessories.
   f. Any other significant item valued over $100.00

5. Submit to the Owner's Insurance Underwriter sufficient copies for approval to allow one copy to be incorporated into each Owner's Manual in addition to the required As-Built Plans

1.06 HYDRAULIC DESIGN DATA

A. Water Density and Square Foot Requirements: Provide per NFPA.

B. Codes and Requirements:

1. Comply with the standards of most recent edition of the National Fire Protection Association.

2. Comply with the BOCA International Building Code, all Maine State laws as well as local codes and ordinances.

3. Comply with the requirements of the State Fire Marshals Office, Local Fire Chief, Owners Insurance Underwriter, Local Water District and other Authorities Having Jurisdiction

1.07 GUARANTEE

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

1.08 MAINTENANCE MANUAL

On completion of this portion of the work, and as a condition of its acceptance, submit for review two copies of a manual describing the system. Prepare manuals in durable 3-ring binders approximately 8.1/2" by 11" in size with at least the following:

A. Project name on the spine and front cover, and identification on the front cover stating the project name, general nature of the manual, and name, address and telephone number of the General and Sprinkler Contractors.

B. Neatly typewritten index.

C. Complete instructions regarding operation and maintenance of all equipment involved.

D. Complete nomenclature of all frequently replaceable parts and supplies, their part numbers, and name, address and telephone number of the vendor.

E. Copy of all guarantees and warranties issued, and dates of expiration.

F. Shop drawings and equipment/fixtures manufacturer’s catalog pages.

PART 2 – PRODUCTS

All products shall be new and must be either Factory Mutual (FM) or Underwriters' Laboratory (U.L.) listed or both.

2.02 MATERIALS

A. Piping:

1. Match existing.

B. Sprinkler Heads:

1. Match existing

C. Hangers: Match existing. . Provide seismic protection unless specifically exempt by the Authority Having Jurisdiction. Hang from building structure, not piping of other trades.

E. Sleeves:

1. Fire caulk all penetrations through floors and fire rated partitions.

F. Valves:

1. Match existing.

G. Provide all miscellaneous items required for a complete system, such as: paint, signs, valve tags, pipe markers, chains and locks, relief valves, and water additives. Match existing whenever possible.

PART 3 – EXECUTION

3.01 PREBID EXAMINATION AND INVESTIGATION

A. Visit the site and become acquainted with the conditions.

B. Study all Drawings and Specifications for all related and interfacing trades. No claim will be recognized for extra compensation due to failure to become familiarized with the conditions and extent of the proposed work as indicated within.

C. Ascertain all Authorities Having Jurisdiction, and consult where needed.

3.02 OBTAINING DRAWINGS AND SPECIFICATIONS

A. Obtain a FULL set of drawings and specifications as soon as is practical.

3.03 SPECIFIC INSTALLATION REQUIREMENTS

A. All piping in finished areas shall be run concealed wherever possible.

B. For aesthetic reasons, locate sprinkler heads neatly and symmetrically, relative to the walls, ceiling grid, diffusers and light fixtures. Line-up heads whenever possible. Locate heads in tiles in suspended ceilings, such that they are: centered whenever possible or at quarter points when so required.

C. All sprinkler work shall avoid proposed locations of, and installation clearances for, lighting, ducts, piping, framing and equipment.

3.04 COORDINATION

A. Coordinate sprinkler work with that of other trades of these floor and any other interfacing floors. Coordinate early for locations of large piping. Ductwork, mechanical equipment, electrical panels and large gravity piping will be given priority over sprinkler piping, unless all effected parties agree otherwise. No compensation will be given for neglect to comply with the above and no claim will be recognized for sprinkler piping, heads and miscellaneous appurtenances which must be modified, removed and reinstalled or relocated, due to conflicts with other work which is or will be installed per the Contract Documents.

B. If any electrical work is required, contact the Electrical Contractor and assure that all requirements for power and fire alarm system have been met.

3.05 TESTS

A. The entire installation shall be tested with water in accordance with all NFPA requirements, all requirements of the local Fire Department and local Water District; and the Owner’s Insurance Underwriter; this includes the testing of all alarms.

END OF SECTION 21000

SECTION 210000
PLUMBING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings, Addenda, General Provisions of Contract, including General and Supplementary conditions and General Requirements apply to work specified in this Section.

1.02 DEFINITIONS

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

B. Adaptable: Designed so in the future it can be easily adapted to meet most of the essential requirements of the Americans with Disabilities Act with minor additions and adjustments, such as change of height of counter or addition of a lift seat.

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

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

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

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

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

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

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

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

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

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

1.03 ALTERNATES

There are NO alternates that apply to this section of the project.

1.04 DESCRIPTION OF WORK

A. Work Included

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

2. Provide the following:

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

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

1.05 PERMITS

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

B. The Contractor shall frame under glass/ clear plastic all permits, secured by him, adjacent to the respective system and/or equipment and required to be displayed by Code, law or ordinance. Those permits secured but not required to be displayed shall be laminated in plastic and included in the Owner's maintenance manual.

1.06 CODES AND ORDINANCES

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

ADA	Americans With Disabilities Act
ANSI	American National Standards Institute

ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASTM	American Society for Testing and Materials
BOCA	Building Officials & Code Administrators International, Inc.
NFPA	National Fire Protection Association (a.k.a. NFC, National Fire code)
NEMA	National Electrical Manufacturer's Association
OSHA	Occupational Safety and Health Act
UL	Underwriter's Laboratories

B. If an obsolete code section or standard is specified, the latest replacement issue of each Code or standard for the application, in effect at the time of bidding, shall be used. Code requirements are the minimum quality and/or performance acceptable. Where the Specifications and/or Drawings indicate more stringent requirements, these requirements shall govern.

1.07 QUALITY ASSURANCE

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

B. Technical training of workmen installing the systems specified, by the systems manufacturer, shall be mandatory prior to commencement of work. Documentation of such certification shall be made available to the Architect upon request within 5 business days

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

1.08 ELECTRONIC DRAWINGS AND FILE SHARING

Plans and specifications may be made available in electronic format on request. Plans may be provided in either Adobe (.pdf) or CAD (.dwg or .dxf) formats and will be compressed using WinZip (.zip format). Recipient is responsible to obtain the necessary software to open the files. Note: CAD drawings will be made available to successful bidders only after a contract is awarded.

CAD drawings are produced with AutoCAD 2006 and may be provided in either the 2000 or 2004 file formats. Upon request for CAD files a release form will be provided which must be signed and returned to the Engineer prior to transmission of electronic files. Physical mailing address, telephone numbers and e-mail address for this office are indicated on each drawing. A signed release will not be required for Adobe based files.

All contract documents are copyrighted material. No portion of materials may be reproduced or duplicated except as indicated in the release form. Where release forms are not required (Adobe based files), materials may be printed for use by the intended recipient only and may not be reproduced or copied in any other manner unless written permission is obtained.

1.09 MATERIALS AND SUBSTITUTIONS

All materials and equipment shall be new and of the latest design of respective manufacturers. All materials and equipment of the same classification shall be the product of the same manufacturer, unless specified otherwise.

A. Any proposal for substitution of Plumbing equipment shall be made in writing PRIOR TO OPENING OF BIDS. Submit full details for consideration and obtain written approval of the Architect. The phrase "or approved equal" shall be intended to mean that the Architect, not the contractor, shall make final determination whether or not substitute materials are an equal to that which is specified. The contractor shall be responsible to certify within his submittals that any equipment to be considered as an "approved equal" meets or exceeds the requirements of this specification in all aspects and will physically fit within the space provided and still provide adequate space adjacent to the equipment for service. If requested by the Architect the contractor shall provide said certification in the form of scale drawings before review will be made. Architect will not be responsible to provide drawings for substituted materials unless the substitution is agreed upon prior to opening of bids. Architect's decision on acceptability of substitute materials shall be final.

B. Approval by Architect for such substitution shall not relieve the Plumbing Contractor from responsibility for a satisfactory installation and shall not affect his guarantee covering all parts of work

C. Any material or equipment submitted for approval which are arranged differently or is/are of different physical size from that shown or specified shall be accompanied by shop drawings indicating different arrangements of size and method of making the various connections to equipment. Final results will be compatible with system as designed.

D. Materials and equipment determined as an “approved equal” and /or substitutions must meet the same construction standards, capacities, code compliances, etc. as the equipment (i.e. manufacturer, model, etc.) specified.

E. Any additional cost resulting from the substitution of equipment shall be paid by this Contractor.

1.10 PLANS AND SPECIFICATIONS FOR SUPPLIERS

This Contractor shall provide his Suppliers, and any related subcontractors, with a copy of the specification pages, and letter sized photocopies of equipment details and schedules, that pertain to the item to be supplied.

1.11 SHOP DRAWINGS & SUBMITTALS

A. As soon as possible after award of Contract (but not longer than 21 calendar days), before any material or equipment is purchased, Plumbing Contractor shall submit to the Architect no less than ten (10) copies of shop drawings for approval. If shop drawings are not submitted within the allotted time frame all substitutions included the late shop drawings will be invalid and the equipment specified must be provided. Any costs resulting from delays in the project schedule due to failure to submit shop drawings

related to this section in a timely manner shall be the responsibility of the Plumbing Contractor.

B. Each item shall be properly identified, preferably by fixture/equipment tag number (such as WC-3), and shall describe in detail the material and equipment to be provided, including all dimensional data, performance data, pump curves, computer selection print-outs, etc. Capacities indicated are minimums. Equipment submitted with capacities below specified parameters will be refused.

C. Corrections or comments made on the shop drawings do not relieve the contractor from compliance with requirements of the drawings and specifications. Shop drawing review is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades and performing his work in a safe and satisfactory manner.

D. Should any materials or products be purchased and/or installed without prior review and comment the contractor shall be required to remove or replace those products and/or materials if directed by the Architect at his own expense. If the materials are not removed (or replaced) or if the project is delayed as a result the Architect reserves the right to order the withholding of payment until the situation is resolved in a manner satisfactory to the Architect.

E. Shop drawings for sections 15400, 15600 and 15710 shall be submitted under separate cover or they will be refused for re-submittal. In order to maintain consistency, submittals shall be identified by job title, specification section and paragraph number. Electronic files shall be identified in the same manner (Leonardlake-15400-2.01-E.pdf for instance). Items under each paragraph may be combined into one submittal but do not combine items from multiple paragraphs. For instance, do not combine items specified under par 2.01 with items specified under par. 2.02.

F. It is desirable for shop drawings to be submitted electronically, including all documentation outlined in paragraph “A” above. Hard copies of shop drawings must be original documents or good quality photocopies of original documents (photocopies of color samples are not acceptable). Faxed copies of submittal sheets will be refused.

G. Review must be obtained on all items specified in Section 2 Products or shown on the drawing, and any significant items implied or otherwise required but not specified.

H. Format

1. Related items shall be stapled or Bound together as a package. The number of copies of each package shall be as listed above. Examples of packages of related items include:

    a. Hangers and Supports
    b. Identification
    c. Insulation
    d. Valves
    e. Piping

f. Plumbing Fixtures with accessories
g. Drainage Specialties
h. Water Specialties

2. If due to circumstances beyond his control, the contractor is unable to include all the related items in the submitted package, he shall insert in its place a plain sheet of paper with a notation stating that the item will be submitted separately.

1.12 PRODUCT HANDLING

Use all means necessary to protect materials before, during and after installation, and to protect the installed work and materials of all other trades. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

1.13 AS-BUILT DRAWINGS

Keep in good condition at the job, apart from all other prints used in actual construction, one complete set of all blueprints furnished for this job. On this special set of blueprints, record *completely and accurately* all differences between the work as actually installed and the design as shown on the drawings. These record prints must be kept up to date by recording all changes within one week of the time that the changes are authorized. At the completion of the work, this set of drawings shall be delivered to the Architect for the Owner electronically in the form of CAD drawings. If a complete record of changes is not made and electronic CAD drawings not provided by the Plumbing Contractor, a record shall be made by the Engineers, and *the cost of the record shall be paid by the Plumbing Contractor*. Copies of the plumbing CAD drawings may be made available electronically to the Contractor if desired. Drawings shall be dated accordingly and clearly identified as "AS-BUILT". Contact the Architect directly or the Engineer via e-mail at mechsyst@maine.rr.com. Specify required CAD format when requesting the files. CAD drawings were generated using AutoCAD 2006 and utilize both paper space and model space with external references to various other drawings. Files will be compressed and will require "WinZip" (http://www.winzip.com) for extraction. A release form will be provided which must be signed and returned to the Engineer prior to transfer of files.

1.14 MAINTENANCE MANUAL

On completion of this portion of the work, and as a condition of its acceptance, submit for review two copies of a manual describing the system. Plumbing equipment manuals shall be separate from mechanical manuals. All manuals shall be original copies, not photocopies, or they will be refused for resubmittal. Prepare manuals in durable 3-ring binders approximately 8.1/2" by 11" in size with at least the following:

A. Project name on the spine and front cover, and identification on the front cover stating the project name, general nature of the manual, and name, address and telephone number of the General and Plumbing Contractors.

B. Neatly typewritten index.

C. Complete instructions regarding operation and maintenance of all equipment involved.

D. Complete nomenclature of all frequently replaceable parts and supplies, their part

numbers, and name, address and telephone number of the vendor.

E. Copy of all guarantees and warranties issued, and dates of expiration.

F. Shop drawings and equipment/fixtures manufacturer's catalog pages. Clearly indicate the precise item included in this installation and delete, cross out or otherwise clearly indicate, all manufacturers' data with which this installation is not concerned.

1.15 OBJECTIONABLE NOISE AND VIBRATION

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

1.16 GUARANTEE

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

1.17 DEVIATIONS, DISCREPANCIES AND OMISSIONS

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

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

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

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

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

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

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

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

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

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

1.18 WORKPLACE SAFETY

A. The Trade Contractor alone shall be responsible for the safety, efficiency and adequacy of his plant, appliances and methods, and for any damage, which may result from their failure of their improper construction, maintenance, or operation.

1.19 CHANGE ORDERS

A. No change shall be made from the work, equipment, or materials under this section except as directed in writing by the Architect or Engineer of record.

B. All requests for change in contract price and scope shall be accompanied by a breakdown list of materials with unit and extended prices and labor hours with unit and extended price, plus markups that have been applied.

PART 2 - PRODUCTS

2.01 GENERAL

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

B. All materials and equipment of the same classification shall be the product of the same manufacturer, unless specified otherwise. An entire product line may be rejected if one, or more, of the products submitted is not an equal to that specified.

C. All products shall be manufactured within the United States, unless specified otherwise, and supplied locally (within the State) wherever possible. It is preferable to obtain materials that are manufactured within 500 miles of the work site when practical.

D. Unspecified items shall be by the same manufacturer and level of quality and as similar items specified, whenever possible. Whenever items have no similarity to those specified in this section, provide the equivalent item as specified in other Division 15 Sections. When no similarity exists in other sections, the Contractor shall submit for review an appropriate commercial/institutional quality item, complete to perform the functions intended, using his best discretion. The Architect or a designated Consultant, not the contractor, shall make final determination whether materials are of suitable quality and perform the functions intended.

2.02 HANGERS AND SUPPORTS

A. General

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

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

3. All steel hangers shall be factory painted.

4. Hangers shall be heavy-duty steel adjustable clevis type, plain for steel, cast iron and plastic pipe, and copper plated for piping in direct contact with copper tubing (i.e. copper hot water piping) shall be equal to Carpenter & Paterson Inc., Fig. 100 (Fig. 100CT copper plated).

5. Hangers shall go outside of insulation for domestic water piping. Each hanger shall be furnished with metal shield; Fig. 100 SH.

6. Exposed vertical risers ¾ inch and smaller shall be supported at 6 foot intervals between floor and ceiling with split ring type hangers; copper plated for piping in direct contact with copper tubing equal to Carpenter & Paterson Inc., Fig.81 (Fig. 81CT copper plated). ALL PIPING DROPS TO FIXTURES SHALL BE ANCHORED SOLID TO WALL WITH A STEEL SUPPORT BRACKET WITH ADJUSTABLE CLIP, ESPECIALLY PIPING TO FLUSH VALVES

7. Piping suspended from walls and partitions shall be supported by steel support bracket with adjustable clips equal to Carpenter & Paterson Inc., Fig. 69. All attachments to bar joists shall be from top chord.

B. Hanger Rods & Attachments

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

Pipe Size	Rod Size
3/8” to 2”	3/8”
2.1/2” to 3.1/2”	1/2"
4” to 5”	5/8”
6”	3/4"

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

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

4. Provide toggle bolts with rod couplings for fastening in the pre-cast concrete plank decks.

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

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

2.03 SEISMIC RESTRAINT

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

A. Piping Suspended by Hangers

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

1. Fuel Oil, Fuel Gas, 1 inch and larger

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

B. Piping Risers

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

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

C. Equipment

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

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

2.04 IDENTIFICATION

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

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

Legend	Background/Letter Color
"Cold Water"	Green/ white letters
"Domestic 120^{o}F Water"	Yellow/ black letters
"Domestic 120^{o}F Return"	Yellow/ black letters
"Domestic 140^{o}F Water"	Yellow/ black letters
"Plumbing Vent"	Green/ white letters
"Sanitary Drain"	Green/ white letters

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

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

2.05 INSULATION

A. All Domestic Water Piping, Storm Water Piping and Radon Vent Piping in Unheated Areas

1. Exposed Piping: Insulate exposed piping above slab/grade with Owens Corning Evolution SSL II paper free ASJ with tough, wrinkle resistant, easy to-clean

jacket, or approved equal. Install will great care for appearance, turning any writing or seams toward the wall. Or reviewed equal.

a. Option: use standard Owens Corning fiberglass insulation with ASJ or approved equal, and carefully and neatly cover it with a white PVC plastic covering material. Covering shall be applied in no less than 4 foot lengths with shingle joints. Longitudinal joints shall be on the top or back sides so as to be out of sight and sealed with adhesive materials provided with the jacketing. Material shall be butted to finish walls or Insulation. Jacketing material shall be Zeston pre-cut, pre-curled 0.030 thickness. Or reviewed equal.

2. Concealed piping and piping in Mechanical rooms: Insulate with well installed and sealed Armaflex Pipe Insulation with pressure sealing lap adhesive, or equal.

a. Option: use standard Owens Corning fiberglass insulation with ASJ or approved equal.

3. Thickness as follows:
   a. Hot water mains, recirculated hot water branches and recirculation returns: 1 inch thick minimum.
   b. Unrecirculated hot water branches: 1" thick.
   c. Cold water piping: ½" thick minimum.

4. Insulate any below grade hot water piping run outs with ½" Armaflex closed cell piping insulation.

B. Fittings

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

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

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

C. Installation

All insulation work shall be executed by skilled insulation workmen regularly in the trade.

2.06 VALVES

A. General

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

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

while open.

3. Check valves shall be installed in all lines where flow may reverse from intended direction.

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

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

B. Types and Manufacturers

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

1. Globe Valves 2 inches in size and smaller

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

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

2. Angle valves

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

3. Ball valves 1¼ inches in size and smaller

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

	Soldered Ends	Screwed Ends
Milwaukee	BA-350S	BA-300S
Apollo	82-200	82-100
Watts	B-6081	B-6080
NIBCO	------	------
Hammond	8614	8604

4. Ball valves 1½ inches in size and larger

Shall have bronze bodies, Type 316 stainless steel stems and balls, reinforced Teflon seats and seals, blowout proof stems and adjustable stem gland. Shall be equipped with suitable packing for service intended. Ports shall be "conventional

port". Rated for 400# WOG and 350°F:

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

5. Check Valves 2 inches in size and smaller

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

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

6. Balancing Valves (BV)

Shall be Globe valve as specified above. Initially set full open, then close incrementally until the desired flow is achieved.

2.07 DOMESTIC WATER PIPING

A. Interior Exposed, High temperature and Supportive

1. All exposed piping carrying domestic water, all piping with a temperature above 140 deg. F., all piping supporting inline equipment, and piping within 6 ft of the water heaters, shall be hard-drawn type "L" copper tube with cast or wrought fittings and made up with Silvabrite 100 lead-free solder. Care shall be taken not to over flux.

C. Interior Concealed

All concealed hot (below 141) and cold water piping above finish floor (not buried) shall be one of the following:

1. Type L Copper and fittings, all sizes

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

4. All buried water and trap primer piping shall be AquaPEX or type "K" soft copper tubing. No joints below slab.

5. All buried hot water piping shall be insulated and sealed with ½" Armaflex. **Do not direct bury copper hot water piping.**

6. All exposed, uninsulated water piping near fixtures in finished areas shall be chromium plated I.P.S. copper or red brass pipe or tubing and fittings. Valves shall also be chrome plated brass or bronze. Any chrome trim with wrench

marks shall be removed and new trim installed.

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

2.08 PIPE EXPANSION FITTINGS AND LOOPS

Provide expansion loops on hot water supply (120 degrees and above) and recirculating return lines where shown and on any straight pipe lengths over 100 feet that occur as a result of relocating piping to meet field conditions. Loop shall be 2 feet long by 4 feet offset, and located near center of length. Anchors shall be bolted collars held by angular braces in direction of piping near opposite ends of the pipe. Provide guides on each expansion joint.

2.09 DENTALVACUUM PIPING

A. PVC Piping: ASTM D1785-06, Type 1 (normal impact), Grade 1 (chemical resistance), Schedule 80 solid wall pipe. Provide socket ASTM D2566 fittings and ASTM D2564 PVC solvent cement with PVC primer recommended by manufacturer. Use long radius fittings for turns and wye fittings for branching.

B. PVC Body double-seal ball valves with replaceable neoprene or TFE seat seals. Provide valves suitable for at least 690 kPa (100 psig), cold water, non-shock working pressure. Design especially for vacuum service. Operating parts of valve shall be removable without removing from line.

2.10 DENTAL COMPRESSED AIR PIPING

A. Copper medical gas tube shall be type K or L, seamless, drawn temper meeting ASTM B819 that has been cleaned, purged, and sealed for medical gas service by the pipe manufacturer. Standard color markings “ACR/MED” shall be in green for Type K and in blue for type L tubing.

B. Wrought copper fittings shall be solder joint, dimensions for brazed joints complying with ASME B16.22.

C. Brazing filler Metals shall be BCuP series, copper-phosphorus allows for general duty brazing conforming to AWS A5.8. C. Screw Joints shall be made with Degreased polytetrafluoroethylene (teflon) tape.

D. Piping identification labels shall be applied in accordance with NFPA 99. Supplementary color identification shall be in accordance with CGA pamphlet C-9.

E. Temperature and pressure ratings of Memory metal couplings shall be not less than that of a brazed joint shall be permitted. The memory metal couplings shall be made of ASTM F 2063, nickel titanium, shape memory alloy, cleaned, purged, and sealed for medical gas service.

F. Valves shall be cleaned purged, and bagged according to CGA G-4.1 for oxygen service.

1. Ball valves 100 millimeters or DN100 (4 inches) and smaller shall be full port, chrome plated brass with PTFE or TGFE seats, lever type handle with locking device, blowout proof stem with PTFE or TFE seal and ends manufactured

according to ASTM B 819 with copper tube extensions. The ball valve shall have a pressure rating of 2070 kPa (300 psig).

2. Check valves 80 millimeters or DN80 (3 inches) and smaller shall be spring loaded with ends manufactured according to ASTM B819 with copper tube extensions. The check valve shall have a pressure rating of 2070 kPa (300 psig).

2.11 PIPE SLEEVES AND ESCUTCHEONS

A. Sleeves

1. Contractor shall set sleeves for all piping penetrating walls and floors. Sleeves through masonry shall be steel pipe sleeves two sizes larger than pipe. Piping passing through walls other than masonry shall be provided with # 24 gauge galvanized steel tubes with wired or hemmed edges.

2. Sleeves set in concrete floors shall finish flush with underside, but extend minimum of 1 inch above finish floor. Weld clips to sleeves for support in concrete pre-cast planks of a size that will be covered by concrete topping. Sleeves set in partitions shall finish flush with each side.

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

4. Masonry sleeves shall be Schedule 40 steel pipe.

5. This Contractor has the option to use the Pro-set system on lieu of the above.

B. Exterior Sleeves

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

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

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

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

C. Escutcheons

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

2.12 PLUMBING FIXTURES

A. LV-1 Lavatory, Public, Wall Mounted - ADA

1. Kohler model K-2005 Kingston wall hung lavatory, for concealed arm support, 4" centers, vitreous china, self draining deck, color "white". Or reviewed equal.

2. Zurn model Z81000, commercial brass, single-handle lavatory faucet, 4" centers, ceramic control components, aerator, less drain assembly, chrome, meets ADA. Replace aerator with 0.5 GPM model. Or reviewed equal.

3. McGuire Prowrap P-trap and supply covers, chrome brass grid drain, chrome plated angle supplies, wheel stops, wrought escutcheons. Or reviewed equal.

4. Provide concealed arms carrier as specified under Drainage Specialties.

B. SK-1 Sink, Single Bowl, Exam

1. Elkay LRAD-1720-6-2 single bowl stainless steel sink, 6" deep bowl, 18 gauge, type 302 SS, self-rim, satin finish, sound guard undercoating, 2 hole drilling, rear drain. Or reviewed equal. LK35 Strainer.

2. Zurn model Z812B4-21F Aquaspec commercial wrist blade bar faucet with 5-3/8" gooseneck spout with 1 GPM laminar flow, chrome brass, meets ADA.

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

C. SK-2 Sink, Single Bowl, Work

1. Elkay LR-2222-3 single bowl stainless steel sink, 8" deep bowl, 18 gauge, type 302 SS, self-rim, satin finish, sound guard undercoating, 3 hole drilling. Or reviewed equal. LK35 Strainer.

2. Sloan model EAF-100-P-ISM Optima I.Q. Electronic Hand Washing faucet, integral spout temperature mixer, 1.5 GPM flow aerator with 6V plug-in power adapter. Provide SFP-22 8" trim plate.

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

D. SK-3 Sink, Single Bowl -ADA

1. Elkay LRAD-1720-6-2 single bowl stainless steel sink, 6" deep bowl, 18 gauge, type 302 SS, self-rim, satin finish, sound guard undercoating, 2 hole drilling, rear drain. Or reviewed equal. LK35 Strainer.

2. Zurn model Z812B1-2F Aquaspec commercial lever handle bar faucet with 5-3/8" gooseneck spout with 2.2 GPM flow, chrome brass, meets ADA.

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

E. WC-1 Water Closet, Floor, flushvalve - ADA

1. Kholer model K-4302 Highcrest elongated, 1.6 GPF, white, vitreous china, 1.1/2" top spud, floor mounted, siphon jet action, bolt caps, rim 16.1/2" above finished floor. Or reviewed equal with bowl between 16-1/8" to 16-1/2".

2. Sloan Royal WES-111-YO, dual flush, chrome, quiet exposed flush valve for 1.1/1.6 GPF, wall flange, 1" screwdriver angle check stop, vacuum breaker, spud coupling flange, ADA green handle, sweat solder adapter kit, two adhesive backed wall plates (place one over flush valve). Rough-in flushvalve with handle on open side of fixture. Or reviewed equal, by Zurn.

3. Kohler model K-4731 Stronghold, elongated, heavy duty, solid plastic open front seat with self-sustaining external checks, antimicrobial, and hardware. Or reviewed equal by Church, Beneke or American Standard.

F. WC-2 Water Closet, Floor, right hand flushvalve - ADA

Same as WC-1 except with handle located on right hand side.

2.13 EQUIPMENT OR PLUMBING FIXTURES BY OTHERS

Any equipment and fixtures by other sections will be provided and set in place by those sections. This contractor will connect gas, domestic hot water, waste and vent as required.

2.14 PLUMBING SPECIALTIES, DRAINAGE

A. Carriers

1. Wall hung fixtures including water closets, lavatories, lav-decks and drinking fountains shall be supported with adjustable floor mounted carriers to fit building conditions, piping system, and fixtures specified. Each carrier shall be provided with a wall finishing frame. All carriers shall be secured to the floor with tie down lugs.

2. Carriers shall be as manufactured by Zurn or reviewed equal.

B. Traps

1. Traps of material and design as approved by the State and shall be furnished and installed at all fixtures and appliances. Trap each fixture separately, keeping all trap screws below water line; vent each trap. Make offsets in vent piping with 45-degree angle fittings when possible. Pitch horizontal vents toward waste lines, group vents and take through roof as shown. All traps, at fixtures and appliances shall be provided with accessible clean outs.

C. Cleanouts

Provide cleanouts for soil and waste where shown on the drawings and as required by code.

1. Floor Cleanouts (FCO)

All floor cleanouts in concrete or tile shall be flush with finish floor.

a. Type “1”, Round, for finished areas

Zurn ZN-1400-BP-K, polished nickel bronze top, bronze plug, anchor flange.

b. Type “2”, Round, with carpet marker (if any)

Zurn ZN-1400-BP-CM polished nickel bronze top, bronze plug, anchor flange, and carpet marker.

2. Wall Cleanouts

All wall cleanouts shall be Zurn Z-1445 cleanout tee with threaded plug. Polished nickel bronze cover, Zurn ZANB-1462 or reviewed equal.

3. Flashing

Flash each above grade floor clean out with Chloraloy® 240 thermoplastic elastomeric sheet membrane for concealed waterproofing, or other approved flashing material, extending 24” beyond perimeter of clean out and lock into clamping collar.

2.15 PLUMBING SPECIALTIES, WATER

C. Shock Absorbers (SA)

Shock protection shall be provided where shown on drawings and at all quick closing devices. Devices shall be stainless steel shell, welded expansion bellows surrounded by on-toxic mineral oil or gas, pressurized compression chamber charged and factory sealed, all, in-line design, threaded nipple and PDI reviewed. Sized to meet the conditions.

1. Type “1”, 'A' P.D.I. units

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

2. Type “2”, 'B' P.D.I. units

Zurn Z-1700, #200. Or reviewed equal.

L. Dielectric Unions

Series 3000 as manufactured by Watts or reviewed equal.

2.16 VALVE BOXES, ACCESS DOORS AND PANELS

A. Furnish General Contractor with valve boxes, access doors/ panels for all locations where service access is required behind walls, above sheetrock and masonry ceilings, and below floors for equipment, piping, valves, and specialties furnished under Division 15.

B. Shall be located in closets, storage rooms and/or other non-public areas whenever possible, in a workmanlike manner, positioned so that junction can be easily reached and the size shall be sufficient for this purpose . When required in corridors, lobbies or other habitable areas, they shall be located as directed by the Architect.

C. Units shall have 16-gauge steel frame and 14-gauge steel hinged door panel. Door shall have concealed spring hinges allowing door to be opened to 175^{o}.

D. Units shall be factory primed for field painting by Section 09900.

E. Provide UL-rated 1-1/2 hour Class B access panels where required to comply with applicable Code requirements.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection

1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

2. Verify that plumbing may be installed in strict accordance with all pertinent codes and regulations and the reviewed Shop Drawings.

B. Discrepancies

1. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until such discrepancies have been fully resolved.

3.02 COORDINATION WITH OTHER TRADES

A. Before installation, participate in a coordination meeting with the Clerk of the Works, Construction Manager, Mechanical/HVAC, Fire Protection and Electrical trades. Establish and resolve areas of conflict and congestion, especially those indicated on the drawings. Priority to be given to HVAC equipment and large ductwork, then gravity piping, then small ductwork, then piping based on descending order of size. Special consideration given to allow access to valves, dampers etc.

B. Failure to coordinate will result in this contractor removing and relocating his piping at no additional expense to the owner.

3.03 INSTALLATION OF PIPING AND EQUIPMENT

A. General

1. Install all piping promptly, making pipe generally level and plumb, free from traps, and in a manner to conserve space for other work.

2. Provide uniform pitch of at least ¼ inch per foot for all horizontal waste and soil piping 3” or less. For piping 4” and above, slope at 1/8” minimum per foot

3. Inspect each piece of pipe, tubing, fittings, and equipment for defects and obstructions; promptly remove all defective material from the jobs 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.

5. Allow room between all piping and other obstructions to allow for the installation of the specified pipe insulation.

6. Plumbing vents

   a. Back vent all plumbing fixtures.
   b. Pitch all vents at 1/64” per foot minimum toward waste lines for proper drainage to prevent unintended traps.
   c. Install vent piping with each bend 45 degrees minimum from the horizontal, wherever structural conditions will permit.
   d. Group plumbing vents and take through roof as shown.
   e. Increase vents 3” and smaller one size before going thru roof. Make size transition a minimum of 12” below the surface of flat roofs and 72” (or as structure permits) below sloped roofs.
   f. Terminate 18” to 24” above roof.
   g. If installing in locations other than as shown on the drawings, line up with other plumbing vents for a neat appearance.
   h. Do not install plumbing vents within 10 feet of an operable window or door or within 25 feet of a ventilation air intake.

6. All risers and off-sets shall be substantially supported.

7. Pipe hangers shall be placed on center as follows:

MATERIAL	HORIZONTAL	VERTICAL
Copper 1-1/4" & less	6'	6'
1-1/2"	6'	10'
2" & up	10’	10'
PVC, DWV	4’	4'
Steel	10’	10'

8. Arrange all piping to maintain required grade and pitch to lines to prevent vibration. Expansion loops to anchors shall be provided where shown on drawings.

9. Make all changes in pipe size with reducing fittings.

10. All low points in water piping shall be drained with ½” gate valve with hose nipple and metal cap.

11. No piping shall be installed in such a manner to permit back-siphonage or flow of any liquid in water piping under any conditions.

12. No water piping shall be installed outside of building or in an exterior wall unless adequate provisions are made to protect such pipe from freezing.

13. All piping and drain openings left unattended will be capped, plugged or securely covered to prevent accidental entry of foreign matter. Roof drains in use will be provided with domes.

B. Joints and Connections

1. Smoothly ream all cut pipe; cut all threads straight and true; apply best quality

Teflon tape to all male pipe threads but not to inside the fittings; use graphite on all clean out plugs. DO NOT use Teflon tape on gas piping.

2. Smoothly ream all cut P.V.C. pipe. Clean and use solvent for fitting connection and in strict accordance with the manufacturer's recommendations.

3. Make all joints in copper water tube with solder applied in strict accordance with the manufacturer's recommendations.

3.04 STERILIZATION AND FLUSHING OF PIPES

A. After preliminary purging of the system, chlorinate the new potable water system in accordance with the current recommendations of the American Water Works Association, and in accordance with all pertinent codes and regulations. Chlorinate only when the building is unoccupied.

B. Upon completion of the sterilization, thoroughly flush the entire potable water system.

C. After sterilization and flushing are complete, a sample shall be collected from the end of the longest main, or at any other location selected by the Architect, and a water analysis test provided. The test must prove the water acceptable or additional disinfecting of system performed. A copy of the test report shall be submitted to the Architect.

3.05 CLOSING IN UNINSPECTED WORK

Do not cover up or enclose work until it has been properly and completely inspected and approved. 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 completely inspected and approved, make all repairs and replacements with such materials as are necessary to the approval of the Architect and at no additional cost to the Owner.

3.06 TESTING OF PIPING

Tests shall be applied to the plumbing installation as required by codes and where as directed by the Architect, and in all cases before work is covered by earth fill or pipe covering.

A. Sanitary piping shall be tested when all underground work is complete (before covering) and again, after all piping is installed, but before it is further closed in. Sanitary systems shall be securely stopped, except at the highest point, and the entire system filled with water to the point of overflow for 24 hours. All leaks shall be repaired. Cracked pipes and fitting shall be removed and replaced. No doping of soil pipe or fittings will be allowed. Plan testing around expected weather and temperature conditions or provide protection so that pipes do not freeze.

B. New domestic water piping shall be filled and subjected to a hydrostatic pressure test of 150 psi for 8 hours with no leaks. If leaks are detected they shall be repaired and the test repeated until work is tight. NOTE: Testing with compressed air only is NOT ACCEPTABLE.

3.07 BALANCING

Balance the domestic hot water recirculation system. Divide the rated pump flow by the number of return branches so that the expected return flows from each branch are approximately equal. Start with all the balancing valves fully open, then close (and/or reopen) them slightly, starting with the one closest to the pump, then repeat incrementally each until the desired flow is reached in each. This is most quickly accomplished with a man placed at each valve, communicating through walki-talkies.

3.08 CLEANING

Prior to acceptance of the buildings, thoroughly clean all exposed portions of the this installation, removing all labels and all traces of foreign substance, using only a cleaning solution approved by the manufacturer of the plumbing item, being careful to avoid all damage to finished surfaces. Additional attention may be required to thoroughly clean any used, re-used or owner provided fixtures. Clean out all strainers and aerators and adjust or replace washers, cartridges, etc

3.09 INSTRUCTIONS

On completion of the job, this Contractor shall provide a competent technician to thoroughly instruct the Owner's Representative in the care and operation of the system. The time of instruction shall be arranged with the Owner.

3.10 RECYCLING

Discarded materials, both new and removed, shall be recycled whenever practical through metal salvage dealers (piping, etc.), paper salvage (cardboard shipping containers, etc.), wood products, etc. The Plumbing Contractor shall retain the salvage value of discarded materials and may use this value to offset his project bid price if so desired. Toxic materials such as adhesives, coolants, etc. SHALL be disposed of in a manner acceptable to the State of Maine Department of Environmental Protection.

3.11 HAZARDOUS MATERIALS

Mercury or any other material deemed by the Federal Environmental Protection Agency or the State Department of Environmental Protection to be hazardous shall not be used in any components of the plumbing systems.

END OF SECTION

SECTION 23 00 00
MECHANICAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

General Provisions of Contract, including General and Supplementary conditions and General Requirements (if any) apply to work specified in this Section.

1.02 ALTERNATES

There are no alternates that apply to this section of the project.

1.03 DEFINITIONS

ATC Automatic Temperature Control
EC Electrical Contractor (Division 26)
GC General Contractor
HC Heating (mechanical) Contractor
PC Plumbing Contractor

1.04 DESCRIPTION OF WORK

A. Work Included

1. Furnish all labor, materials, equipment, transportation and perform all operations required to install complete heating, ventilating, and exhaust systems in the building areas shown on the drawings, in accordance with these specifications and applicable drawings.

2. All temperatures are expressed in degrees Fahrenheit.

3. Perform demolition and removal as required.

4. Work to be performed shall include, but is not limited to, the following:

a. Provide and install forced hot water heating and ventilating system in building areas indicated on drawings.
b. Provide and install exhaust systems in building areas indicated on drawings.
c. Pipe, valve and fittings
d. Hot water specialties
e. Fan coil units
f. Insulation
g. Fans
h. Sheetmetal
i. Automatic Temperature Control (ATC)
j. Tests and balance

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

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

7. Mechanical contractor shall be responsible for rigging to hoist his own (and his sub-contractors') materials and equipment into place.

8. Mechanical contractor and his sub-contractors shall be responsible for start-up of all equipment provided under this section.

B. Related Work Described Elsewhere

1. Cutting and patching
2. Electrical conduit and wiring, except as noted below
3. Setting of sleeves in masonry work (sleeves provided by Mechanical Contractor)
4. All finish work

C. Mechanical Electrical Work

1. Provide and erect all motors, temperature controls, limit switches as specified.

2. Power supply to switches, fused switches, outlets, line terminals of equipment, and all related wiring and fuses to properly connect and operate all electrical equipment specified shall be furnished and installed under Division 26, "ELECTRICAL". Division 26 shall not drill wiring holes in equipment casings but shall make use of factory wiring knockouts when present. Coordinate all wiring between Mechanical and Electrical to provide a complete and operating system.

3. All wiring provided under this section shall be in accordance with the latest rules and regulations of the National Fire Underwriters, National Electric code and Local Codes. Install all wiring under the supervision of Division 26. Any wiring that is not installed according to these standards, and which does not match wiring installed by Division 26 in type, quality and appearance shall be corrected by Division 26 at the expense of this section.

4. Automatic Temperature Control (ATC) Systems

   Electric wiring shall be furnished and installed by ATC Contractor under supervision of Division 26. Any wiring that is not installed according to these standards, and which does not match wiring installed by Division 26 in type, quality and appearance shall be corrected by Division 26 at the expense of this section.

Division 26 shall provide a 15 amp dedicated circuit (if not already existing) for control power.

Low voltage control wiring must be plenum rated and adequately supported with no sags or “droops”. Low voltage wiring need not be installed in conduit unless required by local code.

5. Fans

   a. Single phase 120 volt units: Division 26 to wire to unit mounted disconnect switch with overload protection provided with unit.
   b. Fans shall operate by controlled by the ATC and operate as indicated in "Automatic Temperature Control" section of this specification.
   c. Division 26 to provide 120 volt power from exhaust fans to motor operated dampers associated with each fan. Dampers and actuators to be provided by ATC Contractor.

6. Fan Coil Units

   Division 26 shall wire to disconnect switch provided with each unit.

1.05 PERMITS

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

B. The Contractor shall prominently display all permits secured by him as required by Code, law or ordinance. Those permits secured but not required to be displayed shall be included in the Owner’s maintenance manual.

1.06 CODES, ORDINANCES AND PERMITS

A. All work performed under this Section of the Specifications shall be done in accordance with applicable National, State and local Codes, Laws and Ordinances. The following abbreviations are used for reference to standards which are to be followed:

AABC	Associated Air Balance Council
ADA	Americans With Disabilities Act
AMCA	Air Movement & Control Association
ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BOCA	Building Officials and Code Administrators
NEC	National Electrical Code
NFPA	National Fire Protection Association
NEMA	National Electrical Manufacturer's Association

OSHA	Occupational Safety and Health Act
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
UL	Underwriter's Laboratories

B. The latest issue of each Code in effect at the time of bidding shall be used. Code requirements are the minimum quality and/or performance acceptable. Where the Specifications and/or Drawings indicate more stringent requirements, these requirements shall govern.

1.07 QUALITY ASSURANCE

A. Mechanical Contractor shall have prior experience with at least two projects of this nature, size and scope and be capable of producing references indicating as such.

B. Use sufficient qualified workpersons and competent supervisors in execution of this portion of the work to ensure proper and adequate installation of systems throughout. Technical training and certification of workpersons installing the systems specified, by the systems manufacturer, shall be mandatory prior to commencement of work. Documentation of such certification shall be made available to the Architect upon request within 5 business days.

C. Work performed shall conform with all Local and State Rules and Regulations, as well as those of the International Building Code and National Fire Protection Association (N.F.P.A.).

D. Piping design shall conform to ANSI, ASME B31.9 and AWS D10.9 codes.

1.08 PLANS AND SPECIFICATIONS

Mechanical Contractor shall provide his sub-contractors with a copy of the entire portion of Part 1 of this specification, portions of this specification and copies of drawings which pertain to the equipment to be supplied at no cost to the sub-contractor. Provide ATC Contractor with entire set of Electrical plans and specifications. Provide Testing and Balancing sub-contractor with copies of shop drawings indicating coil gpm’s, air handling unit air volumes, etc. Failure to do so may result in the Architect providing the required materials at the Contractor’s expense.

Sketches pertaining to changes and amendments during construction (ASI’s, RFI’s and RFP’s for example) shall be contract form documents issued by the Architect and/or Engineer for use during construction and it shall be the Architect’s and/or Engineer’s discretion to provide sketches or full size drawings. Requests for documentation other than what is provided (full size revised drawings for instance) and deemed suitable for the particular situation shall be paid for by the contractor making the request. The cost(s) shall include, but not limited to, drafting time and reproduction costs.

1.09 ELECTRONIC DRAWINGS AND FILE SHARING

Plans and specifications may be made available in electronic format on request. Plans may be provided in either Adobe (.pdf) or CAD (.dwg or .dxf) formats and will be compressed using WinZip (.zip format). Recipient is responsible to obtain the necessary software to open the files. Note: CAD (.dwg and .dxf) files will be made available to successful bidders only after a contract is awarded.

CAD drawings are produced with AutoCAD and may be provided in the 2004 or 2010 file format. Upon request for CAD files a release form will be provided which must be signed and returned to the Engineer prior to transmission of electronic files. Physical mailing address, telephone numbers and e-mail address for this office are indicated on each drawing. A signed release will not be required for Adobe based files.

All contract documents are copyrighted material. No portion of materials may be reproduced or duplicated except as indicated in the release form. Where release forms are not required (Adobe based files), materials may be printed for use by the intended recipient only and may not be reproduced or copied in any other manner or for any purpose other than for use pertaining to the construction of this project unless written permission is obtained.

1.10 MATERIALS AND SUBSTITUTIONS

All materials and equipment shall be new and of the latest design of respective manufacturers. **All materials and equipment of the same classification shall be the product of the same manufacturer**, unless specified otherwise.

A. Any proposal for substitution of Mechanical equipment, materials or vendors shall be made in writing up to four days prior to opening of bids to permit sufficient time to notify all bidders via addenda. Any requests made after the final addenda prior to bid opening will not be considered. Submit full details for consideration and obtain written approval of the Architect. The phrase "or approved equal" shall be defined to mean the Architect, not the contractor, shall make final determination whether or not substitute materials are an equal to that which is specified. The contractor shall be responsible to certify within his submittals that any equipment to be considered as an "approved equal" meets or exceeds the requirements of this specification in all aspects and will physically fit within the space provided and still provide adequate space adjacent to the equipment for service. If requested by the Architect the contractor shall provide said certification in the form of scale drawings before review will be made. Architect will not be responsible to provide drawings for substituted materials unless the substitution is agreed upon prior to opening of bids. Architect's decision on acceptability of substitute materials shall be final.

B. Approval by Architect for such substitution shall not relieve Mechanical Contractor from responsibility for a satisfactory installation and shall not affect his guarantee covering all parts of work

C. Any material or equipment submitted for approval which are arranged differently or is/are of different physical size from that shown or specified shall be accompanied by shop drawings indicating different arrangements of size and method of making the various connections to equipment. Final results will be compatible with system as designed.

D. Materials and equipment determined as an "approved equal" and/or substitutions must meet the same construction standards, capacities, code compliances, etc. as the equipment (i.e. Manufacturer, model, etc.) specified.

E. Any additional cost(s) resulting from the substitution of equipment, regardless of acceptance by the Architect or Engineer, shall be paid by this Contractor. Additional costs may include, but not be limited to, electrical and/or structural alterations from the contract documents. Contractor shall be solely responsible to verify that substitutes will fit within the designated spaces provide while permitting adequate clearances for servicing of equipment as required by the manufacturers and will not interfere with other trades. Contractor shall, upon request from the Architect or Engineer of record, provide such verification of ample space and clearances in the form of drawings or any other manner requested.

F. All materials not specified otherwise shall be manufactured within the United States and supplied locally (within the State of Maine) when available. It is preferable to obtain materials that are manufactured within 500 miles of the work site when practical.

1.11 SHOP DRAWINGS & SUBMITTALS

A. As soon as possible after award of contract (*but not longer than 21 calendar days*), before any material or equipment is purchased, Mechanical Contractor shall submit shop drawings for review. Unless prior arrangements are made with the Architect all shop drawings must be submitted to the General Contractor who in turn will forward them to the Architect. The quantity of copies shall be as outlined in Division 01. If shop drawings are rejected or returned for re-submittal, Mechanical Contractor shall provide said re-submittals within 14 calendar days of receipt of original submittals with engineer's comments. If original or re-submitted shop drawings are not submitted within the allotted time frames indicated all substitutions included in the late shop drawings will, at the Architect's discretion, be invalid and the equipment primarily specified must be provided. Any costs resulting from delays in the project schedule due to failure to submit shop drawings related to this section in a timely manner shall be the responsibility of the Mechanical Contractor. Mechanical Contractor's and vendor's name, address, telephone number and e-mail addresses shall be provided with every shop drawing submission. Capacities indicated are minimums. Equipment submitted with capacities below specified parameters will be refused.

B. Shop drawings shall be properly identified and shall describe in detail the material and equipment to be provided, including all dimensional data, performance data clearly indicated, fan curves, pump curves, computer selection print-outs, etc. Capacities indicated are minimums. Equipment submitted with capacities below specified parameters will be refused.

C. Corrections or comments made on the shop drawings do not relieve the contractor from compliance with requirements of the drawings and specifications. Shop drawing review is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades and performing his work in a safe and satisfactory manner.

D. Should any materials or products be purchased and/or installed without prior review and comment the contractor shall be required to remove or replace those products and/or materials, if directed by the Architect, at his expense. If the materials are not removed (or replaced) or if the project is delayed as a result of the contractor's actions, the Architect reserves the right to order the withholding of payment until the situation is resolved in a manner satisfactory to the Architect.

E. Shop drawings for Divisions 22 and 23 shall be submitted under separate cover or they will be refused for re-submittal. Submittals shall be identified by job title, specification section and paragraph number. Items under each paragraph may be combined into one submittal but do not combine items from multiple paragraphs. For instance, do not combine items specified under par 2.01 with items specified under par. 2.02.

F. Shop drawings are required to be submitted electronically (paper copies will not be accepted). Electronic files must be accessible and in an open format, meaning files must not be locked and comments may be added without altering the original content, or have interactive fields intended specifically for commenting. Locked files will not be reviewed. Exception: Color samples, where required, must be provided to the Architect in the form of original paper copies. Electronic color samples are not acceptable due to differences in monitor color rendition. Faxed copies of color samples will be refused.

G. Review must be obtained on the following items:

1. Ductwork and Accessories

    a. Registers, diffusers, and grilles
    b. Duct access doors
    c. Volume control dampers (manual and automatic)
    d. Duct sealant
    e. Turning vanes
    f. Side takeoff fittings
    g. Flexible duct
    h. Wall caps
    i. Manual dampers
    j. Brick vents - provide color chips (photocopies not acceptable) – provide samples if substituting
    k. Filters

2. Mechanical Equipment (sound data must be provided with all interior motorized equipment).

    a. Full warrantee information must be included with all submittals.
    b. Fan coil units and accessories
    c. Fans and accessories - provide full fan curves and computer selection printouts.
    d. Equipment identification tags

3. Piping and Accessories

   a. Pipe, valves, unions and flanges
   b. Balancing valves with read-out gauge and pressure tappings. Provide a schedule clearly indicating every valve, its location, GPM, size and pressure drop.
   c. Pipe hangers and supports

4. Insulation

   a. Duct
   b. Equipment
   c. Pipe
   d. Pipe fittings

5. Qualifications and Certifications

   Certification(s) of Testing and Balancing Contractor

6. Automatic Temperature Control (ATC) System

1.12 PRODUCT HANDLING

A. Protection

Use all means necessary to protect all materials and equipment before, during and after installation and to protect the installed work and materials of all other trades.

B. Replacements

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

1.13 AS-BUILT DRAWINGS

Keep in good condition at the job, apart from all other prints used in actual construction, one complete set of all blueprints furnished for this job. On this special set of blueprints, record *completely and accurately* all differences between the work as actually installed and the design as shown on the drawings. These record prints must be kept up to date by recording all changes within one week of the time that the changes are authorized. At the completion of the work, this set of drawings shall be delivered to the Architect for the Owner electronically in the form of CAD drawings. If a complete record of changes is not made and electronic CAD drawings not provided by the Mechanical Contractor, a record shall be made by the Engineers, and *the cost of the record shall be the responsibility of the Mechanical Contractor*. Copies of the mechanical CAD drawings (minus professional engineering stamps) may be made available at no cost to the Mechanical Contractor of record if desired. Drawings shall be dated accordingly and clearly identified as “AS-BUILT”. See par. 1.09, “ELECTRONIC DRAWINGS AND FILE SHARING” for additional information.

1.14 MAINTENANCE MANUAL

A. On completion of this portion of the work, and as a condition of its acceptance, submit for approval two copies of a manual describing the system. Mechanical equipment manuals shall be separate from plumbing manuals. All manuals shall be original copies, not photocopies or they will be refused for re-submittal. Prepare manuals in durable 3-ring binders approximately 8½ inches by 11 inches in size with at least the following:

1. Identification on the front cover and spine stating general nature of the manual.
2. Neatly typewritten index.
3. Complete instructions regarding operation and maintenance of all equipment involved.
4. Complete nomenclature of all replaceable parts, their part numbers, current cost, and name, address and telephone number of nearest vendor of parts.
5. Copy of all guarantees and warranties issued.
6. Where contents of manuals including manufacturer's catalog pages, clearly indicate the precise item included in this installation and delete, or otherwise clearly indicate, all manufacturers' data with which this installation is not concerned.

B. In addition to above, provide two (2) separate offset style binders properly identified, each containing a copy of all reviewed shop drawings and catalog cuts. (NOTE: May be incorporated in Maintenance Manuals, if binders are of adequate size.)

1.15 OBJECTIONABLE NOISE AND VIBRATION

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

1.16 GUARANTEE

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

1.17 DEVIATIONS AND DISCREPANCIES

A. The drawings are intended to indicate only diagrammatically the extent, general character and approximate locations of mechanical work. Work indicated, but having minor details obviously omitted, shall be furnished complete to perform the functions intended without additional cost to the Owner. Follow the architectural, structural, plumbing and electrical drawings so that work under this section is properly installed and coordinated with other Sections.

B. The drawings and specifications are complimentary to each other and what is called for in one, shall be as binding as if called for by both. In the event of conflicting information on Division 23 drawings, or between Division 23 drawings and this specification notify the Architect immediately so a clarification may be issued by addenda.

C. Questions to the Architect or Engineers are encouraged, however any answers and/or advice is non-binding unless incorporated into the contract documents in the form of addenda, change order, etc. Inquiries requiring an answer prior to opening of bids should be made at least 4 days prior to when bids are due to allow time for a clarifying addendum to be issued.

D. Any conflicts arising from duplication of equipment specified in different portions of the specifications shall be brought to the attention of the Architect prior to submitting bids. Failure to do so does not relieve the Contractor from responsibility of providing said materials and equipment and a credit will be taken for the duplicated item(s).

E. Should unforeseen job conditions require re-arrangement of piping and/or ductwork resulting in deviation from the intent of the contract documents or potentially compromising the integrity of the mechanical systems, the Architect shall be notified immediately prior to commencement of work. Failure to do so will result in the contractor being responsible to correct any work installed that is contrary to the contract documents at his own expense.

1.18 CHANGE ORDERS

A. No change shall be made from the work, equipment, or materials under this section except as directed in writing by Engineer.

B. All requests for change in contract price and scope shall be accompanied by a breakdown list of materials with unit and extended prices and labor hours with unit and extended price, plus markups that have been applied.

1.19 COORDINATION

A. Contractor shall be responsible to coordinate his work with that of other trades to adjust to field conditions prior to commencing work. It is also this contractor's responsibility to coordinate locations of his own piping and ductwork to ensure the two do not conflict. If a reasonable solution cannot be achieved without compromising the integrity of the intended design or would result in additional cost the Architect must be notified immediately prior to commencement of work. Failure to do so does not relieve the Contractor from providing and installing the systems to the satisfaction of the Architect at no additional cost.

B. Contractor shall be responsible to review job conditions and identify conflicts and/or obstructions to ductwork and piping prior to fabrication. If conflicts and/or obstructions are noted the Architect must be notified immediately prior to commencement of work. The cost of any fabrication work performed without confirmation and notification of conflicts and/or obstructions shall be the responsibility of the contractor.

1.20 REQUESTS FOR INFORMATION

Requests for Information (RFI) or other correspondences which are submitted electronically must be in an open format, meaning files must not be locked and comments may be added without altering the original content, or have interactive fields intended specifically for commenting. Locked files will not be accepted.

Requests for design criteria of the mechanical systems must be submitted in the form of an RFI and shall include the purpose for the request.

1.21 WORKPLACE SAFETY

Mechanical contractor shall be responsible for the safety of his workpeople.

PART 2 - PRODUCTS

2.01 PIPING

A. General

Provide and erect in accordance with best practice of trade all hot water supply and return, chilled water supply and return, low pressure steam, condensate return, pump discharge, drain and vent piping shown on the plans and as required to complete intended installation. Contractor shall make offsets as shown or required to place all piping in proper position to avoid other work, and to allow application of insulation and finish painting.

B. Pipe Materials:

1.	Heating hot water	Schedule 40 standard weight black steel, ASTM 120

C. Pipe Fittings:

1.	Screwed	125# cast iron screwed pattern ASTM A126, ASA B16.1
2.	Unions	250 malleable iron, brass to iron seats
3.	Sweat	Cast bronze or wrought copper made up with 95-5 solder
4.	Connections to equipment	Unions
5.	Dielectric fitting	Steel or copper pipe to ASTM A-53, zinc electroplated body with non-corrosive thermoplastic lining, thread connections. Victaulic Style 47-TT or approved equal.

D. Steel piping shall have screwed connections. All threads on piping must be full length and clean-cut with inside edges reamed smooth to the full inside bore.

E. The Mechanical Contractor may, at his option, use type "L" hard drawn copper tube in lieu of steel. His option of steel or copper MUST be stipulated in his bid and thereafter no deviation will be acceptable. If copper is to be used, the piping system shall be 100% copper with no mixture from copper to steel. New piping which is to be connected to existing shall be schedule 40 steel.

F. Use dielectric fittings when connecting dissimilar metals.

2.02 PIPE INTERIOR HANGERS AND SUPPORTS

A. General

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

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

3. Hangers shall be sized for the piping only (not including insulation).

   Hangers shall be steel, band type; plain for steel pipe and copper plated for copper tubing. Carpenter & Paterson, Inc., Fig. 1A (Fig. 1A CT copper plated) or approved equal.

4. Attachments to wide flange steel members shall be adjustable beam clamp, Carpenter & Paterson, Inc., Fig. 82 or approved equal.

5. Piping suspended from walls, trench walls and partitions shall be supported by steel support bracket. Carpenter & Paterson, Inc., Fig. 69 or approved equal.

B. Hanger Rods

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

Pipe Size	Rod Size
½" to 2"	3/8"

2. Provide toggle bolts for fastening to concrete blocks and compound anchor shields for bolts for fastening to poured concrete.

3. Provide lag points with rod couplings or side beam connectors with drive screws for fastening to wood.

4. All nuts for hanger rod to be stainless steel.

C. Supports

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

2.03 VALVES

A. General

1. Valves shall be provided as shown and as required to make the installation and its apparatus complete in operation, locate to permit easy operation, replacement and repair. All pressures specified are steam working pressure.

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

3. Globe valves shall be installed in all lines where regulation is required.

4. Check valves shall be installed in all lines where flow may reverse from intended direction.

5. Ball valves shall be installed on refrigerant piping connections at every air handler and evaporator coil.

6. All valves to comply with federal specifications and be so listed.

7. Butterfly valves shall not be used.

B. Types and Manufacturers

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

1. Globe Valves 2 inches in size and smaller shall have bronze bodies, union bonnet, renewable composition disc for service intended, rated for 150# WSP, 300# WOG:

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

2. Ball valves 1¼ inches in size and smaller shall have bronze bodies, brass stems and chrome plated brass balls, reinforced Teflon seats an seals, blow-out proof stems and adjustable stem gland. Shall be equipped with suitable packing for service intended. Ports shall be "full port". Rated for 400# WOG and 350^{o}F:

	Soldered Ends	Screwed Ends
Milwaukee	BA-350	BA-300
Apollo	82-200	82-100
Watts	B-6081	B-6080
NIBCO	------	------
Hammond	8614	8604

3. Ball valves 1½ and 2 inches in size shall have bronze bodies, two piece, standard port, brass stems and chrome plated brass balls, reinforced Teflon seats an seals, blow-out proof stems and adjustable stem gland. Shall be equipped with suitable packing for service intended. Rated for 400# Bar non-shock cold working pressure.

	Soldered Ends	Screwed Ends
Apollo	70-200	70-300
Watts	B-6000	B-6001
NIBCO	S-580-70-66	T-580-70-66
Hammond	8513	8503

4. Check Valves 2 inches in size and smaller shall be horizontal swing type with bronze body, Teflon disc. Rated for 125# WSP, 200# WOG:

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

2.04 HOT WATER SPECIALTIES

A. Automatic (Preset) Balancing Valves

1. New coils shall be provided on the return line from each unit with a pre-set balancing type valve equipped with readout taps to facilitate the connecting of a differential pressure meter. Valve body shall include a ball valve, flow control cartridge assembly, two (2) pressure/temperature plugs and inlet union. Valve bodies shall be line size.

2. Design

a. The GPM for the automatic flow control valves shall be factory set and shall automatically limit the rate of flow to within 5% of the specified amount.
b. For ½ inch to 2 inch sizes the flow cartridge shall be removable from the Y body housing without the use of special tools to provide access for regulator changeout, inspection and cleaning without breaking the main piping (Access shall be similar to that provided for removal of a Y-strainer screen).
c. True operating ranges of 2 - 32 psid or 5 - 60 psid are required. The design flow should be achieved at the minimum psi differential. A 50% safety factor applied to the lower operating range is not acceptable.
d. Each valve shall have two PIT ports.
e. All automatic flow control devices shall be supplied by a single source and certified flow tests, witnessed by a professional engineer, shall be available.
f. Provide factory product warranty of not less than five (5) years and free first year cartridge exchange.

3. Construction

a. Internal wear surfaces of the valve cartridge shall be electroless nickel or stainless steel.
b. Internal flow cartridge body shall have machined threads so the spring free height may be compensated for without the use of fixed shims. A crimped sheet metal design is not acceptable.
c. Internal flow cartridge shall be permanently marked with the GPM and spring range.
d. All valves shall be factory leak tested at 100 psi air under water.

4. Minimum ratings

   ½ inch through 2 inch pipe size: 400 PSIG at 250DF

5. Flow Verification

   a. Where indicated on the plans, the differential pressure across the Automatic Flow Control Valve shall be measured for flow verification and to determine the amount of system over heading or under pumping.
   b. Flow shall be verified by measuring the differential pressure across the coil served or the wide open temperature control valve and calculating the flow using the coil or valve Cv.

6. Installation

   a. Install automatic flow control valves on the return lines of coils as indicated on the plans. Balancing valve on supply side is not acceptable.
   b. The standard ports and handles shall clear 1 inch thick insulation. Handle and port extensions are required for over 1 inch thick insulation.

7. Units shall be Flow Design "AutoFlow" Model ACM for ½ inch and ¾ inch sizes or approved equal.

B. Strainers

1. New coils shall be provided on the supply line to each unit with a strainer equipped with ports to facilitate the connecting of a pressure gauge or thermometer and a hose end drain. Valve body shall include a ball valve and shall be line size.

2 Construction

   a. 20 mesh stainless steel strainer, removable without breaking the main piping.
   b. Ball valve shall have Teflon packing, brass packing nut, blowout-proof stem, large diameter plated ball and a handle with vinyl grip.
   c. A integral union shall be provided on the discharge end of the strainer and shall incorporate an EPDM O-ring and tailpiece. Unions shall be available in both male & female threaded and sweat configurations.
   d. Units shall be rated for 400 psig at 250^{o}F.

3. Strainers shall be mounted upstream of ATC control valves (see typical piping diagrams on drawings).

4. Units shall be by Flow Design Model YCM or approved equal.

C. Air Vents

1. Air vents shall be installed at new equipment, all high points in the new piping as indicated on the plans or as may be required.

2. Air vents shall consist of air chamber with a Dole No. 14A Coin Valve with copper tube extension. Install valve in accessible location.

2.05 FAN COIL UNITS

A. Fan coil units shall be provided and installed where shown and fastened securely. Units shall be mounted as indicated on the drawings and shall include a horizontal air handling unit with insulated casing, filter section and hot water coil of copper tubes with aluminum fins, tamper proof access door to motor control switch. Capacities shall be as indicated on drawings.

B. Units shall be tested in accordance with AHRI 430-1999 and AHRI 260-2001. The unit is UL 1995 listed in U. S. and Canada and complies with NFPA 90A. Air handlers consist of a hydronic and/or DX coil, drain pan, and centrifugal fan with motor and drive mounted in a common cabinet. Drive location and coil connections shall be independent for the same or opposite side location. Units shall be provided with knockouts in all four corners for installing the unit suspended from the ceiling with threaded rods.

C. Casings (structural components) shall be constructed of 18-gauge galvanized steel, insulated with one-inch, 1 ½ lb density fiberglass fire resistant and odorless glass fiber material to provide thermal and acoustical insulation. Fan housing sides shall be directly attached to the air handler top and bottom panels strengthening the entire unit assembly. Coil access panels shall be located on both sides of the air handler and allow easy removal of the internal coils and drain pan. Main access panels shall provide generous access to the fan, motor and drive from both sides of the air handler.

D. Interior surfaces of the unit shall be acoustically and thermally lined with 1 inch, 2.0 lb./cu. ft., R-Value of 4.3 density glass fiber with a foil facing. Insulation shall be UL listed and meet NFPA-90A, UL 181, and bacteriological C665 standards.

E. Hydronic heating coils shall be one, two, four, or six-row hot water. All water coils shall use high efficiency aluminum fins, mechanically bonded to seamless copper tubes. Coils shall be factory tested with 450 psi air under water. Maximum standard operating conditions shall be 300 psig, 200°F. with sweat type connections.

F. Fans shall be forward curved, centrifugal blower type equipped with heavy-duty adjustable speed V-belt drives. The fan shaft shall be supported by heavy-duty, permanently sealed ball bearings. Fans shall be dynamically balanced.

G. Motors shall be 60 Hertz, 1750 RPM with a plus or minus 10% voltage utilization range. Motors shall be open drip-proof with permanently sealed ball bearings, internal overload protection, and minimum 1.15 service factor and size 56 resilient base frames. Motors shall be factory installed and wired to the air handler junction box.

H. A filter box shall be provided, constructed of heavy gauge galvanized steel with an angle filter frame for use with 2 inch filters.

Filters shall be 2" thick with pleated throw-away media with a rated average dust spot efficiency of no less than 35 to 40 percent when tested in accordance with ASHRAE 52.1 atmospheric dust spot method, and MERV 8 rating based on ASHRAE Standard 52.2.

Provide three sets of filters for each unit. One to be installed before initial start-up and replaced with a new set at time of delivery to the Owner. Third set to be given to the Owner for future use.

I. Units shall be provided with a 4 inch x 4 inch junction box mounted on the drive side of the unit for motor power wire termination.

J. Units shall be Trance Model BCH for horizontal mounting. Approved equals by American Air Filter or McQuay will be considered.

2.06 FANS

A. General

1. Fans with capacity and types shown on the drawings shall be provided and installed. In order to establish a standard, fan model numbers indicated below are based on Cook (unless noted otherwise). Equivalent units by Acme, Greenheck and Penn ONLY will be considered.

2. Fan selection shall be based on sloping portion of curve with spare capacity of 20% of total CFM and static pressure without increasing motor size. **Provide full fan curves with submittals that shown the entire operating range of the fan - not just the operating point. Fans that are submitted without this data will not be accepted.**

3. All fans shall bear the AMCA Certified Ratings Seal for sound and air performance and shall be listed by the Canadian Standards Association Testing Laboratory (CSA). Sones indicated on drawings are AMCA ratings and are the maximum allowable. HVI sound ratings are not acceptable.

4. Motor operated dampers shall be furnished by ATC Contractor.

5. Wall caps shall be provided where indicated and shall include weather hoods extending to the bottom of the outlet. Units shall be 26 gauge (min) steel, primed for field painting and include a 0.020 inch damper with magnetic closure strips. Turn wall caps over to the General Contractor for finish painting prior to installation. All units for exhaust fans and range hoods shall be identical in appearance and shall be provided by Aldes Ventilation Corp. (http://www.americanaldes.com) 2000 Series or Artis Metals Company (http://www.artiscaps.com/exhaust.html). Wall caps provided with fans are not permissible unless they meet these design and construction standards.

B. Types

1. EF-20 shall be in-line mounted, direct driven, centrifugal exhaust fan, Model GN series.

Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Lboratories (UL 705) and UL listed for Canada (cUL 705). Fan shall bear the AMCA certified ratings seal for sound and air performance.

The outlet duct connection shall include an aluminum backdraft damper with continuous aluminum hinge rod. The inlet box shall be minimum 22 gauge galvanized steel. Motor shall be isolation mounted to a one piece galvanized stamped steel integral motor mount/inlet. A field wiring compartment with receptacle shall be standard. Unit shall be designed with provision for field conversion from ceiling to in-line. Unit shall be shipped in ISTA certified transit tested packaging.

Wheel shall be centrifugal forward curved type, injection molded of polypropylene resin. Wheel shall be balanced in accordance with AMCA Standard 204-96, *Balance Quality and Vibration Levels for Fans.*

Motor shall be open drip proof type with permanently lubricated sealed bearings and include impedance or thermal overload protection and disconnect plug. Unit shall include a, pre-wired, solid state speed control. Motor shall be furnished at the specified voltage and phase.

2. SF-1 shall be in-line mounted, direct driven, centrifugal exhaust fan, Model GN series.

Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Lboratories (UL 705) and UL listed for Canada (cUL 705). Fan shall bear the AMCA certified ratings seal for sound and air performance.

Housing shall be minimum 20 gauge galvanized steel and acoustically insulated. Blower and motor assembly shall be mounted to a minimum 14 gauge reinforcing channel and shall be easily removable from the housing. Motor shall be mounted on rubber-in-shear vibration isolators. Unit shall be supplied with integral wiring box and receptacle. Discharge position shall be convertible from right angle to straight through by moving interchangeable panels. Unit shall be shipped in ISTA certified transit tested packaging.

Wheel shall be centrifugal forward curved type, constructed of galvanized steel. Wheel shall be balanced in accordance with AMCA Standard 204-96, *Balance Quality and Vibration Levels for Fans.*

Motor shall be open drip proof type with permanently lubricated sealed bearings and include impedance or thermal overload protection and disconnect plug. Unit shall include a, pre-wired, solid state speed control. Motor shall be furnished at the specified voltage and phase.

2.07 SHEETMETAL

A. General

The work under this section includes all the required sheetmetal and duct work, extensions for grilles, manual dampers, setting of control dampers, grilles, registers, diffusers, flexible connections and brick vents as shown on the drawings or required to make the installation complete in accordance with the intent of the drawings and specifications.

B. Ducts

1. The size of ducts marked on the drawings will be adhered to as closely as possible. The right is reserved to vary duct sizes to accommodate structural conditions during the progress of the work without additional cost to the Owners. The duct layout is schematic to indicate size and general arrangement only. All ducts shall be arranged to adjust to "field conditions". The Sheet Metal Contractor shall coordinate his work with Division 26 and other trades.

2. Medium and low pressure ducts shall be constructed of galvanized steel in accordance with the following table of duct sizes OR the latest SMACNA HVAC Duct Construction Standards for Metal and Flexible Duct unless otherwise shown on drawings.

Low pressure ducts:

Dimensions of Longest Side (inches)	Minimum Sheet Metal Gauge
Up thru 12	26
13 --> 30	24

Medium pressure ducts with air velocities greater than 1,200 FPM:

Dimensions of Longest Side (inches)	Minimum Sheet Metal Gauge
Up thru 10	26
11 --> 12	24
13 --> 18	22

3. Methods of fabrication and installation shall be in strict accordance with guidelines set forth in the latest SMACNA Guide and Data Book for Low and Medium Pressure Duct Construction unless otherwise shown on drawings. Cross break all ducts with largest dimension being 18 inches and larger. Beaded ducts are not acceptable except for ductwork less than 18 inches in either direction.

4. All dampers and deflectors shall be a minimum of #22 gauge and stiffened as required. Splitter dampers shall not be acceptable.

5. All joints in new ducts shall be made air tight, and all branches and turns shall be made with long radius elbows and fittings. Long radius elbows are defined as having a centerline radius of 12 times the width of the duct. Where square elbows are used, elbows 18 inches wide and larger shall be provided with fixed double wall airfoil turning vanes designed to reduce the resistance of the elbow to the equivalent of a long radius elbow with a throat radius of not less than duct width. Square elbows less than 18 inches wide shall be provided with single wall turning vanes. Square elbows with outside corners cut at 45^{o} or rounded are not acceptable.

6. All ducts shall be installed with necessary offsets, changes in cross sections, risers, and drops which may be required. They shall be constructed with approved joints and be supported in an approved manner.

7. Round ductwork shall be constructed in accordance with the latest SMACNA HVAC Duct Construction Standards for round and oval duct construction. Ductwork larger than 8 inches in diameter shall employ spiral seams. All turns shall be made with smooth (not segmented), long radius elbows and fittings. All seams shall be type RL-5, grooved seam pipe lock or better. *Lap seams are not permissible*. Gauge thicknesses shall be as outlined in SMACNA for galvanized steel round duct gauge selections for maximum 2 inches w.g. static pressure. Ductwork shall be supported with full wrap-around band and single hanger strap as indicated in Figure 4-4 of the 1985 edition of the SMACNA HVAC Duct Construction Standards handbook.

8. Furnish and install flexible connections on new fans and fan coil units. Connections shall be made from Ventglas neoprene coated glass fabric as furnished by Ventfabrics, Inc., or approved equal.

9. Every precaution shall be taken to keep interior of new duct system free from dirt and rubbish and to protect all ducts and equipment during construction. At completion, this Mechanical Contractor shall thoroughly clean all equipment to the satisfaction of the Architect.

10. Spaces between ducts and wall or floor construction shall be caulked to make smoke and water tight by this section. Sealant material shall be 3M brand fire barrier caulk CP25 or putty 303, Ciba-Geigy CS240 Firestop Sealant or approved equal.

11. Testing, Balancing and Leak Testing... See Part 3, EXECUTION

12. Requirements set forth in applicable codes (see part one) shall supercede SMACNA standards.

C. Diffusers, Grilles and Registers

1. Grilles and/or registers shall be installed at all air supply, relief, return and exhaust openings as shown. All units to be aluminum, except as noted, and provided with baked enamel finish to match color of grille or register and countersunk screw holes. Mounting screws shall be oval head type with head painted to match finish. Unless stated otherwise, the following list is based on model numbers of Anemostat to establish a standard of quality (if substituting, certified sound criteria shall be included with submittals indicating CFM and NC levels of each register and grille).

    a. Exhaust and Return Registers: X3HOD with opposed blade damper and 3/4 inch, 45^{o} front blade spacing, front blades set horizontal.
    b. Exhaust, Return and Transfer Grilles: X3HD with ¾ inch, 45^{o} front blade spacing, front blades set horizontal.

2. Diffusers shall be installed at all air supply openings as shown. All units to be aluminum, except as noted, and provided with white baked enamel finish. The following list is based on model numbers of Anemostat to establish a standard of quality (if substituting, certified sound criteria shall be included with submittals indicating CFM and NC levels of each diffuser).

   Square face, steel construction, 4 way discharge with circular duct connection, removable core assembly, white prime finish. Model EPL for 24 inch x 24 inch lay-in application in suspended tile ceilings. Provide factory mounted straightening grid in the necks.

   All lay-in diffusers shall be supported to building structure with no less than two (2) safety chains located at opposing corners.

D. Brick Vent

1. Brick vent shall be extruded aluminum construction with inside bird screen and anodized finish in color to be selected by the Architect. Provide not less than 2 original color chip cards with submittals for review (electronic and photocopies not acceptable).

2. Unit shall be 8 inches deep and modular in dimension to fit 4 inch standard brick sizes. Units shall be minimum 0.125 inch thick with integral water stop, weep holes and continuous drip edge. Units shall be structurally designed to eliminate need of wall lintels with ¼ inch ribs and full depth headers at 16 inch centers (minimum).

3. Unit shall be BVC100 as manufactured by Ruskin or approved equal. Provide sample if substituting.

E. Duct Sleeves

Provide aluminum duct sleeves through outside wall at all locations as shown on drawings.

F. Sealing of Ducts

All interior ductwork shall be sealed with low VOC water based duct mastic, either "MP" (Multi-Purpose), Carlisle Hardcast "Iron-grip 601", Polymer Adhesive "Airseal #11", or United Duct Seal (United McGill Corp.) water base, latex or acrylic type sealant. All transverse joints to be continuously sealed. Note that, except as noted, oil or solvent based sealants are specifically prohibited for use on this project. Duct tape is prohibited exclusively.

All seams and joints in shop and field fabricated ductwork shall be sealed by applying one layer of sealant, then immediately spanning the joint with a single layer of 3" wide open weave fiberglass tape. Sufficient additional sealant shall then be applied to completely imbed the cloth. All sealants shall be UL rated at no more than flame spread of 5 and smoke developed of 0. At contractor’s option Hardcast 1602 sealant tape may be used in lap joints and flat seams.

G. Duct Access Doors

Hinged insulated access doors with seals shall be provided in ducts where indicated on drawings, or as required. Units shall be provided at each manual damper, motor operated damper, duct coil (both sides), duct mounted temperature control device and fire damper unless accessible through grilles and as shown on drawings. Units to be Ruskin Model ADH-22 for rectangular duct and Model ADR for round duct or approved equal by Elmdor.

H. Motor Operated Dampers

Motor operated control dampers mounted in ductwork shall be provided by ATC Contractor, but installed by this Contractor. Contractor shall seal dampers to ductwork to provide a completely waterproof and airtight seal between damper frames and ductwork.

I. Manual Dampers

1. See Part 3, EXECUTION for installation notes.

2. Manual dampers with smallest dimension 5 inches or less shall be shop fabricated, single 22 gauge blade, 3/8 inch rod, provided with position indicator and locking quadrant.

3. Manual dampers with smallest dimension larger than 5 inches but smaller than 11 inches shall be single blade steel, 16 gauge construction, provided with position indicator and locking quadrant. Unit shall be Ruskin Type MD35 or approved equal.

4. Manual dampers with smallest dimension larger than 11 inches shall be opposed blade steel, 16 gauge construction, linkage concealed in frame, provided with position indicator and locking quadrant. Unit shall be Ruskin Type MD35 or approved equal.

5. Dampers to be installed in aluminum ductwork shall be fabricated of aluminum or isolated from ductwork with rubber grommets between the damper and the duct to prevent oxidation between dissimilar metals.

6. Provide hand quadrants for <u>all</u> manual dampers, Ventline Model 560 or approved equal.

J. Flexible Duct

Provide and install insulated flexible duct where shown on drawings. Ducts shall be a double lamination of polyester encapsulating a steel wire helix forming an air-tight inner core. The core shall be wrapped in a blanket of fiberglass insulation (R 4.2) and sheathed in a rugged and durable reinforced metallized polyester jacket. Duct shall be class 1, U.L. 181 compliant and rated for not less than 2 inches w.g. positive working pressure. Duct internal diameter shall be same size as diffuser served. Atco UPC 030 or approved equal.

K. Bellmouth Takeoff Fittings (for flexible duct)

Provide and install, at all flexible duct branches to diffusers, a bellmouth side takeoff fitting with manual damper. Fittings shall be pre-manufactured with bell end shall have a 1½ inch radius and employ a self-adhesive gasket seal and be pre-drilled for attachment screws. Dampers shall be heavy duty with bearings and hand quadrants. Fittings shall be anchored to ductwork with *not less than* three (3) screws. Final diameter shall be same size as diffuser served. Units shall be no thinner than 22 gauge, G-90 galvanized steel. Buckley Bellmouth HD-BM, HD-BMD or approved equal by Flexmaster or United Enertech.

L.. Turning Vanes

1. Provide and install at all square duct elbows 18 inches and larger, and where shown on drawings, fixed double wall airfoil type turning vanes. Turning vanes shall be constructed as outlined in the latest SMACNA HVAC Duct Construction Standards guidebook, Figure 2-3.

2. Provide and install at all square duct elbows less than 18 inches in width, and where shown on drawings, fixed single wall turning vanes. Turning vanes shall be constructed as outlined in the latest SMACNA HVAC Duct Construction Standards guidebook, Figure 2-3.

2.08 PIPE AND EQUIPMENT IDENTIFICATION

Tag each new fan and fan coil unit with rectangular engraved nameplates with white letters on black, Brady Corp., Seton Name Plate Corp. or approved equals. Nameplates shall be mechanically fastened to equipment (adhesives are not acceptable). Embossed labels are not acceptable.

Nameplates shall be 2½ inches by ¾ inch, Setonply Style No. M1771.

Identify all new heating hot water supply and return piping with "Set Mark" full snap-around pipe markers by Seton Name Plate Corporation or approved equal by Brady Corp. Markers shall include both identification and direction of flow. Use yellow background with black letters. Markers shall be no less than 10 feet apart and identification shall read “Heating Water Supply” and “Heating Water Return” as applicable. Domestic hot and cold water piping shall be labeled differently from heating water piping.

2.09 INSULATION AND CONDENSATE PROTECTION

A. General

1. Insulation shall be provided for all new ductwork, hot water supply and hot water return piping and other insulation where shown on drawings.

2. All insulation products shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less per ASTM E 84, UL 723 and NFPA 255.

B. Hot Water Supply & Return Piping

1. All new hot water supply and return piping shall be insulated with heavy density fiberglass pipe insulation with 850°F. temperature rating and factory applied self sealing ASJ jacket. Cut insulation to include pipe hangers. Any existing pipe insulation which has been removed or damaged as a result of construction shall be re-insulated to conform to this specification. Maximum "k" factor of 0.23 at 75°F. mean temperature difference per ASTM C 518. Owens Corning SSL II, Johns Manville Micro-Lok HP or approved equal.

   Insulation thickness for hot water shall be as follows:

Pipe Size	Insulation Thickness
½" – 1½ "	1½"
2" - 8"	2"

2. All fittings shall be wrapped with fiberglass insulation and covered with a one piece PVC insulated fitting cover secured with flare type stainless steel staples.

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

4. Valves need not be insulated.

C. Duct Insulation

1. New duct insulation shall be a ¾ pound density, all-service fiberglass duct wrap with factory applied foil faced FRK vapor barrier facing meeting the requirements of ASTM C 1136, Type II. Insulation material shall meet the requirements of NFPA 90A, NFPA 90B, ASTM C 1290 and ASTM C 553. Operating temperature range shall be from 40°F. to 250°F. Maximum "k" factor of 0.30 at 75°F. mean temperature difference. Owens Corning Type 75, Johns Manville Microlite XG or approved equal.

2. Insulate the following ducts with 1½ inches installed thickness fiberglass duct wrap:

   a. New supply air ductwork from fan coil units.

3. Insulate the following ducts with 3 inches installed thickness fiberglass duct wrap:

   a. New outdoor air intake ductwork from brick vent to connection to return air ducts at fan coil units.
   b. Exhaust duct from EF-20 between outside wall and motor operated damper.

4. Material to carry U. L. label. All laps to be sealed and held in place with adhesive and flare staples. All lap joints to be folded under before stapling so no raw insulation will be showing. On the bottom of ducts 24 inches or wider, mechanical fasteners shall be provided approximately 12 inches O.C.

H. Condensate Protection

Solder or weld bottom and sides of ducts connected to outdoors to prevent water leaks from rain and snow. Seal duct wrap and liner to minimize condensation.

I. Installation

All insulation work shall be executed by skilled insulation workmen regularly employed in the trade.

2.10 AUTOMATIC TEMPERATURE CONTROL (ATC)

A. General

1. ATC system shall be an extension of the existing DDC system as furnished and maintained by T.A.C. Maine Controls, 400 Presumpscot Street, Portland, Maine 04103 (207) 774-0220

3. ATC Contractor must be capable of providing, installing and servicing the control system in its entirety. Sub contracting of parts or partial sections of the ATC system is not permitted. Exception: Sub contracting of ATC wiring is permissible but the ATC contractor shall be ultimately responsible and liable for proper installation as outlined in Divisions 23 and 26 of this specification.

4. The control systems shall be provided and installed by trained control mechanics, regularly employed by the approved vendors, in installation and calibration of ATC equipment. No other vendor will be accepted.

5. Shop drawings of entire control system shall be submitted for approval before work is started.

6. Provide ATC technician to test the complete ATC systems sequences for specified cycles of operation with the Testing and Balancing Contractor.

7. ATC Contractor must, at the end of the warranty period, furnish the Owner with all access codes and passwords assigned to the ATC control systems. ATC Contractor shall also instruct the Owner in the use of all digital control software and provide a backup copy of the final software package to the Owner on CD.

B. Scope

Control system shall consist of all new area thermostats, valves, motorized dampers, damper operators, relays, transformers, labor and other accessory equipment, and a complete system of wiring to fulfill intent of ATC specification. Control shall be provided for, but not limited to the following:

1. Two new fan coil units and heating coils
2. Fans operated by ATC system

C. Incidental Work by Others

1. The following incidental work shall be furnished by the designated contractor under the supervision of the Control Contractor.

a. Mechanical Contractor shall:

(1) Install automatic valves and separable wells that are specified to be supplied by the Control Contractor.
(2) Furnish and install all necessary valved pressure taps, water, drain and overflow connections and piping.

b. Sheet Metal Contractor shall:

(1) Install all automatic dampers.
(2) Provide necessary blank-off plates required to install dampers that are smaller than duct size.
(3) Assemble multiple section dampers with required interconnecting linkages and extend required number of shafts through duct for external mounting of damper motors.
(4) Provide access doors or other approved means of access through ducts for service to control equipment.

c. The General Contractor shall:

(1) Provide all necessary cutting, patching and painting.
(2) Provide access doors or other approved means of access through ceilings and walls for service to control equipment.

d. Division 16 shall:

(1) Provide power motorized dampers.

D. Electric Wiring

1. All low voltage and data wiring for installation of temperature controls shall be by ATC Contractor, except as noted. Power wiring for equipment shall be by Division 16, "ELECTRICAL". See Part 1, Paragraph 1.03, sub-paragraph C, 'MECHANICAL ELECTRICAL WORK" for specific requirements. Exception: Power wiring from circuit breaker to temperature control panel(s) will be provided and installed by the ATC Contractor.

2. ATC Contractor shall be responsible for coordinating installation of his wiring conduits with Division 26, "ELECTRICAL".

E. Submittal Brochure

The following shall be submitted for approval:

1. Control drawings with detailed wiring diagrams, including bill of material and description of operation for all systems.

2. Valve and damper schedules showing size, configuration, capacity and location of all equipment.

3. Product data for all control system components.

F. Instruction and Adjustment

Upon completion of the project, the Temperature Control Contractor shall:

1. Adjust for use by Owner, all new thermostats, controllers, valves, damper operators, and relays provided under this section.

2. Furnish two (2) instruction manuals covering function and operation of control systems for use of the Owner's operating personnel. A competent technician shall be provided for instruction purposes.

3. ATC Contractor shall be responsible for balancing return air, exhaust (relief) air and outdoor air dampers on air handling units in order to achieve proper mixed air temperatures.

G. Guarantee

Control system shall be guaranteed to be free from original defects in both material and workmanship for a period of not less than one (1) year of normal use and service. This guarantee shall become effective starting the date Architect agrees Owner has begun to receive beneficial use of the system.

H. Hazardous Materials

Mercury, or any other material deemed hazardous by the Federal Environmental Protection Agency or the State of Maine Department of Environmental Protection, shall not be used in any components of the ATC system.

I. Thermostats

1. New thermostats for fan coil units shall DDC type with indexing switches to automatically index the day/night thermostat to its day mode and provide day temperature regardless of the setting of the DDC occupied/unoccupied program timer.

2. Thermostats shall be mounted according to ADA requirements (http://www.access-board.gov/adaag/html/adaag.htm#4.27).

3. Provide heavy duty clear plastic temper proof guards over thermostats where indicated.

J. Low Temperature Safety Thermostat

Low temperature warning thermostats shall have be installed to cover the entire heating coil area of each fan coil unit. These thermostats shall be two position manual reset type and wired to shut down the supply fan and signal a DDC alarm on a freeze condition.

K. Automatic Control Valves

All new automatic control valves shall be fully proportioning with modulating plug or V-port inner guides, unless otherwise specified. The valves shall be quiet in operation and fail safe in either normally open or normally closed position in the event of control air failure. All valves shall be capable of operating in sequence when required by the sequence of operation. All control valves shall be sized by the control manufacturer and guaranteed to meet the heating and cooling loads as specified. All control valves shall be suitable for the pressure conditions and shall close against the differential pressure involved. Body pressure rating and connection type (screwed or flanged) shall conform to pipe schedule in this specification.

Butterfly valves are not permitted.

L. Miscellaneous Devices

Provide all the necessary relays, positioners, transformers, etc. to make a complete and operable system.

M. Dampers

1. Control dampers shall have 16 gauge galvanized frames not less than 2 inches in width with airfoil blades not less than 14 gauge galvanized steel, and shall be adequately braced to form a rigid assembly. No dampers shall have blades more than 6 inches wide. Dampers shall be painted with one coat of lacquer. Dampers shall be two position or proportioning as required by specific application, opposed blade type with linkage concealed within the frame. Oilite bronze bearings shall be provided at the ends of damper blades. ALL DAMPERS SHALL BE MOUNTED WITH BLADES ORIENTED HORIZONTALLY.

2. Damper operators shall be provided with bracket arrangement for location outside of air stream wherever possible. All damper motors shall be sufficient size to operate dampers, including slow opening and fast closing.

3. Dampers shall be provided with flexible metal edge and jamb seals and neoprene blade edge seals for tight closure. Leakage shall be certified to be no more than 2.0 CFM per square foot at 1 inch w.g. on units 24 inches wide and larger, 3.0 CFM per square foot at 1 inch w.g. on units less than 24 inches wide.

4. Dampers shall be Ruskin Model CD60, Air Balance Model AC-516, Arrow or approved equal.

N. Description of Operation

1. Heating system shall be hot water with water supplied at a maximum of 180°F.

2. Existing VAV unit

ATC Contractor shall relocate the existing thermostat as shown and retain the current control sequence. Also relocate the existing control valve if not located where shown on drawings.

3. New Fan Coil Units

Occupied/unoccupied periods shall be determined by the existing DDC system. During occupied periods the units shall operate continuously. During unoccupied periods fans shall operate intermittently on call for heat from the space thermostats.

When the space thermostats call for heat the valves on the hot water supply to the coils shall modulate as required to satisfy the thermostat.

Provide a low limit discharge sensor in the main supply duct of each unit to signal an alarm at the main DDC controller. Set alarm point for 10°F. below the setting of the thermostat.

4. Fans

Supply Fan 1 and Exhaust Fan 20 shall operate continuously (and their respective motorized dampers shall open) when the DDC system is in the occupied mode. Fans shall remain off and dampers closed in the unoccupied mode.

5. Freeze Protection

Freeze protection thermostats shall be installed in each new fan coil unit. Should either sense a freeze condition (discharge temperature of 40°F. or less) the motor in the effected fan coil unit shall be shut off, SF-1 deactivated and the motorized damper closed. An alarm shall be signaled at the DDC main computer. Freeze-stats shall be manually reset.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all work is complete to the point where this installation may properly commence.

2. Verify that Mechanical systems may be installed in strict accordance with all pertinent codes and regulations and the approved shop drawings.

B. Discrepancies

1. In the event of discrepancy, immediately notify Architect.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 INSTALLATION OF PIPING AND EQUIPMENT

A. General

1. All piping shall be installed within building insulation.

2. Size and general arrangements as well as methods of connecting all piping, valves, and equipment shall be as indicated, or to meet requirements for complete installation.

3. All piping shall be erected to provide for easy and noiseless passage of hot water under all working conditions. Inverted eccentric reducing fittings shall be used whenever pipes reduce in size in the direction of flow. Tee fittings with reduction in the main direction of flow (run) are not acceptable.

4. All hot water mains shall be run level or pitch slightly upward so that no air pockets are formed in piping. Mains shall be set at elevations so runouts feeding heating equipment shall have no pockets where air can collect or automatic vents shall be provided.

5. Provide drains with hose threads and metal caps at all low points in the water piping system.

6. In erection of water piping care must be taken to make allowance for expansion and contraction. Piping shall be anchored as necessary to control expansion.

7. Install approved dielectric fittings at all points of dissimilar piping connections.

8. Install a sufficient number of unions or flanges to facilitate assembly and disassembly of piping and removal of equipment.

9. 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.

10. Inspect each piece of pipe, tubing, fittings, and equipment for defects and obstructions; promptly remove all defective materials from the job site.

11. 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.

12. All risers and offsets shall be substantially supported.

13. Make all changes in pipe size with approved reducing fittings.

14. All low points in water piping shall be provided with an accessible plug tee or drain valve.

15. All high points in water piping shall be provided with an accessible automatic vent.

16. Maximum spacing of hangers for steel piping shall be as follows:

Pipe Size	Spacing
½", ¾" & 1"	6'-0"

17. Maximum spacing of hangers for copper piping shall be as follows:

Pipe Size	Spacing
½", ¾" & 1"	6'-0"

18. Whenever possible valves shall be installed with the operating stems in the upright position, however when conditions dictate it is acceptable to position valves 90^{o} to either side of vertical. Valves shall not be installed with the stems in the downward position.

19. Do not substitute one style of valve indicated on drawings for another unless authorized by the Architect. Example: If a gate valve is shown use only a gate valve or if a ball valve is shown use only a ball valve.

B. Joints and Connections

1. Smoothly ream all cut pipe; cut all threads straight and true; apply best quality Teflon tape to all male pipe threads but not to inside of fittings; use graphite on all plugs.

2. Make all joints in copper tube (water and drains) with 95-5 tin-antimony solder applied in strict accordance with the manufacturer's recommendations.

C. Fire Safety

Fire extinguishing equipment shall be kept within 25 feet of soldering areas at all times. Contractor shall take additional measures when soldering close to wood structures to protect the wood from igniting.

3.03 PIPING TEST AND ADJUST

A. During the installation, all new hot water supply and return piping shall be tested with water to a pressure of not more than 125 psi and held for a period of not less than four (4) hours. Isolate any piping or devices not designed for this pressure. Any leaks shall be repaired and another test applied to the piping. All piping shall be tested before it is insulated or otherwise concealed. Contractor shall be required to certify in writing that piping has been tested and conforms to these requirements.

B. Before operating the water system, all of the new piping shall be flushed out to remove oil and foreign materials. This shall be accomplished by circulating a solution of heavy duty detergent by use of Mechanical Contractor supplied pump.

D. After the installation is complete and ready for operation, the system shall be tested under normal operating conditions in the presence of the Architect and demonstrated that the system functions as designed.

E. It shall be demonstrated that all parts of new heating system have a free and noiseless circulation of water and that all parts are tight. It shall also be demonstrated that all units are functioning properly and that control system operates correctly.

F. Should any defects in operation develop during the test periods, the Mechanical Contractor will proceed to correct defects immediately. Additional tests will be conducted after correction.

3.04 INSTALLATION OF DUCTWORK AND EQUIPMENT

A. General

1. Size and general arrangements as well as methods of connecting all diffusers, registers, grilles, duct coils and equipment shall be as indicated, or to meet requirements for complete installation.

2. Construction standards and sheet metal gauges shall be as outlined in the latest edition of the SMACNA HVAC Duct Construction Standards handbook for metal and flexible ducts unless specifically indicated otherwise.

3. Do not use segmented elbows or screws to connect fittings on clothes dryer ducts. Use smooth, long radius elbows and pop rivets instead.

4. Manual Dampers

a. Manual dampers may be shop-fabricated on units 5 inches in height and less. All dampers larger than 5 inches must be pre-fabricated as previously outlined in this specification.

b. All manual dampers located within 10 feet of a fan outlet shall have the blades oriented perpendicular to the fan shaft.
c. Provide duct access door as large as possible up to 12 inches x 12 inches at each manual damper larger than 5 inches.

B. Protection and Cleaning

1. All open ends of ductwork which is to be unattended for 4 hours or more shall be temporarily protected with plastic sheeting and duct tape (or similar method) to reduce the collection of construction dust and debris.

2. Prior to testing and balancing and at the end of the construction, clean the interiors of all supply and return air ductwork before changing filters in air handling equipment. Careful coordination must be maintained between the time of testing and balancing and final delivery to avoid re-accumulation of dust and debris within the duct systems which will require additional cleaning by the Mechanical Contractor.

3.05 TESTING, ADJUSTING AND BALANCING (TAB)

A. General

1. TAB contractor shall be a subcontractor to the Mechanical Contractor.

2. The TAB Contractor must provide, for review, contact information and copies of qualifications and certifications through the shop drawing review process. The following is a list of acceptable TAB contractors.

a. Central Air Balance
b. Maine Air Balance
c. Tab-Tech International
d. Tekon-Technical Consultants
e. Yankee Balancing

No others will be accepted unless pre-approved prior to opening of bids.

3. TAB contractor shall perform functional performance test of all Division 15 equipment and entire ATC system for specified operation and control sequences.

4. The mechanical contractor shall startup all Division 15 equipment as required by the equipment specifications. Mechanical contractor shall verify that systems are complete and operable before TAB commencing work. Ensure the following conditions:

a. New systems are started and operating in a safe and normal condition.
b. ATC systems are installed complete and operable.
c. Proper thermal overload protection is in place for electrical equipment.
d. Final filters are clean and in place. If required, install temporary media in addition to final filters.
e. Duct systems are clean of debris.
f. Fans are rotating correctly.

g. Volume dampers are in place and open.
h. Air coil fins are cleaned and combed.
i. Access doors are closed and duct end caps are in place.
j. Air outlets are installed and connected.
k. Duct system leakage is minimized.
l. Hydronic systems are flushed, filled, and vented.
m. Proper strainers are clean and in place. Service and balance valves are open.

5. TAB Contractor shall submit field reports to General Contractor. Report defects and deficiencies noted during performance of services which prevent system testing and balance.

6. TAB contractor shall submit all verification and functional performance checklists/results, signed by indicated personnel, organized by system and sub-system.

7. TAB contractor shall submit other reports described below.

B. Work Included

1. Test, adjust and balance all new air and water systems, including components to conform to air and water flow rates shown on drawings.

2. Test complete automatic temperature control sequences for specified operations described under AUTOMATIC TEMPERATURE CONTROLS.

3. Complete and submit balance report. Report shall be submitted with information noted on one side of sheet only (i.e., backside of sheet shall be blank.).

4. Testing of air and water systems will be done by the same agency.

5. Mechanical Contractor shall provide copies of shop drawings indicating coil gpm’s, air handling unit air volumes, etc. to the TAB contractor at no cost to the contractor.

6. Careful coordination must be maintained between the time of testing and balancing and final delivery to avoid re-accumulation of dust and debris within the duct systems which will require additional cleaning by the Mechanical Contractor.

C. Quality of Compliance

1. Qualification: TAB Contractor must be independent test and balancing agency.

2. AABC Compliance: Comply with AABC Manual MN-1 "AABC National Standards" as applicable to mechanical and hydronic distribution systems and/or Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

3. Industry Standards: Comply with ASHRAE recommendations for measurements, instruments and testing and balancing.

4. Coordination: Work together with Automatic Temperature Control Contractor to adjust set points of various devices to balance system(s) and test ATC sequences of operation. Temperature Control Contractor shall be responsible for balancing return air, exhaust (relief) air and outdoor air dampers on Air Handling Units in order to achieve proper mixed air temperatures.

5. ASHRAE Guideline 1-1996, "The HVAC Commissioning Process".

D. Execution of TAB Work

1. TAB Contractor shall visit job site and determine that control devices, test devices and valves are correctly installed and ready for balancing.

2. Examine each air and hydronic distribution system to see that it is free from obstructions. Determine that all dampers, registers and valves are in a set or full open position; that moving equipment is lubricated, and that required filters are clean and functioning. Request that Installing Contractor perform any adjustments necessary for proper functioning of the system.

3. TAB Contractor shall use test instruments that have been calibrated within a time period recommended by the manufacturer, and have been checked for accuracy prior to start of testing, adjusting and balancing activity.

4. Verify that all equipment performs as specified. Adjust variable type drives, volume dampers, control dampers, balancing valves and control valves as required by TAB work.

5. Test pressure profile of systems by traverse as required.

6. Adjust each register, diffuser terminal unit and damper to handle and roperly distribute design airflow within 5% of specified quantities. Mark all setpoints.

7. Adjust front and rear discharge louvers on each supply register to distribute air in an even pattern or as indicated on plans.

8. Take readings of all new balancing valves to ensure they are delivering the specified water GPM.

9. Adjust air discharge patterns of all supply air diffusers, registers and grilles for optimal air diffusion.

10. Document results of all testing on approved TAB report formats and submit 3 copies for approval and record within 15 days of completion of TAB work. Include a warranty period of 90 days, during which time the Architect/Engineer may request a re-check or re-adjustment of any part of the work.

11. Reports shall be compiled on a spreadsheet such as Excel, Quattro-Pro, Lotus, etc. and shall clearly indicate the following *minimum* information:

    a. Air (Rated and Actual)

        1) System/unit name
        2) HP, BHP, voltage, amperage and fan rpm
        3) Static pressures; suction, discharge and total
        4) Total system flow rate
        5) Individual terminal flow rates (Terminal readings must show location, make, model and size of register, grille or diffuser).
        6) Provide a static pressure profile of all AHU's components in the two extreme operating modes; minimum outdoor air and economizer cycle.
        7) Filter status report

    b. Water

        1) Balancing device readings will indicate location, size, rated and actual gpm.

Reports to have a minimum of color or must be compatible with monochrome printers. Reports must be submitted to the Architect electronically in addition to hard copies.

E. Drawings

Drawings in CAD format may be made available to the TAB Contractor after the contract for this work is awarded. Contact the Engineer via telephone or at mechsyst@maine.rr.com and request the drawings, indicating CAD format required and a return e-mail address. See par. 1.09, “ELECTRONIC DRAWINGS AND FILE SHARING” for additional information.

3.06 CLOSING IN UNINSPECTED WORK

A. General

Do not cover up or enclose work until it has been properly and completely inspected and approved.

B. Contractor is required to provide not less than 48 hours advance notice to the Architect of intent to cover non-inspected work to permit time for scheduling inspections.

C. Noncompliance

Should any work be covered up or enclosed prior to all required inspections and approvals, the Architect reserves the right to order the uninspected work to be uncovered for inspection at the Contractor’s expense. After the work has been inspected completely and approved, make all repairs and replacements with materials necessary for approval by the Architect and at no additional cost to the Owner.

3.07 TEMPORARY HEATING

A. There is no requirement for temporary heat but the Mechanical Contractor shall install the new systems and related equipment as soon as those portions of the building are ready and the work can be performed.

B. New systems shall not be used for temporary ventilation until construction reaches a point where airborne dust, paint and other contaminants are no longer present. All openings to fans and fan coil units shall be covered until ductwork is connected. At the conclusion of the construction the complete system shall be thoroughly cleaned.

C. Water, fuel and electric power required to perform mechanical work shall be provided by the Owner.

3.08 CLEANING

Prior to acceptance of the buildings, thoroughly clean all exposed portions of the Heating, Ventilating and Air Conditioning installation, including the removal all labels and all traces of foreign substance. Prior to testing and balancing vacuum and clean inside of all convectors, finned radiators (spackle droppings), unit ventilators, air handling units, VAV units, fans and cabinet unit heaters. Clean the interiors of ductwork as outlined in 3.04, “INSTALLATION OF DUCTWORK AND EQUIPMENT”; paragraph “B”, “Protection and Cleaning”.

309 INSTRUCTIONS

On completion of the job, the Mechanical Contractor shall provide a competent technician to thoroughly instruct the Owner's Representative in the care and operation of the system. The total period of instruction shall not exceed one (1) hour. ATC system instruction shall be in addition to this instruction period. The time of instruction shall be arranged with the Owner.

3.10 REMOVAL OF EXISTING PIPING AND EQUIPMENT

A. All piping and equipment indicated on the drawings for removal shall be done so by the Mechanical Contractor.

B. All materials removed shall remain the property of the Owner until such time the Owner has reviewed the removed materials and either taken or designated items which he may wish to retain. The remainder shall become the property of this Mechanical Contractor and be removed from the premises immediately.

C. Any damages done to removed materials prior to release by the Owner shall be corrected by the Mechanical Contractor at no additional expense to the Owner. Any materials removed prior to release by the Owner shall be replaced by the Mechanical Contractor at no additional expense to the Owner.

3.11 RECYCLING

Discarded materials, both new and removed, shall be recycled whenever practical through metal salvage dealers (ductwork, piping, etc.), paper salvage (cardboard shipping containers, etc.), wood & plastic products, etc. The Mechanical Contractor shall retain the salvage value of discarded materials and may use this value to offset his project bid price if so desired. Toxic materials such as adhesives, coolants, refrigerants, etc. SHALL be disposed of in a manner acceptable to the State of Maine Department of Environmental Protection.

3.12 HAZARDOUS MATERIALS

Mercury, asbestos or any other material deemed hazardous by the Federal Environmental Protection Agency or the State of Maine Department of Environmental Protection, shall not be used in any components of the mechanical systems.

END OF SECTION 23 00 00

SECTION 26 00 00

GENERAL REQUIREMENTS FOR ELECTRICAL WORK

PART ONE: GENERAL

1.1 General Requirements

1.1.1 Definition of Work

Conditions of the Contract, Specifications, Change Orders, Addenda and Drawings apply to work of this section.

1.1.2 Provisions

As used in this section, "provide" means "furnish and install", "furnish" means "to purchase and deliver to the project site complete with every necessary appurtenance and support and to store in a secure area in accordance with manufacturers instructions", and "install" means "to unload at the delivery point at the site or retrieve from storage, move to point of installation and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project".

1.1.3 Existing Site Conditions – Responsibilities Prior to Bid

Before submitting a bid, the Electrical Subcontractor shall visit and carefully examine site to identify existing conditions and difficulties that may affect the work of this Section. No extra payment will be allowed for additional work caused by unfamiliarity with site conditions.

1.1.4 Existing Site Conditions – Responsibilities Prior to Starting Work

Before starting work in a particular area of the project, the Electrical Subcontractor shall examine the conditions under which work must be performed including preparatory work performed under other Sections of the Contract, or by the Owner and report conditions which might adversely affect the work in writing to the Engineer. Do not proceed with work until defects have been corrected and conditions are satisfactory. Commencement of work shall be construed as complete acceptance of existing conditions and preparatory work.

1.2 Applicable Codes and Standards

1.2.1 Work

All work shall be in accordance with the laws, rules, codes, and regulations set forth by Local, State, and Federal authorities having jurisdiction. All products and materials shall be manufactured, installed and tested as specified, but not limited to the latest accepted edition of the following codes, standards and regulations:

NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Act
NEC	National Electrical Code (NFPA 70)
UL	Underwriters Laboratory
NESC	National Electrical Safety Code

FM	Factory Mutual Association
MUBEC	Maine Uniform Building and Energy Code
Local AHJ	Local and State building, electrical, fire and health department and public safety codes agencies.

1.2.2 Code Conflicts

When requirements cited in this Paragraph conflict with each other or with Contract Documents, the most stringent requirements shall govern conduct of work. The Engineer may relax this requirement when such relaxation does not violate the ruling of authorities that have jurisdiction. Approval for such relaxation shall be obtained in writing. Should the Electrical Subcontractor perform any work that does not comply with the requirements of the applicable building codes, state laws, and industry standards, he shall bear all costs arising in correcting these deficiencies.

1.3 Contract Documents

1.3.1 Work to be Provided

Work to be provided under this division is shown on the electrical drawings listed in Division 1, General Requirements and in these Contract Specifications.

1.3.2 Coordination of Work

The listing of electrical drawings does not limit the responsibility of determining the full extent of work that is required by these contract documents. The Electrical Subcontractor shall refer to the drawings and other specification sections included in the complete Contract Package, that indicate types of construction with which work of this section must be coordinated. The General Contractor shall coordinate the work of all trades including that of the electrical contractor, with all other subcontractors to determine whether there will be any interference with the electrical work. If the Electrical Subcontractor fails to check with the General Contractor and the electrical work is later found to interfere with the work of other subcontractors, then he shall make necessary changes, without additional cost to the Owner, to eliminate such interference.

1.3.3 Intent of Design

Drawings are diagrammatic and indicate the general arrangement of systems and work to be included in the Contract. Information and components shown on riser diagrams or called for in the specifications but not shown on plans, and vice versa, shall apply and shall be provided as though required expressly by both. The contract documents are not intended to indicate and specify each component required, but do require that the components and materials be provided for a complete and operational installation.

1.3.4 Discrepancies in Documents

Each bidder shall be responsible for examining the drawings and specifications carefully before submitting his bid, with particular attention to errors, omissions, conflicts with provisions of laws and codes imposed by authorities having jurisdiction, conflicts between portions of drawings, or between drawings and specifications, and ambiguous definition of the extent of coverage in the contract. Any such discrepancy discovered shall be brought to the immediate attention of the Engineer for correction. Should any of the aforementioned errors, omissions, conflicts or ambiguities exist in either or both the drawings and specifications, the Electrical Subcontractor shall have the same explained and adjusted in writing before signing the contract or proceeding with work. Failure to notify the Engineer in writing of such irregularities prior to signing the Contract will cause the Engineer's interpretation of the Con-

tract Documents to be final. No additional compensation will be approved because of discrepancies thus resolved.

1.3.5 Conflicts with Codes and Regulations

The drawings and these specifications are intended to comply with all the above mentioned Codes, Rules and Regulations. If discrepancies occur, the Electrical Subcontractor shall immediately notify the Engineer in writing of said discrepancies and apply for an interpretation and, unless and interpretation is offered in writing by the Engineer prior to the execution of the contract, the applicable rules and regulations shall be complied with as a part of the contract.

PART TWO: SCOPE OF WORK

2.1 General Requirements

2.1.1 General Scope

The work to be accomplished under these specifications includes providing all labor, materials, equipment, consumable items, supervision, administrative tasks, tests and documentation required to install complete and fully operational electrical systems as described herein and shown on the Drawings.

2.1.2 Administrative Responsibilities

The Electrical Subcontractor shall file plans, obtain permits and licenses, pay fees and obtain necessary inspections and approvals from authorities that have jurisdiction, as required to perform work in accordance with all legal requirements.

2.1.3 Coordination with Local Utility Companies

The Electrical Subcontractor shall coordinate with the local Power, Telephone, and Cable System Utilities if required. The Electrical Subcontractor shall be responsible for paying any Utility charges and excess costs incurred. The Electrical Subcontractor shall perform all work in accordance with utility company requirements.

2.2 Work to be Provided Under this Division

2.2.1 General Scope

The Work shall be complete from point of service to each outlet or device with all accessory construction and materials required to make each item of equipment or system complete and ready for operation. The work shall include but not be limited to the following. The Electrical Subcontractor shall provide:

A. **Service Entrance:** The intent is to use the existing service to the building.

B. **Grounding System:** Provide all equipment and wiring to connect new feeders, equipment and other systems as required by the National Electrical Code to the existing building grounding system.

C. **Temporary Power:** All charges for temporary service provided (if required), and all equipment, wiring and lighting as required and defined later in this specification section.

D. **Power Distribution Systems:** Intent is to provide additional equipment to the existing power distribution panelboards including but not limited to overcurrent devices, raceway, cable and wire.

E. **Feeder and Branch Circuit Wiring:** Provide feeder and branch circuits and devices for power to equipment and convenience receptacles. This includes branch wiring to system control panels furnished under other sections.

F. **Motor Circuit Wiring:** Provide all motor wiring, safety disconnects, and motor starters unless integral with equipment.

G. **Interior Lighting Systems:** Provide complete interior lighting system including normal and emergency fixtures, exit signs, lamps, controls, trim and accessories.

H. **Telephone and Data Systems:** Provide complete voice/data system conduits, Cat 5E wiring back to the school patch panel.

I. **Security Systems:** Furnish conduits and power for security equipment as shown on the plans.

J. **Cable Television Systems:** Provide empty conduit for CATV outlets.

K. **Control Wiring:** Provide control wiring not provided by Division 15000.

L. **Supports and Fittings:** Provide all support material and hardware for raceway, cable tray and electrical equipment.

M. **Terminations:** Provide terminations of all cable and wire unless otherwise noted.

N. **Penetrations:** Provide all building wall, floor and roof penetrations for raceway and cable tray where not provided by the General Contractor.

O. **Other Items Furnished By Others:** Install the following equipment furnished by others:

1. Motors

2. Control Panels

3. Wiring to magnetic door holders.

2.3 Work not Included Under this Division

2.3.1 Related Work Included in Other Sections

The following work is not included in this Section and shall be performed under other sections:

A. Excavation and backfill.

B. Concrete work, including concrete housekeeping pads and other pads and blocks for vibrating and rotating equipment.

C. Cutting and patching of masonry, concrete, tile, and other parts of structure, with the exception of drilling for hangers and providing holes and openings in metal decks. The Electrical Subcontractor shall identify locations of penetrations, excavations, structural supports, etc. required for the completion of the Work of this Section to the General Contractor in a timely manner.

D. Installation of access panels in ceilings and wall construction.

E. Painting, except as specified herein.

F. Temporary water, heat, gas and sanitary facilities for use during construction and testing.

G. Outdoor air intake or exhaust louvers.

H. Cathodic anti-corrosion protection for buried piping and tanks.

I. Control wiring specifically indicated as part of Division 15.

2.4 General Equipment and Materials Requirements

2.4.1 General Requirements

All equipment and materials shall be new and of the quality specified. All materials shall be free from defects at the time of installation. Materials or equipment damaged in shipment or otherwise damaged during construction shall not be repaired at the jobsite, but shall be replaced with new materials.

2.4.2 Representation of Equipment

All equipment installed on this project shall have local representation, local factory authorized service and a local stock of repair parts.

2.4.3 Warranties

No equipment or material shall be installed in such a manner as to void a manufacturer’s warranty. The Electrical Subcontractor shall notify the Engineer of any discrepancies between the Contract Documents and manufacturer's recommendations prior to execution of the work. Refer to Division 1, General Requirements for Warranty Requirements.

2.5 Shop Drawings

2.5.1 General Requirements

After the Contract is awarded, but prior to proceeding with the Work, the Electrical Subcontractor shall obtain complete shop drawings, product data and samples from manufacturers, suppliers, vendors, and Subcontractors for all materials and equipment specified herein, and submit data and details of such materials and equipment for review by the Engineer. Submission of such items shall follow the guidelines set in the General Section of the Specification Document. Prior to submission of the shop drawings, product data and samples to the Engineer, the Electrical Subcontractor shall review and certify that the shop drawings, product data and samples are in compliance with the Contract Documents. Further, the Electrical Subcontractor shall check all materials and equipment after their arrival on the jobsite and verify their compliance with the Contract Documents. A minimum period of ten working days, exclusive of transmittal time will be required in the Engineer's office each time shop

drawings, product data and/or samples are submitted or resubmitted for review. This time period shall be considered by the Electrical Subcontractor when scheduling his Work.

2.5.2 Information to be included in Submittal

The shop drawing submittal shall include all data necessary for interpretation as well as manufacturer's name and catalog number. Sizes, capacities, colors, etc., specified on the drawings shall be specifically noted or marked on the shop drawings.

2.5.3 Information Not to be included in Submittal

Submittals shall contain only information specific to systems, equipment and materials required by Contract Documents for this Project. Do not submit catalogs that describe products, models, options or accessories, other than those required, unless irrelevant information is marked out or unless relevant information is highlighted clearly. Marks on submittals, whether by Contractor, Subcontractor, manufacturer, etc., shall not be made in red ink. Red is reserved for review process.

2.5.4 Responsibility of Submitted Equipment

The Engineer's review of such drawings shall not relieve the Subcontractor of responsibility for deviations from the Contract, Drawings or Specifications, unless he has in writing called the attention of the Engineer to such deviations at the time of the submission. The Engineer's review shall not relieve the Electrical Subcontractor from responsibility for errors or omissions in such drawings.

2.5.5 Proposal of Other Equipment

If the Electrical Subcontractor proposes an item of equipment other than that specified or detailed on the drawings which requires any redesign of the wiring or any other part of the mechanical, electrical or architectural layout, the required changes shall be made at the expense of the trade furnishing the changed equipment at no cost to the Owner.

2.5.6 Substitution of Equipment of Equal Quality

Manufacturer's names are listed herein and on the drawings to establish a standard for quality and design. Where one manufacturer's name is mentioned, products of other manufacturers will be acceptable if, in the opinion of the Engineer the substitute material is of quality equal to or better than that of the material specified. Where two or more manufacturer's names are specified, material shall be by one of the named manufacturers only.

2.6 Equipment Manuals

2.6.1 General Requirements

The Electrical Subcontractor shall provide three copies of operations and maintenance manuals for all items. These manuals shall be packaged with additional information including equipment cur sheets and as-built wiring diagrams. Manuals shall contain names and addresses of manufacturers and local representatives who stock or furnish repair parts for items or equipment.

2.6.2 Schedule

Deliver manuals no less than 30 days prior to acceptance of equipment to permit Owner's personnel to become familiar with equipment and operation prior to acceptance.

2.6.3 Instruction of Owner's Operating Personnel

Upon completion of installation or when Owner accepts portions of building and equipment for operational use, instruct the Owner's operating personnel in any and all parts of various systems. Such instructions shall cover period of control such as will take mechanical equipment through complete cycle. Make adjustments under actual operating conditions.

2.7 Record Drawings

2.7.1 General Requirements

As work progresses, and for duration of the Contract, the Electrical Subcontractor shall maintain a complete and separate set of prints of Contract Drawings at job site at all times and record work completed and all changes from original Contract. Drawings shall clearly and accurately include work installed as a modification or added to the original design. At completion of work and prior to final request for payment, the Electrical Subcontractor shall submit a complete set of reproducible record drawings showing all systems as actually installed.

2.8 Equipment Specifications

2.8.1 Panelboards

The intent is to reuse all existing panelboards, supplementing with new circuit breakers as shown on the drawings. Circuit Breakers shall be trip-free molded case, bolt-on, thermal magnetic circuit breakers, rated for use in the existing panel board. KAIC ratings shall match that of other breakers in the existing panelboard.

2.8.2 Grounding System:

A green equipment grounding conductor shall be run with each branch circuit. Grounding conductors shall be soft drawn bare copper.

2.8.3 Feeder and Branch Circuit Wiring:

A. Provide feeder and branch circuits and devices for power to equipment and convenience receptacles. This includes branch wiring to system control panels furnished under other sections.

B. All circuits feeding panels, circuit feeders and circuit wiring shall be copper, minimum size #12 AWG. Conductors shall be 600V rated with THHN/THWN insulation.

D. All exposed wiring shall be in EMT conduit. Wiring above acoustic ceiling tiles may be in conduit or as part of an MC cable assembly.

E. EMT Conduit fittings shall be steel set-screw type in dry locations and compression type for wet or damp locations. Terminations for all EMT conduits shall use insulated bushings or insulated throat connectors in accordance with NEC requirements. All conduits shall be properly supported with hangers or clips at a spacing not to exceed 10 feet. Minimum conduit size is ¾".

F. Flexible metal conduit shall be used for connections to vibrating equipment.

G. Liquid-Tight flexible metal conduit shall be used for connections to vibrating equipment in wet or damp locations. Liquid tight shall not penetrate the roof or exterior walls and shall not be used in lengths exceeding 36".

H. All conduits or penetrations in fire rated walls shall be furnished with fire stopping material to maintain the integrity of the rating.

I. All conduits penetrating the roof or exterior walls shall be furnished with watertight seals.

2.8.4 Motor Circuit Wiring: Provide all motor wiring, safety disconnects, and motor starters unless integral with equipment.

A. Safety Switches: Shall be fused or non-fused as required by code. Construction shall be heavy-duty horsepower rated type. Enclosure shall be NEMA 1 where installed indoors and Nema 3R where installed outdoors.

B. Manual motor starters: Shall be Single phase fractional HP manual motor starters shall be toggle operated, enclosed, one or two pole switches as required by the installation. The enclosure shall be NEMA 1 for indoor locations and NEMA 4 for outdoor, wet and damp locations. A handle guard shall be provided to allow the toggle operator to be padlocked in the OFF position. Starters shall be provided with trip free melting alloy thermal overloads.

2.8.5 Lighting Systems:

A. Light fixtures shall be provided with housings, trims, ballasts, lamps, lamp holders, sockets, reflectors, wiring and other components required, as a factory-assembled unit for a complete installation. Provide electrical wiring within light fixtures suitable for connecting to branch circuit wiring in accordance with N.E.C. Article 410, Paragraph 25. Provide fluorescent fixtures of sizes, types and ratings indicated and specified in the Lighting Fixture Schedule on the Contract Drawings.

B. Contractor shall communicate with and provide all rebate worksheets and corresponding equipment cut sheets to Efficiency Maine for approval prior to ordering the fixtures to ensure that the Owner can receive the full value of the rebate for providing high efficiency fixtures and approved lamp/ballast combinations.

C. Occupancy Sensors: Occupancy sensors of the type and model specified on the drawings shall be provided, installed and wired into the local lighting circuit in the area that the sensors are installed. The engineer will consider equipment of another equal manufacturer, where suitable coverage can be documented.

- Passive Infrared Wall-Mount Fixtures: Wall mounted occupancy sensors shall be suitable for dual circuit operation as specified on the contract drawings.
- Ultrasonic/Infrared Ceiling-Mounted Sensors: Ceiling mounted occupancy sensors shall be self-calibrating type as specified on the contract drawings.
- Power Packs: Power packs shall be provided as required for each room provided with occupancy sensors as needed.

- Slave Relay Packs: Slave relay packs shall be provided in rooms with more than one lighting circuit controlled by the occupancy sensor.
- Installation Requirements: Provide all miscellaneous equipment and wiring for a complete installation.

PART THREE: EXECUTION

3.1 Wiring Methods

3.1.1 Requirements

Unless otherwise noted all wiring shall be installed in raceway as follows:

A. **Power Distribution Indoors:** Unless otherwise noted, all other power distribution wiring including feeders and branch circuits shall be installed in electrical metallic tubing (EMT) when exposed and MC Cable when concealed.

B. **Telephone & Data:** Shall be installed in EMT from the device box to an accessible area above the hung ceiling. Cables installed above the hung ceiling shall be properly installed in a neat and orderly manner on j-hooks.

C. **Cable Television (CATV):** Shall be installed in EMT from the device box to an accessible area above the hung ceiling. Cables installed above the hung ceiling shall be properly installed in a neat and orderly manner on j-hooks.

D. **Security Systems Wiring:** Shall be installed in EMT from the device box to an accessible area above the hung ceiling. Cables installed above the hung ceiling shall be properly installed in a neat and orderly manner on j-hooks.

3.2 Equipment Arrangement and Access

3.2.1 Location of Equipment

Locate all equipment which must be serviced, operated or maintained in fully accessible positions. Minor deviations from the drawings may be made to allow for better accessibility at no additional cost to the Owner, but changes shall not be made without review by the Engineer. Minimum clearances in front of or around equipment shall conform to the latest applicable code requirements.

3.2.1 Arrangement of Equipment

The size of equipment shown on the drawings is based on the dimensions of a particular manufacturer. Where other manufacturers are acceptable, it is the responsibility of the Electrical Subcontractor to determine if the equipment he proposed to furnish will fit the space available. Layout drawings shall be prepared by the Subcontractor when required by the Engineer or Owner to indicate a suitable arrangement.

3.3 Equipment Labeling

3.3.1 Panelboards

All panelboards, indoor transformers, cabinets and other specified equipment shall be labeled with engraved laminated plastic plates, minimum 3/4" high with 3/8" engraved letters. Punch tapes with mastic backings are not acceptable.

3.3.2 Starters and Disconnect Switches

All starters, disconnect switches and other specified equipment shall be marked with engraved laminated plastic plates, minimum 1/2" high with 1/4" engraved letters. Where individual switches or circuit breakers in power or distribution panelboards do not have cardholders, they shall be marked with 1/2" high labels.

3.3.3 Empty Conduits

All empty conduits shall have labels tied to the pull string at each end of each empty conduit, marked as to identification of each end. Junction boxes with circuits provided for future use shall be labeled with appropriate circuit designation.

3.4.4 Panelboard Directories

Cardholders for panelboards shall be filled out with typewritten identification of each circuit, except that the word "spare" shall be written in soft pencil to identify all circuit breakers installed that are not used.

3.4 Temporary Light and Power

3.4.1 Requirements

The Electrical Subcontractor shall provide a temporary service to the space in the building as required to provide electric light and power while the space is under construction and until the permanent feeders have been installed, tested and accepted by the Owner. The Electrical Subcontractor shall furnish, install and remove the temporary electrical power and lighting systems and pay for all labor, materials, and equipment required therefore. All such temporary electrical work shall meet the requirements of the National Electrical Code, the local utility company, and OSHA. The Electrical Subcontractor shall furnish all lamps, both initial and replacement, used for the temporary lighting system.

3.4.2 Equipment Provided by Others

The General Contractor and all subcontractors, individually, shall furnish all extension cords, portable lights and lamps therefore, sockets, motors, and accessories as required for their work.

3.4.3 Reimbursable Items

The General Contractor and all subcontractors shall reimburse the Electrical Subcontractor for the following:

A. Any temporary wiring of a special nature, other than that specified above, required for their work.

B. Any temporary wiring of construction offices and buildings used by them, other than the office of the General Contractor and the Clerk of the Works.

3.4.4 Removal of Equipment and Wiring

All temporary wiring, service equipment, and accessories thereto shall be removed by the Electrical Subcontractor when directed by the General Contractor.

END OF SECTION 26 00 00

Portland High School
Health Clinic

Portland, Maine

APRIL 24, 2013

DESIGN TEAM

ARCHITECT:

Winton Scott Architects
5 Milk Street
Portland, Maine 04101
207 774 4811
www.wintonscott.com

MECHANICAL/PLUMBING:

Mechanical Systems Engineers
Royal River Center Unit #10
10 Forest Falls Drive, Yarmouth, Maine 04096
207.846.1441 | mechsyst@maine.rr.com

ELECTRICAL:

Swift Current Engineering
273 Main Street, Yarmouth, Maine 04096
207.847.9280 | www.swiftcurrenteng.com

DRAWING LIST

ARCHITECTURAL

D 101	REMOVALS PLAN
A 101	NEW CONSTRUCTION PLAN
A 201	REFLECTED CEILING PLAN
A 301	INTERIOR ELEVATIONS & MILLWORK DETAILS
A 401	DOOR SCHEDULE & DETAILS, FINISH SCHEDULE & PARTITION TYPES

PLUMBING

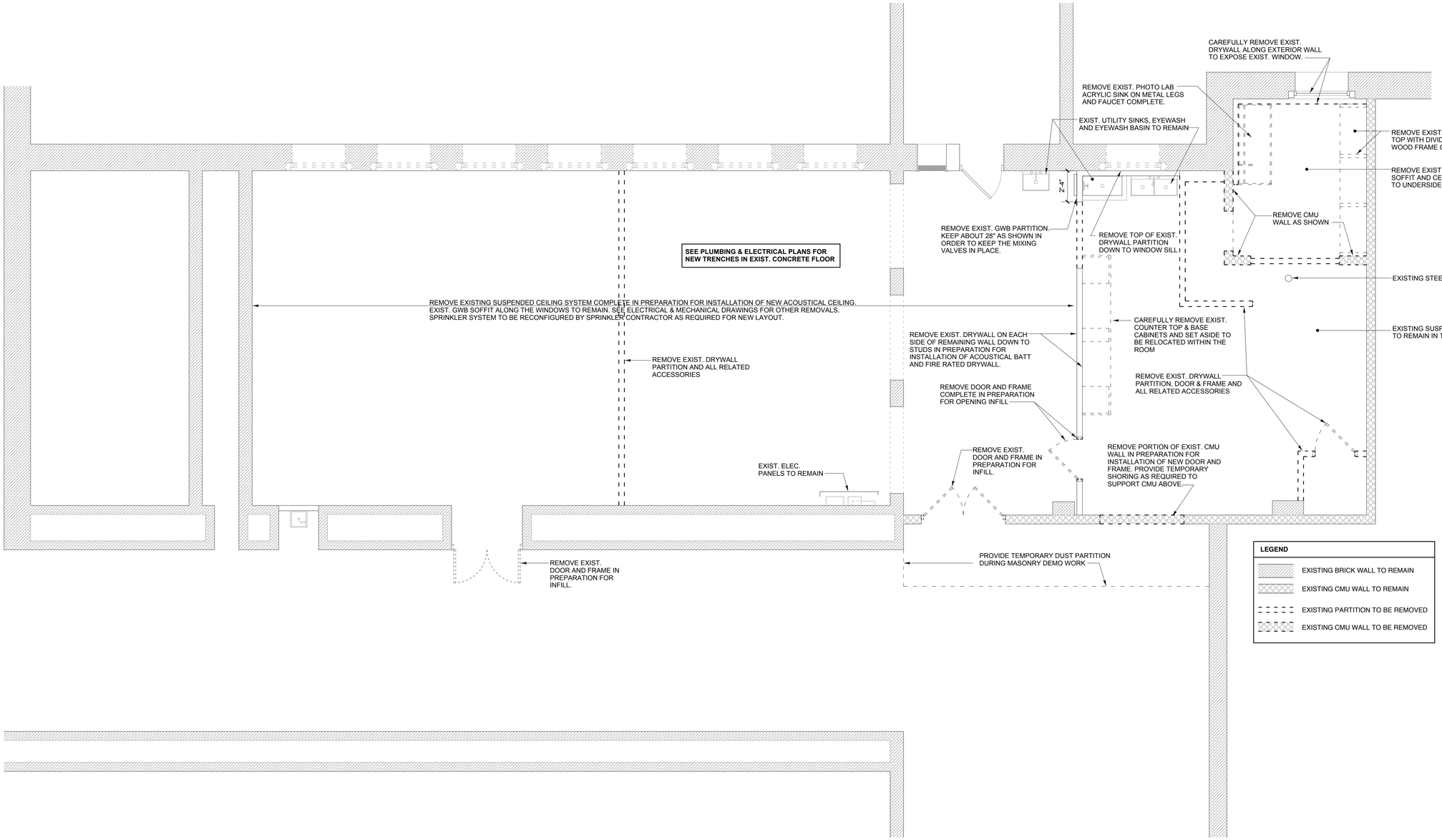
P1	PLUMBING PLAN
P2	PLUMBING SCHEDULES

MECHANICAL

MD1	MECHANICAL DEMOLITION PLAN
M1	MECHANICAL DUCTWORK & PIPING PLANS
M2	MECHANICAL DETAILS & EQUIPMENT SCHEDULES

ELECTRICAL

ED 101	ELECTRICAL DEMOLITION PLAN
E 101	ELECTRICAL POWER & SYSTEMS LAYOUT
E 201	ELECTRICAL FIXTURE LIGHTING & FIRE ALARM LAYOUT



REMOVALS PLAN

1/4" = 1'-0"

Winton Scott Architects
5 Milk Street
Portland, Maine 04101
207 774 4811
www.wintonscott.com

Architecture / Planning
Preservation Architecture
Interior Architecture

Portland High School Health Clinic

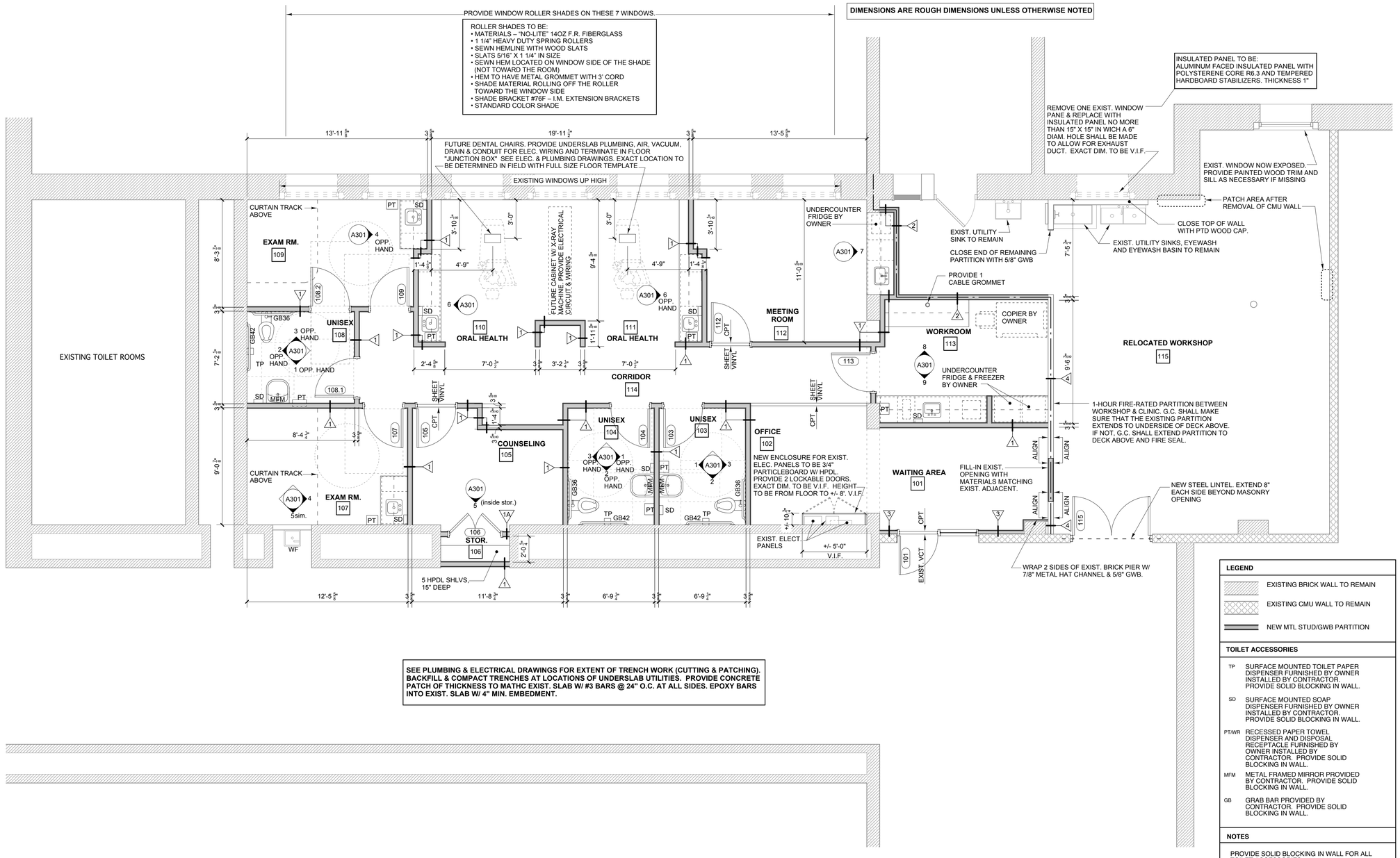
284 Cumberland Ave.
Portland, Maine

BID SET
April 24, 2013

Removals Plan

1/4" = 1' - 0"

D 101



NEW CONSTRUCTION PLAN

1/4" = 1'-0"

Winton Scott Architects
5 Milk Street
Portland, Maine 04101
207 774 4811
www.wintonscott.com

Architecture / Planning
Preservation Architecture
Interior Architecture

Portland High School Health Clinic

284 Cumberland Ave.
Portland, Maine

BID SET
April 24, 2013

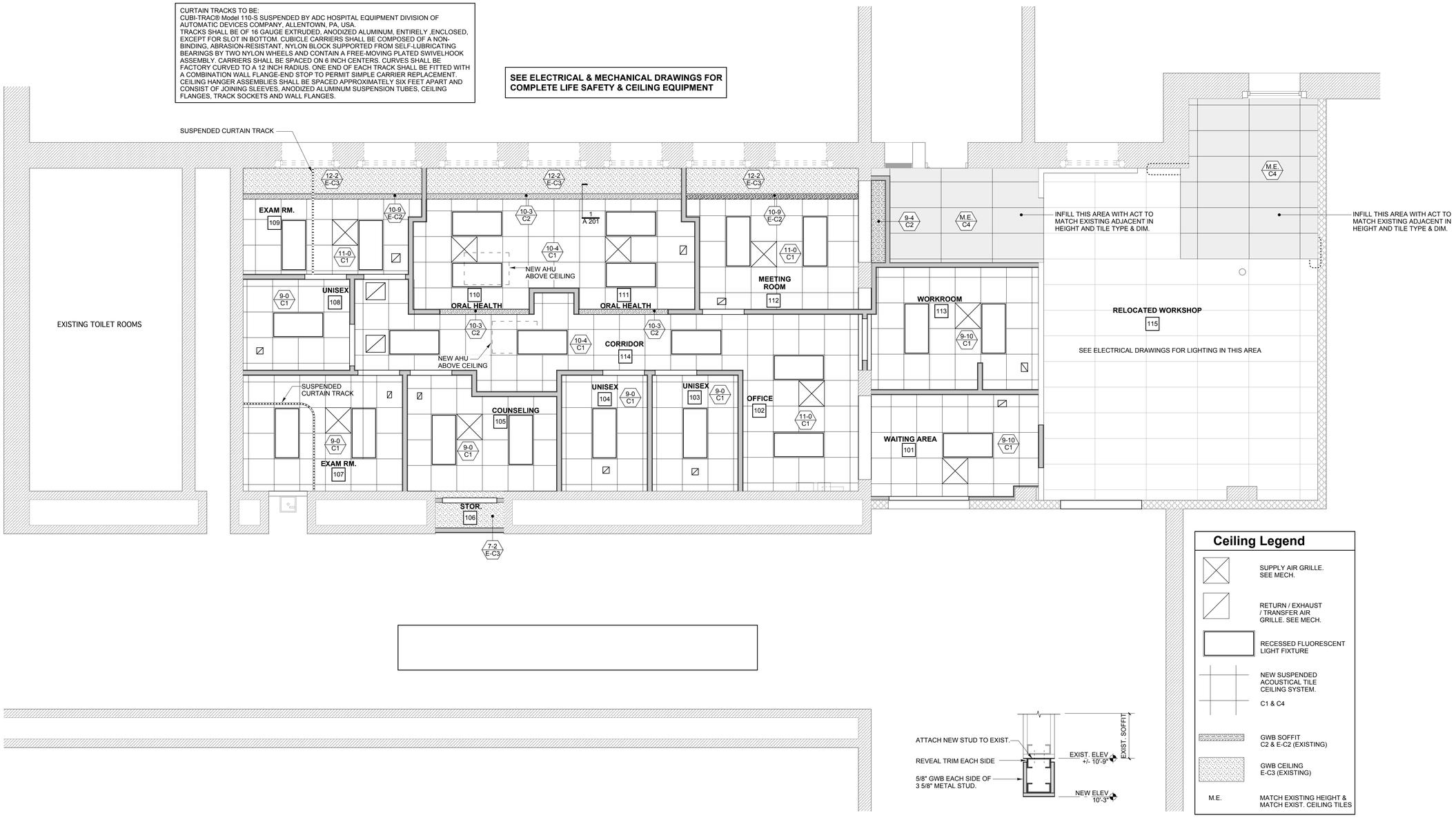
New Construction Plan

1/4" = 1' - 0"

A 101

CURTAIN TRACKS TO BE:
CUBI-TRAC® Model 110-S SUSPENDED BY ADC HOSPITAL EQUIPMENT DIVISION OF AUTOMATIC DEVICES COMPANY, ALLENTOWN, PA, USA.
TRACKS SHALL BE OF 16 GAUGE EXTRUDED, ANODIZED ALUMINUM, ENTIRELY ,ENCLOSED, EXCEPT FOR SLOT IN BOTTOM. CUBICLE CARRIERS SHALL BE COMPOSED OF A NON-BINDING, ABRASION-RESISTANT, NYLON BLOCK SUPPORTED FROM SELF-LUBRICATING BEARINGS BY TWO NYLON WHEELS AND CONTAIN A FREE-MOVING PLATED SWIVELHOOK ASSEMBLY. CARRIERS SHALL BE SPACED ON 6 INCH CENTERS. CURVES SHALL BE FACTORY CURVED TO A 12 INCH RADIUS. ONE END OF EACH TRACK SHALL BE FITTED WITH A COMBINATION WALL FLANGE-END STOP TO PERMIT SIMPLE CARRIER REPLACEMENT. CEILING HANGER ASSEMBLIES SHALL BE SPACED APPROXIMATELY SIX FEET APART AND CONSIST OF JOINING SLEEVES, ANODIZED ALUMINUM SUSPENSION TUBES, CEILING FLANGES, TRACK SOCKETS AND WALL FLANGES.

SEE ELECTRICAL & MECHANICAL DRAWINGS FOR COMPLETE LIFE SAFETY & CEILING EQUIPMENT



Ceiling Legend

- SUPPLY AIR GRILLE. SEE MECH.
- RETURN / EXHAUST / TRANSFER AIR GRILLE. SEE MECH.
- RECESSED FLUORESCENT LIGHT FIXTURE
- NEW SUSPENDED ACOUSTICAL TILE CEILING SYSTEM. C1 & C4
- GWB SOFFIT C2 & E-C2 (EXISTING)
- GWB CEILING E-C3 (EXISTING)
- M.E. — MATCH EXISTING HEIGHT & MATCH EXIST. CEILING TILES

1 **SOFFIT DETAIL**
1 1/2"= 1'-0"

REFLECTED CEILING PLAN

1/4" = 1'-0"

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Architecture / Planning
Preservation Architecture
Interior Architecture

Portland High School Health Clinic

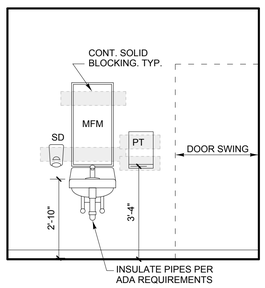
284 Cumberland Ave.
Portland, Maine

BID SET
April 24, 2013

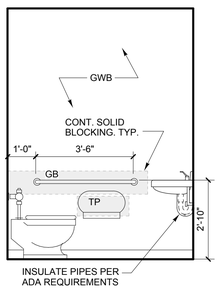
Reflected Ceiling Plan

1/4" = 1' - 0"

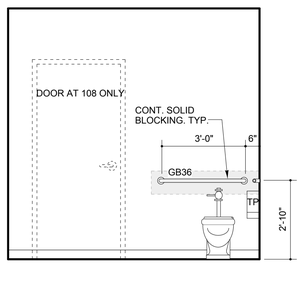
A 201



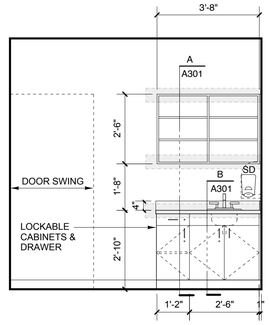
1 **UNISEX BATHROOM 103**
3/8" = 1' - 0"
OPP. HAND & SIM AT 104 & 108



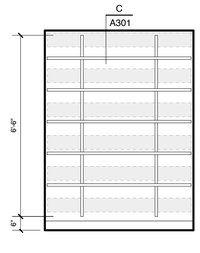
2 **UNISEX BATHROOM 103**
3/8" = 1' - 0"
OPP. HAND AT 104 & 108



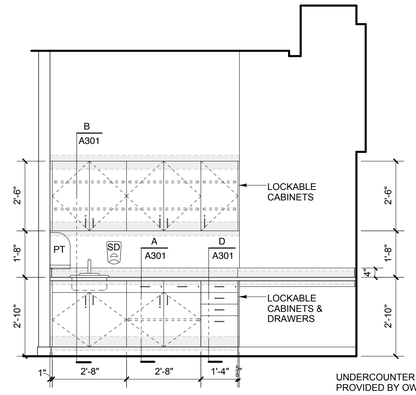
3 **UNISEX BATHROOM 103**
3/8" = 1' - 0"
OPP. HAND AT 104
OPP. HAND & SIM. AT 108



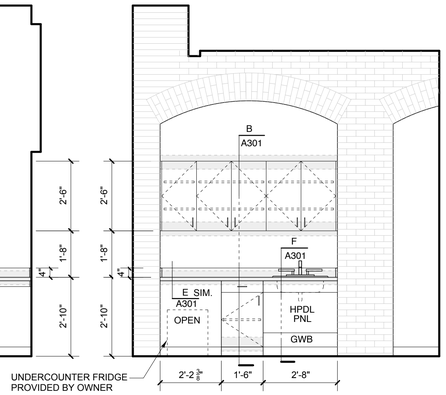
4 **TYPICAL EXAM ROOM CABINET (107 SHOWN)**
3/8" = 1' - 0"
OPP. HAND & SIM. AT 109



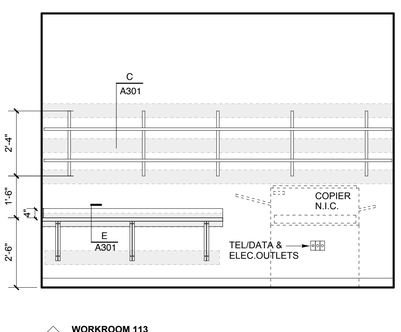
5 **STORAGE 106**
3/8" = 1' - 0"



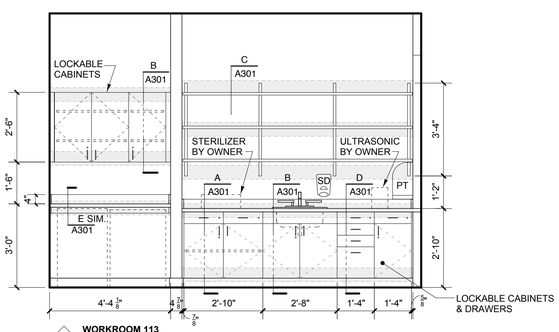
6 **ORAL HEALTH 110**
3/8" = 1' - 0"
OPP. HAND AT 11



7 **MEETING ROOM 112**
3/8" = 1' - 0"



8 **WORKROOM 113**
3/8" = 1' - 0"



9 **WORKROOM 113**
3/8" = 1' - 0"

TOILET ACCESSORIES

TP	SURFACE MOUNTED TOILET PAPER DISPENSER FURNISHED BY OWNER INSTALLED BY CONTRACTOR. **PROVIDE & COORDINATE SOLID BLOCKING IN WALL.**
SD	SURFACE MOUNTED SOAP DISPENSER FURNISHED BY OWNER INSTALLED BY CONTRACTOR. **PROVIDE & COORDINATE SOLID BLOCKING IN WALL.**
PT	PAPER TOWEL DISPENSER AND FURNISHED BY OWNER INSTALLED BY CONTRACTOR. **PROVIDE & COORDINATE SOLID BLOCKING IN WALL.**
MFM	METAL FRAMED MIRROR PROVIDED BY CONTRACTOR. PROVIDE SOLID BLOCKING IN WALL.
GB	GRAB BAR PROVIDED BY CONTRACTOR. PROVIDE SOLID BLOCKING IN WALL.

NOTES

PROVIDE SOLID BLOCKING IN WALL FOR ALL TOILET ACCESSORIES. REFER TO PLANS & ELEVATIONS FOR LOCATIONS OF ALL ACCESSORIES.

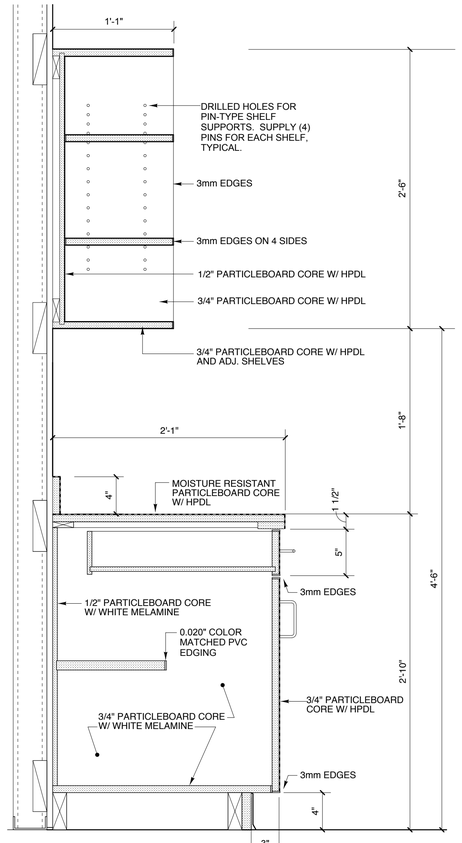
COORDINATE EXACT LOCATIONS WITH ARCHITECT.

PROVIDE SOLID BLOCKING IN WALL FOR ALL SHELVING AND MILLWORK.

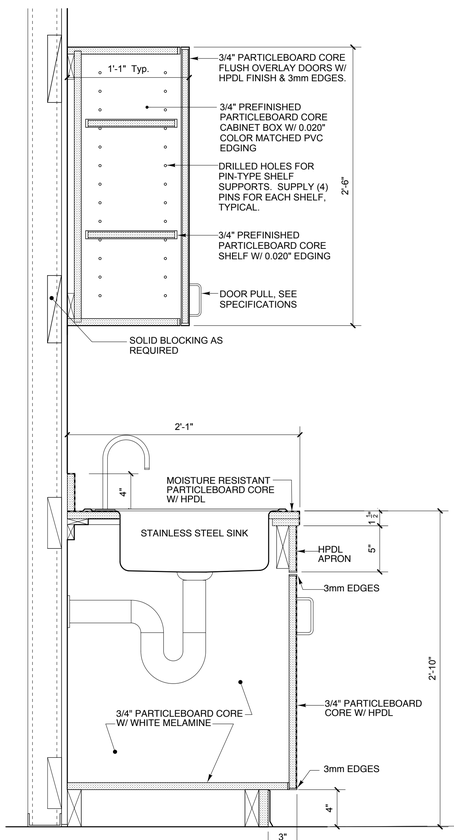
COORDINATE ELECTRICAL & TEL/DATA OUTLETS W/ ELECTRICAL DRAWINGS.

ALL CLOSED CABINETS SHALL BE LOCKABLE EXCEPT THE ONES IN MEETING ROOM 112.

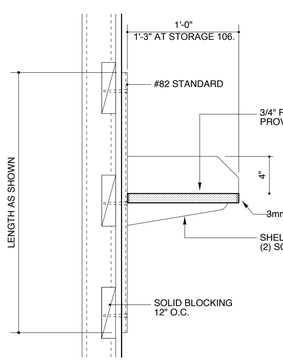
SEMI-EXPOSED CABINET INTERIORS TO BE FINISHED WITH WHITE MELAMINE.



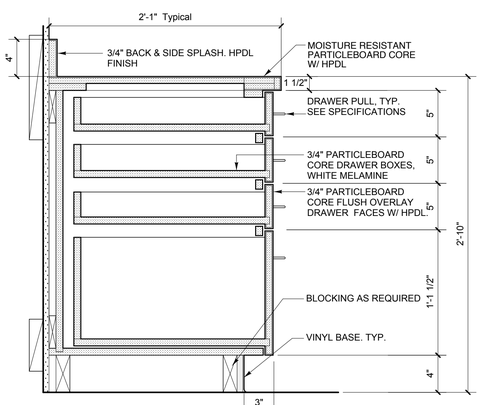
A **BASE AND WALL CABINET**
1 1/2"= 1'-0"



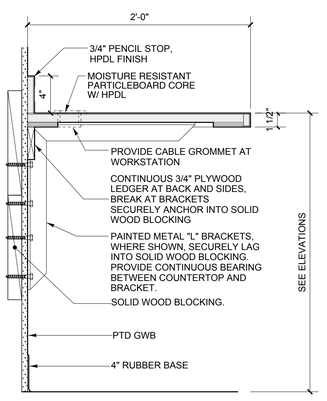
B **SINK BASE CABINET**
1 1/2"= 1'-0"



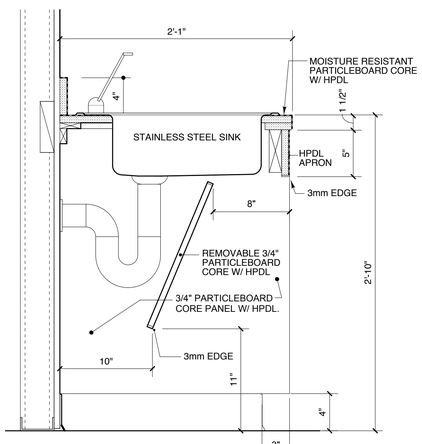
C **ADJUSTABLE WALL SHELVING**
1 1/2"= 1'-0"



D **DRAWER BASE CABINET**
1 1/2"= 1'-0"



E **COUNTER DETAIL W/ BRACKETS**
1 1/2"= 1'-0"



F **COUNTER SECTION AT SINK**
1 1/2"= 1'-0"

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Preservation Architecture
Interior Architecture

Portland High School Health Clinic

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Portland, Maine

BID SET
April 24, 2013

Interior Elevations & Millwork details

Scale as indicated

A 301

DOOR & FRAME SCHEDULE

General			Door			Frame			Details			Hardware														
												Hinges	Silencers	Wall Stop	Overhead Stop/Holder	Lockset: Entrance	Lockset: Classroom	Passage Set	Privacy set	Automatic Door Bottom	Perimeter Sound Seal				
Door No.	Size (W x H)	Thickness	Material	Finish	Type	Material	Finish	Type	Head	Jamb	Threshold													Label	Remarks
101	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D1	HM	Ptd	F1	H2	J2		●	●		●		●							--	NEW DR & FR. IN EXIST. OPENING
103	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●					●					--	
104	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●					●					--	
105	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●				●		●	●			--	
106	PAIR 2'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●		●									--	PROVIDE DUMMY LEVER SET & MAGNETIC CATCH ON EACH DOOR
107	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●				●						--	
108.1	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●					●					--	
108.2	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●		●				●					--	
109	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●				●						--	
112	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●				●						--	
113	3'-0" x 7'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●			●							--	
115	PR 3'-0" x 8'-0"	1 3/4"	WH BIRCH	NAT.	D2	HM	Ptd	F2	H1	J1		●	●	●			●							--	

FINISH SCHEDULE

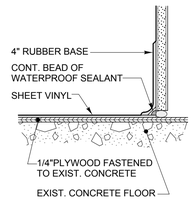
Room Name	Floor	Base	Walls	Remarks
Waiting Area 101	Carpet	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Office 102	Carpet	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Unisex Bathroom 103	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Unisex Bathroom 104	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Counseling 105	Carpet	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Storage 106	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Exam Room 107	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Unisex Bathroom 108	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Exam Room 109	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Oral Health 110	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Oral Health 111	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Meeting Room 112	Carpet	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Work Room 113	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Corridor 114	Sheet Vinyl	4" rubber	Ptd GWB / Ptd Brick	NOTE 1
Relocated Workshop 115	Concrete	4" rubber	Ptd GWB / Ptd Brick	NOTE 2

FINISH KEY NOTES

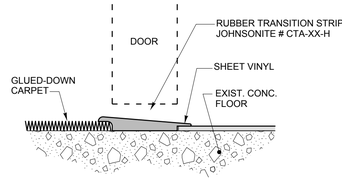
1- Prepare existing painted brick wall (clean, brush, remove loose debris, etc) in preparation to receive new paint.

2- Install rubber base on new walls. Existing base on existing walls to remain. Patch floor & base as necessary where walls have been removed. Paint all remaining brick, CMU and GWB walls. Concrete floor to be broom cleaned. THIS NOTE PERTAINS TO THE WORKSHOP ONLY.

FINISH DETAILS



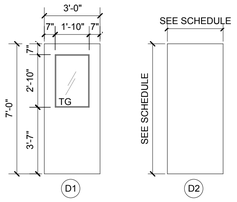
A RUBBER BASE DETAIL AT SHEET VINYL
3"= 1'-0"



B FLOOR TRANSITION DETAIL
6"= 1'-0"

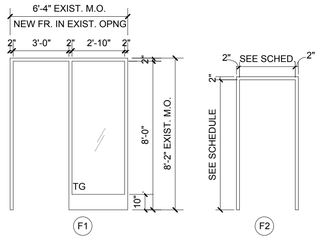
DOOR TYPES

1/4" = 1'-0"

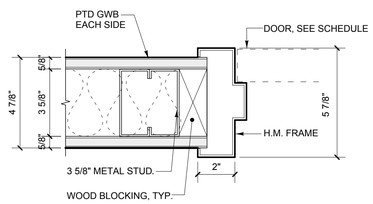


DOOR FRAME TYPES

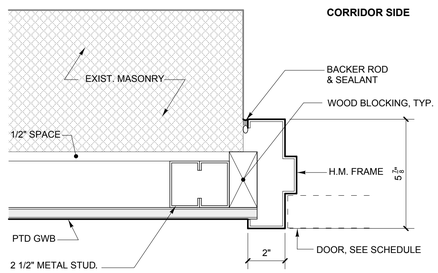
1/4" = 1'-0"



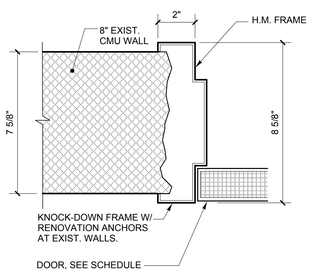
DOOR DETAILS



J1 H1 JAMB DETAIL / HEAD SIMILAR
SCALE: 3" = 1'-0"



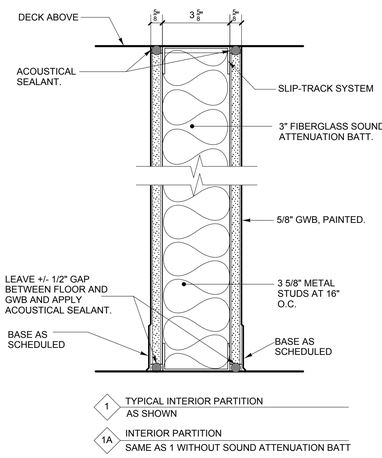
J2 H2 JAMB DETAIL / HEAD SIMILAR
SCALE: 3" = 1'-0"



J3 H3 JAMB DETAIL / HEAD SIMILAR
SCALE: 3" = 1'-0"

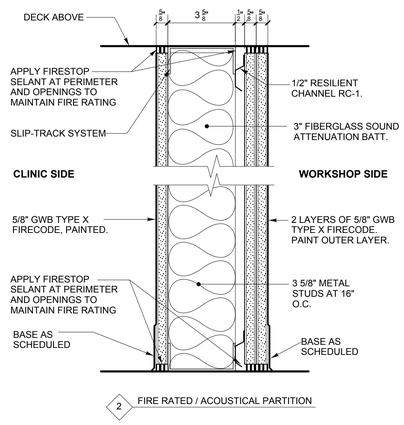
PARTITION TYPES

3" = 1'-0"

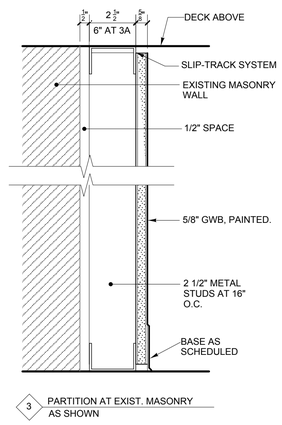


1 TYPICAL INTERIOR PARTITION
AS SHOWN

1A INTERIOR PARTITION
SAME AS 1 WITHOUT SOUND ATTENUATION BATT



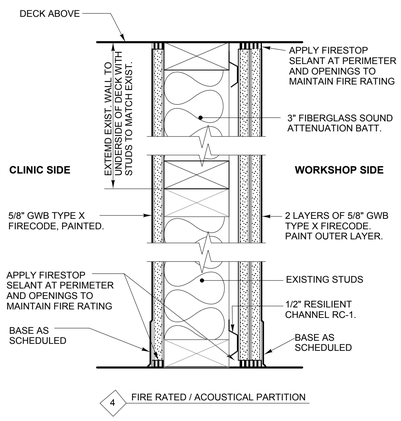
2 FIRE RATED / ACOUSTICAL PARTITION



3 PARTITION AT EXIST. MASONRY
AS SHOWN

3A PARTITION AT EXIST. MASONRY
SAME AS 3 EXCEPT 6" STUDS IN LIEUE OF 2 1/2"

3B PARTITION AT EXIST. MASONRY
SAME AS 3 EXCEPT 1 5/8" STUDS IN LIEUE OF 2 1/2"



4 FIRE RATED / ACOUSTICAL PARTITION

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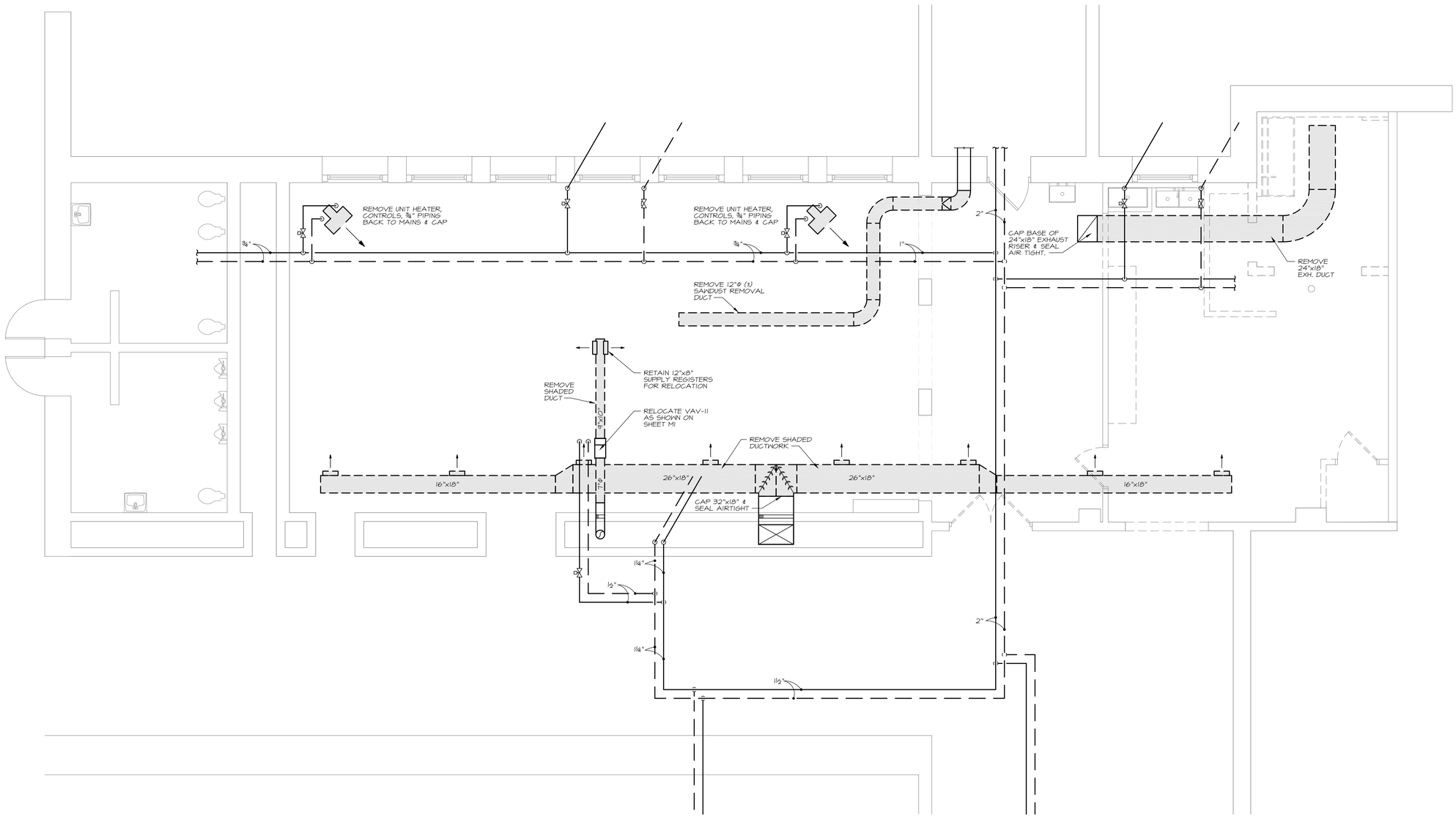
BID SET
April 24, 2013

Door Schedule & Details
Finish Schedule &
Partition Types

Scale as indicated

A 401



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LICENSED PROFESSIONAL ENGINEER

Portland High School Health Center

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BID SET
April 24, 2013

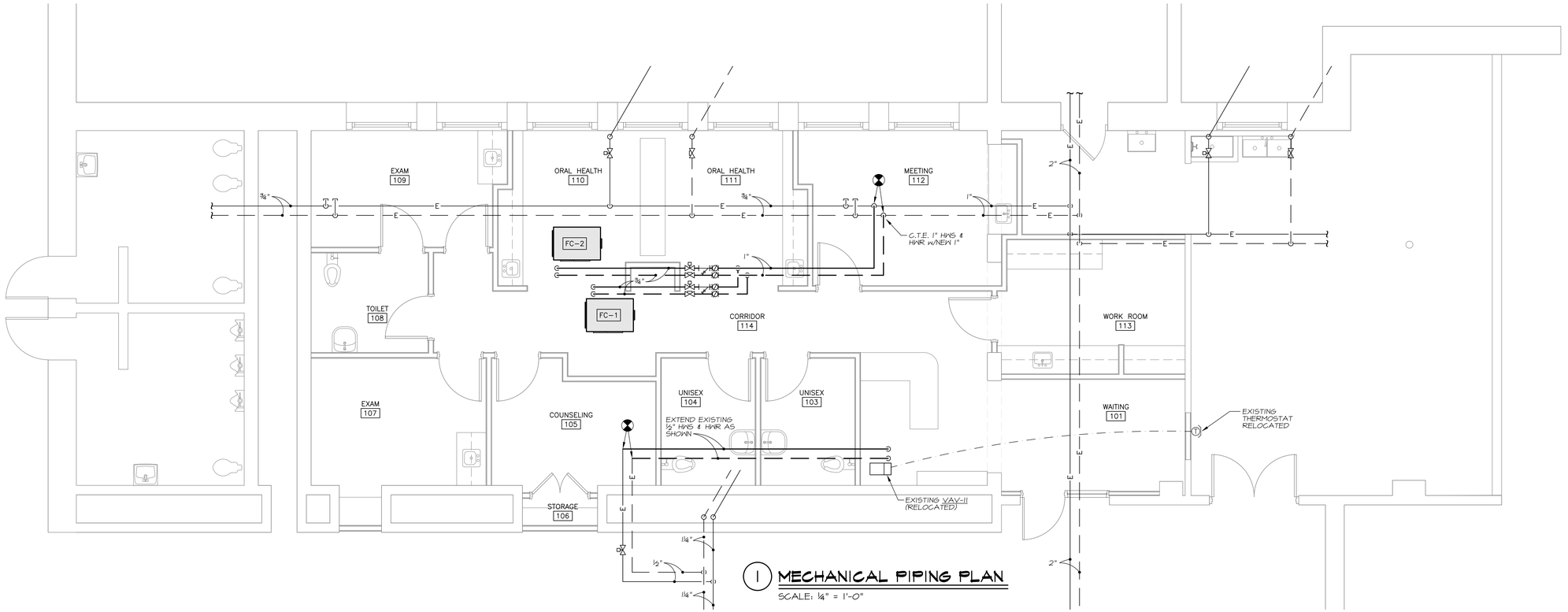
Mechanical Demolition Plan

Scale: 1/4" = 1'-0'

0' 1' 2' 3' 4' 8' 12' 16'
¼" = 1'-0"

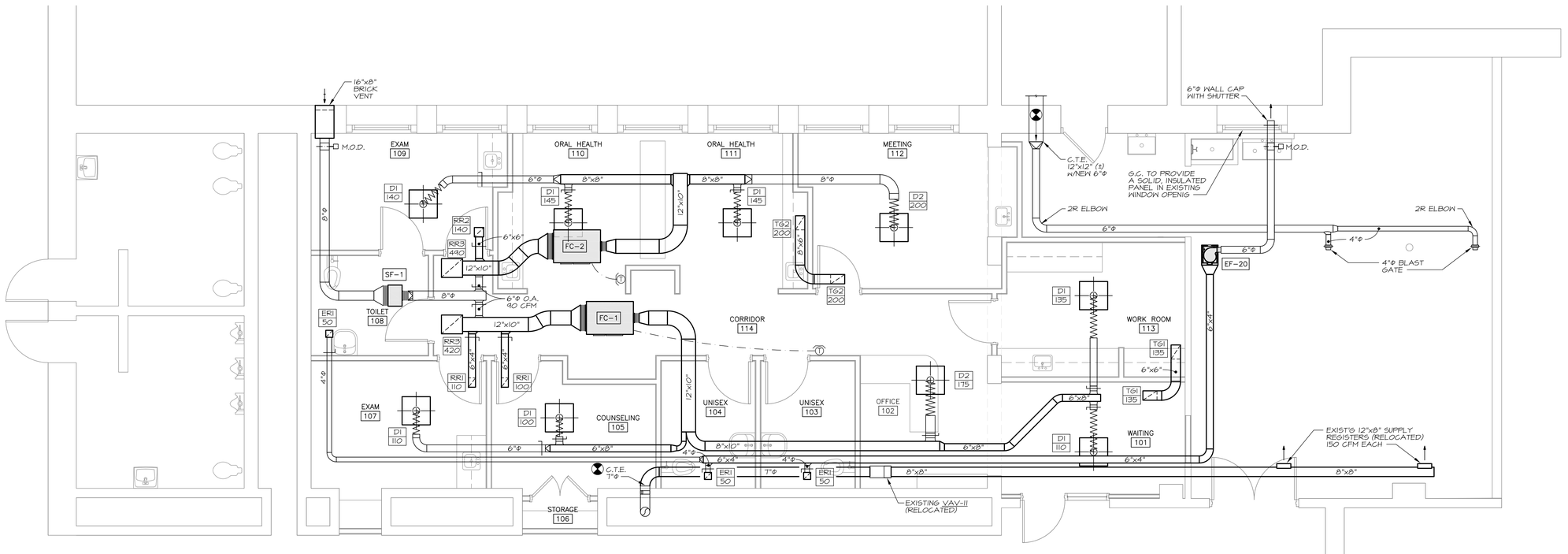
MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT #10
10 FOREST FALLS DRIVE
YARMOUTH, MAINE 04096
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
207-846-1441
M.S.E. Proj. 1310

MD1



1 MECHANICAL PIPING PLAN

SCALE: ¼" = 1'-0"



2 MECHANICAL DUCTWORK PLAN

SCALE: ¼" = 1'-0"

¼" = 1'-0" 0' 1' 2' 3' 4' 8' 12' 16'

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Kurt F. Magnusson 10257
LICENSED PROFESSIONAL ENGINEER

Portland High School Health Center

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Portland, Maine

BID SET
April 24, 2013

Mechanical Ductwork & Piping Plans

Scale: 1/4" = 1'-0"

M1

FAN COIL UNIT SCHEDULE

TAG	AREA SERVED	SUPPLY FAN			ELECTRIC	HEATING COIL								WEIGHT (LBS)	REMARKS
		CFM	ESP	HP		MAX FV	EAT	LAT	EWT	LWT	GPM	MBH	WPD		
FC-1	INTERIOR ZONES	630	0.75"	0.33	120V-60-1P	567	54.0	92.8	180	154.8	2.0	26.45	2.44'	100	HORIZONTAL UNIT / 2" MERV 8 FILTER
FC-2	EXTERIOR ZONES	630	0.75"	0.33	120V-60-1P	567	54.0	92.8	180	154.8	2.0	26.45	2.44'	100	HORIZONTAL UNIT / 2" MERV 8 FILTER

FAN SCHEDULE

TAG	AREA SERVED	TYPE	CFM	SP	SONES	RPM	WATTS	ELECTRIC	WEIGHT	REMARKS
EF-20	TOILETS	IN-LINE	150	3/8"	2.6	1,189	113	120V-60-1P	16	OPERATE FROM ATC SYSTEM
SF-1	OUTDOOR AIR	IN-LINE	180	1/4"	0.6	845	116	120V-60-1P	31	OPERATE FROM ATC SYSTEM

EF-1 THRU 19 ARE EXISTING SONE RATINGS ARE MINIMUMS NOT TO BE EXCEEDED HVI SONE RATINGS WILL NOT BE ACCEPTED

AIR TERMINAL SCHEDULE

TAG	SIZE	MAX CFM	MAX NC	MAX SP	REMARKS
D1	6"	140	20	0.065"	SQUARE DIFFUSER / LAY-IN FRAME
D2	8"	240	20	0.065"	SQUARE DIFFUSER / LAY-IN FRAME
ER1	6" x 6"	80	20	0.070"	EXHAUST REGISTER
RR1	8" x 6"	110	20	0.050"	RETURN REGISTER
RR2	8" x 8"	150	20	0.070"	RETURN REGISTER
RR3	18"x16"	600	20	0.040"	RETURN REGISTER
TG1	12" x 6"	135	20	0.030"	TRANSFER GRILLE
TG2	12"x 8"	240	20	0.030"	TRANSFER GRILLE

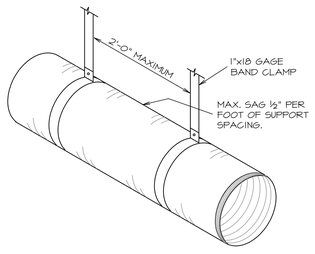
GENERAL NOTES

1. Mechanical Contractor shall coordinate work with al other trades.
2. All piping and ductwork shall be run concealed and on the warm side of building insulation unless shown otherwise.
3. Piping and ductwork is shown diagramatically. Exact locations to be adjusted as required to conform to field conditions.
4. All duct sizes indicated are outside (sheet metal) dimensions.
5. All cutting and patching by the General Contractor.
6. All square duct elbows over 12 inches in width to have turning vanes.
7. Refer to Architectural Reflected Ceiling Plans for exact locations of all ceiling registers, diffusers and grilles.
8. All dimensions associated with existing conditions are approximate and are to be field verified.
9. All reductions in water pipe sizes in the direction of flow shall be accomplished with inverted eccentric reducing fittings. Do not use reducing tees.
10. Provide drains at all low points in the water piping system.
11. All removed materials shall remain the property of the Owner until such time the Owner's authorized representative has reviewed the removed items and taken what the Owner wishes to retain. All remaining items shall become the property of the Contractor and shall be immediately removed from the premesis by the Contractor.

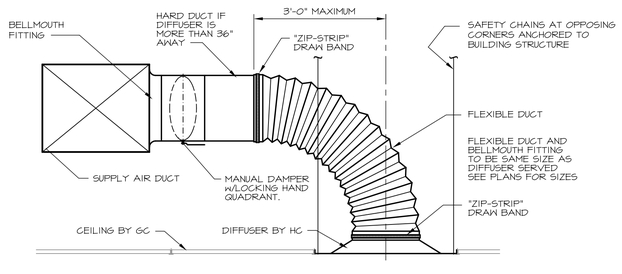
SYMBOLS AND ABBREVIATIONS

ABV	AUTOMATIC BALANCING VALVE
AFF	ABOVE FINISH FLOOR
AP	ACCES PANEL
APD	AIR PRESSURE DROP
ATC	AUTOMATIC TEMP. CONTROL
CFM	CUBIC FEET PER MINUTE
CTE	CONNECT TO EXISTING
CV	CONTROL VALVE
DIFF	DIFFUSER
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
FC	FAN COIL
FV	FACE VELOCITY
GC	GENERAL CONTRACTOR
HC	HEATING CONTRACTOR
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LAT	LEAVING AIR TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MBV	MANUAL BALANCING VALVE
MD	MANUAL DAMPER
MOD	MOTOR OPERATED DAMPER
MV	MANUAL VENT
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OD	OUTSIDE DIMENSION
PC	PLUMBING CONTRACTOR
R	RETURN
RA	RETURN AIR
RR	RETURN REGISTER
S	SUPPLY
SA	SUPPLY AIR
SP	STATIC PRESSURE
SR	SUPPLY REGISTER
TC	TEMPERATURE CONTROL
TG	TRANSFER GRILLE
TSP	TOTAL STATIC PRESSURE
T'STAT	THERMOSTAT
UC	UNDERCUT
UH	UNIT HEATER
VAV	VARIABLE AIR VOLUME
VI	VIBRATION ISOLATOR
WPD	WATER PRESSURE DROP
WTD	WATER TEMPERATURE DROP

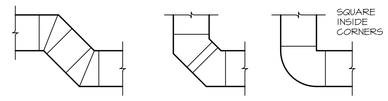
WATER SUPPLY PIPING
WATER RETURN PIPING
E — EXISTING PIPING
UNION
CHECK VALVE
BALANCING VALVE
CONTROL VALVE (TWO WAY)
BALL VALVE
STRAINER
THERMOSTAT
THERMOSTAT WITH GUARD
CONNECT TO EXISTING
MANUAL DAMPER
FLEXIBLE DUCT
LAY-IN DIFFUSER
SUPPLY AIR DUCT
RETURN / RELIEF AIR DUCT



1 FLEXIBLE DUCT SUPPORT DETAIL
NO SCALE



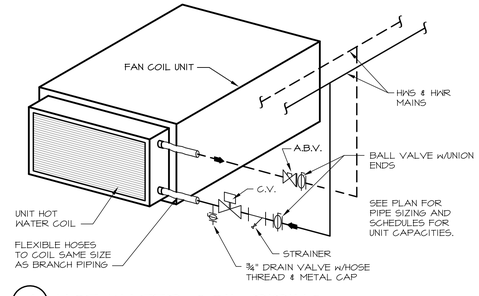
2 FLEXIBLE DUCT & DIFFUSER CONNECTION DETAIL
NO SCALE



USE SMOOTH RADIUS ELBOWS ONLY

THESE TYPES OF FITTINGS ARE UNACCEPTABLE UNLESS SPECIFICALLY INDICATED OTHERWISE.

3 UNACCEPTABLE DUCT FITTINGS
NO SCALE



4 HOT WATER COIL PIPING
NO SCALE

0' 1' 2' 3' 4' 8' 12' 16'
¼" = 1'-0"

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Kurt F. Magnusson
10257
PROFESSIONAL ENGINEER

Portland
High School
Health Center

284 Cumberland Ave.
Portland, Maine

BID SET
April 24, 2013

Mechanical Details & Equipment Schedules

Scale: Noted

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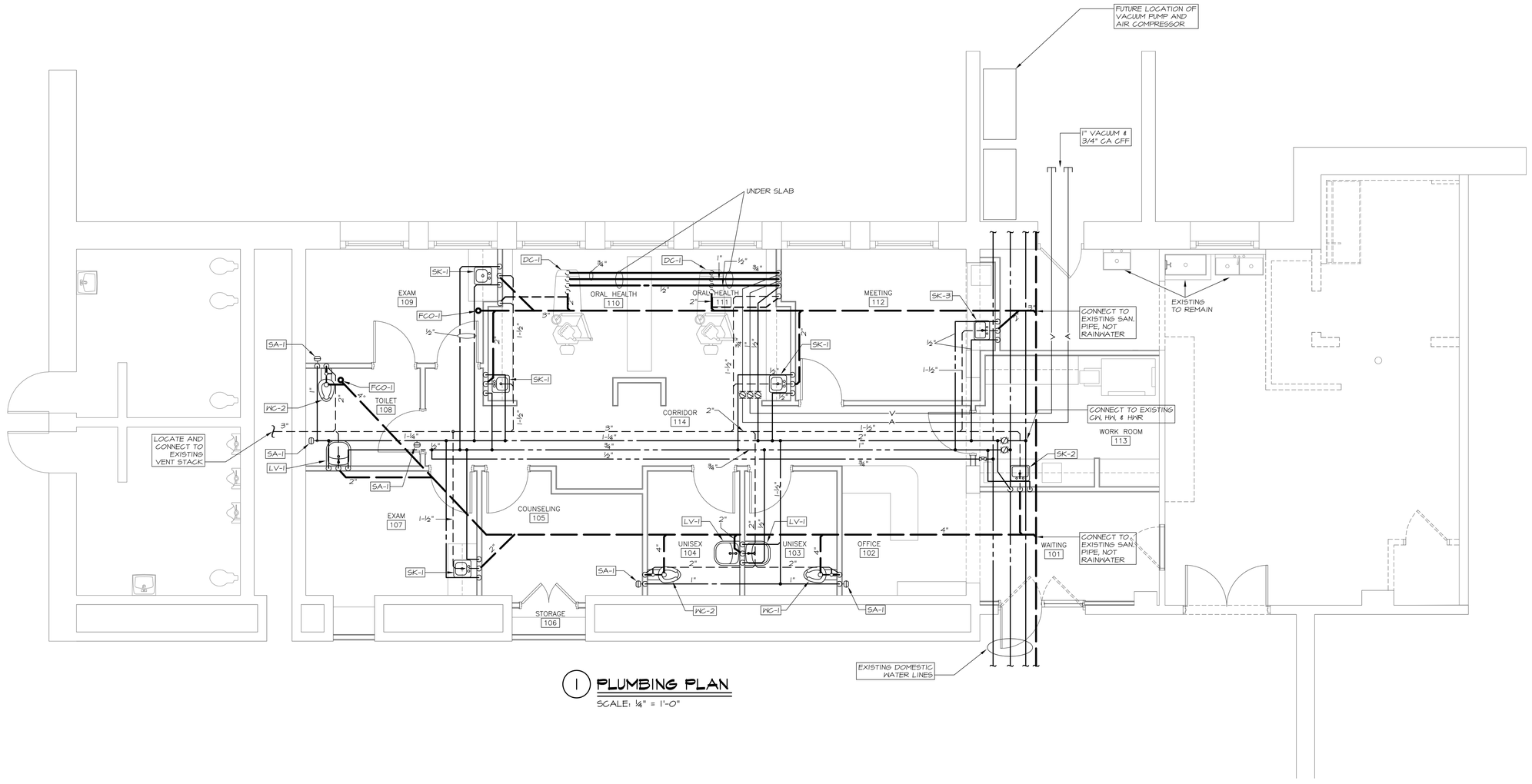
M2



1 PLUMBING PLAN

SCALE: ¼" = 1'-0"

¼" = 1'-0"

0' 1' 2' 3' 4' 8' 12' 16'

MECHANICAL SYSTEMS ENGINEERS
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REGISTERED PROFESSIONAL ENGINEER

Portland High School Health Center

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BID SET
April 24, 2013

Plumbing Plan

Scale: 1/4" = 1'-0"

P1

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BLV	BALL VALVE
CHV	CHECK VALVE
CNTR	COUNTER
CW	COLD WATER
C&HW	COLD & HOT WATER
DAW	DROP AT WALL
DIW	DROP IN WALL
DN	DOWN
DNAW	DOWN AT WALL
DNIW	DOWN IN WALL
GC	GENERAL CONTRACTOR
GHT	GARDEN HOSE THREAD
GPF	GALLONS PER FLUSH
HB	HOSE BIB
HC	HEATING CONTRACTOR
HW	HOT WATER
IE	INVERT ELEVATION
IDW	INDIRECT WASTE
LV	LAVATORY
MTD	MOUNTED
OFC	OFFSET FOR CLARITY
PC	PLUMBING CONTRACTOR
PDI	PLUMBING & DRAINAGE INSTITUTE
RAW	RISE AT WALL
RH	RIGHT HAND
RIW	RISE IN WALL
RUC	RUN UNDER COUNTER
S	SANITARY WASTE
SA	SHOCK ABSORBER
SK	SINK
SS	STAINLESS STEEL
TYP	TYPICAL
UIC	UP IN CHASE
UP	OPPOSITE OF DOWN
V	VENT
VB	VACUUM BREAKER
VC	VITREOUS CHINA
VIF	VERIFY IN FIELD
VRV	VACUUM RELIEF VALVE
W	WASTE
W/	WITH
WC	WATER CLOSET

LEGEND

- SANITARY/ WASTE PIPING UNDER SLAB
- SANITARY / WASTE PIPING ABOVE SLAB
- VENT PIPING ABOVE FLOOR
- VENT PIPING UNDER SLAB
- COLD WATER PIPING
- HOT WATER PIPING
- FUEL GAS PIPING
- VACUUM PIPING
- VACUUM PIPING UNDER SLAB
- COMPRESSED AIR PIPING
- COMPR., AIR PIPING BELOW SLAB
- BALL VALVE
- VERTICAL BALL VALVE
- DROP/RISE IN LINE
- LINE UP TO FLOOR ABOVE
- TEE -DROP
- SHOCK ABSORBER
- XX-1 PLUMBING FIXTURE/EQUIPMENT NUMBER TAG

GENERAL NOTES

1. All work shall be in accordance with the State Plumbing Code, state and local laws, codes and ordinances, National Fire Code (NFPA), or these plans or specifications, whichever is more strict.

2. All drawings are schematic only, and are intended to indicate the intent, extent, and general arrangement of work. They are not meant to show every fitting, change of direction or every situation. Verify locations in the field. Work indicated shall be furnished complete to perform the function intended.

3. Carefully coordinate the space requirements and location of piping with the other trade contractors. If coordination fails, conflicts will be decided in favor of the other contractors with this contractor relocating his piping and equipment at no expense to the Owner.

4. For pipe sizes not shown on the floor plans, refer to fixture schedules and details as well as adjacent floors plans. For otherwise indeterminable pipe segments, the size shall be the same as the largest known adjacent segment. Where pipe sizes are erroneously shown to decrease then increase, the smaller segment shall be increased to match the larger segment. When a conflict exists, the larger size shall govern. Pipe sizes are nominal (not O.D.) unless specifically noted otherwise.

5. All piping shall run concealed above ceilings, in walls, in soffits and in chases unless noted otherwise. Special care shall be taken when dropping 3" nominal waste pipe in 3-½" wall cavities to ensure correct fit and alignment.

6. No structural members shall be cored or cut without approval of the Structural Consultant.

7. All plumbing shall be supported from the building structure. All piping drops to fixtures shall be anchored solid to walls with a steel support bracket with adjustable clip.

8. All water piping shall be installed parallel to building lines and pitched to low points. Provide draw-offs at low points. Piping shall be run neatly grouped together. Also group with heating piping when practical.

9. All piping through roofs, masonry walls and partitions shall have steel pipe sleeves. Openings between pipes and sleeves shall be caulked and sealed smoke and water tight. All pipe penetrations through a fire rated wall or floor shall have a U.L. listed fire stopping system rated to match the rating of the wall, as per the NFPA.

10. All wall fixtures shall be carrier mounted unless otherwise specified.

11. All domestic water water piping shall be insulated unless otherwise specified.

12. Run all piping on warm side of building insulation. No water, or waste lines shall be run in exterior walls, unless directly indicated.

13. Provide shock absorbers (water hammer arresters) where shown on drawings. Also provide them on feeders to any quick closing equipment provided by others. Sizes shall be type "I" unless indicated otherwise and conform to P.D.I. standards.

14. All sanitary waste piping 3" and less shall pitch down at ¼" per L.F. All 4" and larger piping shall pitch at ¼" per L.F. whenever possible. No sanitary/ waste piping under slab shall be less than 2" in diameter.

15. All copper Domestic water piping shall be type "K" or "L", type "M" is prohibited. Substitution with PEX is not acceptable.

PLUMBING FIXTURE SCHEDULE

TAG	FIXTURE	COLD WATER	HOT WATER	SAN/ WASTE	VENT	REMARKS
DC-1	DENTAL CHAIR FUTURE	1/2"		2"	1-½"	1/2" CA, 3/4" V CAP ALL FOR FUTURE
LV-1	LAVATORY, WALL MTD - ADA	1/2"	1/2"	1-¼"x 1-½"	1-½"	VC, SINGLE HANDLE FAUCET
SK-1	SINK, SINGLE BOWL, EXAM COUNTER MOUNTED	1/2"	1/2"	1-½"	1-½"	SMALL S.S. HAND WASH FAUCET
SK-2	SINK, SINGLE BOWL, WORK COUNTER MOUNTED	1/2"	1/2"	1-½"	1-½"	S.S. 25"x22"x6-1/2" AUTOMATIC FAUCET
SK-3	SINK, SINGLE BOWL HOSPITALITY - ADA	1/2"	1/2"	1-½"	1-¼"	S.S., 20"X22"x6-1/2" BAR FAUCET
WC-1	WATER CLOSET, FLOOR MTD TANK - ADA	1/2"	-	4"	2"	VC, 16-½", 1.6 GPF, RH RIGHT HAND FLUSH LEVER
WC-2	WATER CLOSET, FLOOR MTD TANK - ADA	1/2"	-	4"	2"	VC, 16-½", 1.6 GPF, LH STANDARD FLUSH LEVER

WATER SPEC. SCHEDULE

TAG	ITEM	CW	HW	OUTLET	REMARKS
SA-1	SHOCK ABSORBER	1/2 OR 3/4""		-	P.D.I. A
SA-2	SHOCK ABSORBER	3/4"		-	P.D.I. B

DRAIN SPEC. SCHEDULE

TAG	ITEM	WASTE	VENT	REMARKS
FCO-1	ROUND, ADJUSTABLE, SOLID TOP FLOOR CLEANOUT	SIZE OF PIPE	-	NICKEL BRONZE TOP ZURN ZN1400-BP-K
FCO-2	ROUND, ADJUSTABLE, W/ CARPET MARKER CLEANOUT	SIZE OF PIPE	-	NICKLE BRONZE TOP ZURN ZN1400-BP-K-CM

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10257
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Portland
High School
Health Center

284 Cumberland Ave.
Portland, Maine

BID SET
April 24, 2013

Plumbing
Schedules

Scale: NONE

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT #10
10 FOREST FALLS DRIVE
YARMOUTH, MAINE 04096
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
207-846-1441

M.S.E. Proj. 1310

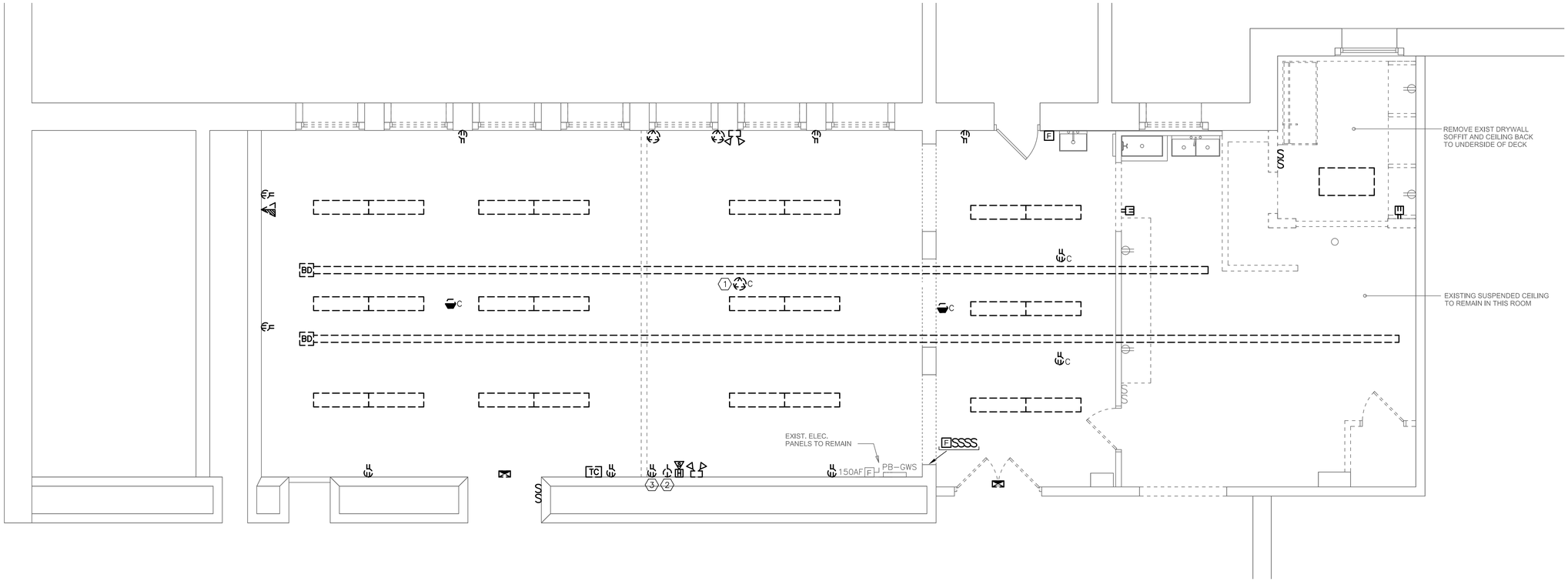
P2

NOTES:

1. SEE E1.0 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. INTENT IS TO DEMOLISH ALL RECEPTACLES AND LIGHTING FIXTURES AS SHOWN ON THE ATTACHED PLAN.
3. EXISTING BUS DUCT SYSTEM LOCATED ABOVE THE CEILING SHALL BE REMOVED. A SHORT SECTION SHALL BE REINSTALLED AS SHOWN ON E1.0. THE EXISTING PANIC BUTTON AND RELAY TO CUT POWER TO THE BUS DUCT (AND SUBSEQUENT EQUIPMENT) SHALL BE REINSTALLED AND WIRED TO THE NEW BUS DUCT CIRCUIT.
4. INTENT IS TO RETAIN THE EXISTING PANELBOARD AND FUSED DISCONNECT SWITCH TO PROVIDE POWER TO THE NEW DEVICES AND EQUIPMENT IN THIS AREA.
5. INTENT IS TO REUSE SOME OF THE 8' LIGHTING FIXTURES FOR REINSTALLATION.
6. TRENCHING OF EXISTING SLAB WILL BE REQUIRED FOR UNDERSLAB CONDUIT RUNS FOR FEEDING THE NEW DENTAL CHAIRS.

KEYED NOTES:

1. TABLE SAW
2. RECEPT FOR GRINDER 110V/5.0A
3. RECEPT FOR DRILL PRESS



1 ELECTRICAL DEMOLITION PLAN
SCALE: 1-4" = 1'-0"

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STATE OF MAINE
TIMOTHY D. MATTHEWS
No. 9139
LICENSED PROFESSIONAL ENGINEER
4/24/13

Portland High School Health Clinic

284 Cumberland Ave.
Portland, Maine

BID SET
April 24, 2013

Electrical
Demolition Plan

1/4" = 1' - 0"

ED 101

POWER SYMBOLS

- LP1-2 — HOME RUN TO PANEL (CKT. NO. AS SHOWN)
- RECEPTACLE, +18" AFF
- 20 AMPERE, 120 VOLT DUPLEX HOSPITAL GRADE RECEPTACLE, +18" AFF
- 20 AMPERE, 120 VOLT DOUBLE DUPLEX RECEPTACLE, +18" AFF
- 20 AMPERE, 120 VOLT DOUBLE DUPLEX HOSPITAL GRADE RECEPTACLE, +18" AFF
- 20 AMPERE, 120 VOLT SINGLE RECEPTACLE
- 20 AMPERE, 120 VOLT DUPLEX HOSPITAL GRADE GFCI RECEPTACLE
- 20 AMPERE, 120 VOLT DUPLEX GFCI RECEPTACLE, +18" AFF
- XX — OTHER POWER RECEPTACLE NEMA DESIGNATION AS NOTED
- hp — MOTOR
- J — JUNCTION BOX
- CB XX — CIRCUIT BREAKER SIZED AS NOTED
- PANELBOARD NORMAL POWER
- BD — BUS DUCT AMPERE RATING AS NOTED
- F 200/3 — FUSED SAFETY SWITCH, RATING AS NOTED (POLES / AMPERES)
- M — MANUAL TOGGLE OPERATED MOTOR STARTER
- COMBINATION VOICE/DATA SYSTEM OUTLET
- PANIC SWITCH (EMERGENCY POWER OFF)

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
BUS DUCT	*			1	60	A	20 (2)	2	1.5			EXAM 107 & 109 RECEPTS
		*		3		B	20 (2)	4		0.8		ORAL HEALTH 110 RECEPTS
			*	5		C	20 (2)	6			0.8	ORAL HEALTH 111 RECEPTS
UNDERCABINET REF & FRZR	1.0			7	20	A	20	8	1.0			DENTAL CHAIR 110
SF & EF		0.3		9	20	B	20	10		1.0		DENTAL CHAIR 111
WORKROOM 113 COPIER			1.0	11	20	C	20	12			1.1	MEETING RM. 112 RECEPTS
X-RAY MACHINE	1.5			13	20	A	20	14	0.3			MEETING RM. 112 FRIDGE
WORKROOM 113 STERILIZER		1.0		15	20 (1)	B	20 (1)	16		1.3		COUNSEL 105/OFFICE 102
WORKROOM 113 COUNTERTOP			0.6	17	20 (1)	C	20 (1)	18			1.7	FC-1 & FC-2
SUBTOTAL	2.5	1.3	1.6						2.8	3.1	3.6	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A-PHASE	5.3	PANEL: GWS
MAIN LUGS ONLY BUS AMPS: 225A	TOTAL KVA B-PHASE	4.4	
MOUNTING: SURFACE	TOTAL KVA C-PHASE	5.2	LOCATION: SHOP AREA
SHORT CIRCUIT RATING: 10 KAIC	TOTAL KVA	14.9	

NOTES: EXISTING WESTINGHOUSE PRL1

(1) NEW BREAKER
(2) REPLACE 60A, 3P BREAKER WITH NEW 20A, 1P BREAKERS.

2 ELECTRICAL PANEL SCHEDULE
NOT TO SCALE

GENERAL NOTES

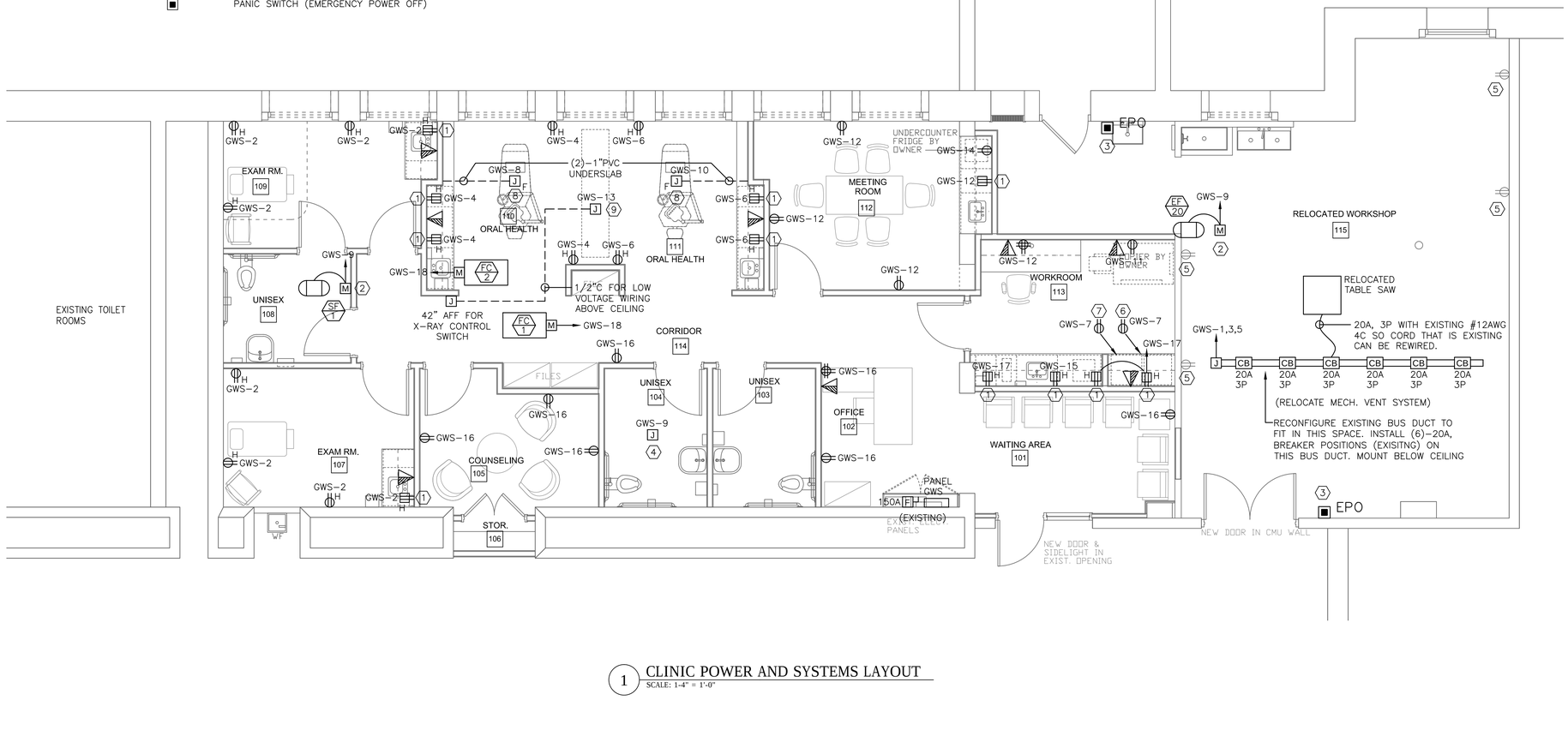
1. ALL WORK SHALL BE IN COMPLIANCE WITH NFPA-70, NATIONAL ELECTRICAL CODE.
2. ALL MOTOR SAFETY SWITCHES, DISCONNECTS AND MOTOR STARTERS ARE FURNISHED BY DIVISION 16000 UNLESS NOTED AS FURNISHED WITH EQUIPMENT (FWE).
3. UNLESS OTHERWISE NOTED, CONVENIENCE RECEPTACLES SHALL BE MOUNTED 18 INCHES AFF AND LIGHTING TOGGLE SWITCHES 48 INCHES AFF.
4. ALL PENETRATIONS THROUGH FLOORS, RATED WALLS AND PARTITIONS SHALL BE SEALED WITH A UL APPROVED FIRE SEALANT METERIAL TO MAINTAIN THE RATING OF THE SEPARATION.
5. LIGHTING TOGGLE SWITCHES SHALL BE COMMERCIAL SPECIFICATION GRADE, 120 VOLT, SIDE WIRED AS MANUFACTURED BY LEVITON, PASS & SEYMOUR, OR APPROVED EQUAL.
6. CONVENIENCE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE UNLESS SHOWN OTHERWISE, GROUNDING TYPE, NEMA 5-20R, SIDE WIRED, AS MANUFACTURED BY LEVITON, PASS & SEYMOUR, OR APPROVED EQUAL.
7. HOSPITAL GRADE RECEPTACLES SHALL BE FURNISHED AS SHOWN AS MANUFACTURED BY LEVITON, PASS & SEYMOUR OR APPROVED EQUAL.
8. DEVICE COVERPLATES SHALL BE BRUSHED STAINLESS STEEL IN ALL FINISHED SPACES.
9. UNLESS OTHERWISE NOTED ALL HOMERUNS FOR 15 OR 20A CIRCUITS SHALL BE 2#12AWG & #12 GND. HOMERUNS FED FROM 20A, 1P CIRCUITS IN EXCESS OF 100 FEET (FOR 120V CIRCUITS). ALL WIRING SHALL BE COPPER.
10. CONDUIT SYSTEMS: EXPOSED INTERIOR CONDUITS SHALL BE EMT, 3/4" MINIMUM. PROPERLY SUPPORTED MC CABLE ASSEMBLIES MAY BE USED ABOVE CEILINGS AND IN WALLS. HOSPITAL GRADE WIRING SHALL BE IN HCF TYPE MC CABLE ASSEMBLIES AS MANUFACTURED BY SOUTHWIRE OR APPROVED EQUAL.

NOTES:

1. SEE E0.0 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

KEYED NOTES:

1. MOUNT 6" ABOVE COUNTER TOP COORDINATE WITH BACKSPLASH.
2. CONTROLLED BY ATC SYSTEM
3. RECONNECT EPO SWITCH TO EXISTING RELAY SYSTEM WHICH DISCONNECTS POWER UPON OPERATION.
4. JUNCTION BOX FOR LOW VOLTAGE TOILET CONTROLS TRANSFORMER. LOCATE AS DIRECTED BY MECHANICAL CONTRACTOR.
5. EXISTING RECEPTACLE. CONNECTED TO EXISTING CIRCUIT.
6. UNDER COUNTER REFRIGERATOR.
7. UNDER COUNTER FREEZER.
8. SEE ARCHITECTURAL PLANS FOR LOCATION TO STUB CONDUITS FOR FUTURE DENTAL CHAIR.
9. FURNISH JUNCTION BOX IN CEILING AND CONDUITS ABOVE CEILING AND IN WALL TO WALL MOUNTED RECESSED 2" X 4" BOX FOR CONTROLS. THE X-RAY MACHINE IS NOT GOING TO BE INSTALLED AT THIS TIME HOWEVER THE INTENT IS TO MAKE READY FOR FUTURE EQUIPMENT.



1 CLINIC POWER AND SYSTEMS LAYOUT
SCALE: 1-4" = 1'-0"

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STATE OF MAINE — TIMOTHY D. MATTHEWS — No. 9139 — LICENSED PROFESSIONAL ENGINEER

4/24/13

Portland High School Health Clinic

284 Cumberland Ave.
Portland, Maine

BID SET
April 24, 2013

Electrical Power & Systems Layout

1/4" = 1' - 0"

E 101

LIGHTING SCHEDULE

TYPE	DESCRIPTION	MANFACTURER	LAMPS	MOUNTING	NOTES
A	2' X 4' FLUORESCENT RECESSED ACRYLIC LENS FIXTURE WITH SUPER T8 LAMP/BALLAST COMBINATION 120V	LITHONIA	(2)-32W SUPER T8	CEILING GRID	MODEL #: 2GT8232U316MVOLTADOPL
B	8' INDUSTRIAL FIXTURE (EXISTING TO BE RELOCATED) 120V	N/A	(2)-32W T8	CEILING SURFACE	EXISTING
C	CEILING MOUNTED DUAL TECHNOLOGY UTRASONIC AND PASSIVE INFRARED OCCUPANCY SENSOR 120V	HUBBELL	N/A	CEILING SURFACE	MODEL #: OMNIDT500 FURNISH RELAYS/POWER PACKS AS REQUIRED FOR A COMPLETE AND OPERABLE INSTALLATION
W	WALL MOUNT PASSIVE INFRARED OCCUPANCY SENSOR 120V	HUBBELL	N/A	WALL	MODEL #: LHMTS
	EMERGENCY BATTERY UNIT 120V	DUAL-LITE	(2)-3W LED	WALL SURFACE	MODEL #: LZ15-03L
	LED EXIT SIGN EMERGENCY BATTERY UNIT COMBINATION 120V	DUAL-LITE	(2)-3W LED	CEILING SURFACE	MODEL #: LTURW3-03L

LIGHTING SYMBOLS

- A — FLUORESCENT LIGHT FIXTURE
- X — FLUORESCENT PENDANT MOUNTED FIXTURE
- EMERGENCY LED EXIT SIGN
- COMBINATION EMERGENCY EXIT SIGN & LIGHTING FIXTURE WITH DUAL LAMPS HEADS BATTERY AND CHARGER
- EMERGENCY LIGHTING FIXTURE WITH DUAL LAMPS HEADS BATTERY AND CHARGER
- REMOTE EMERGENCY LIGHTING LAMP HEAD
- S — LIGHT SWITCH
  - P a — DENOTES FIXTURE SWITCHED
    - P = PILOT LIGHT (WHERE NOTED)
    - 3 = 3-WAY (WHERE NOTED)
    - 4 = 4-WAY (WHERE NOTED)
- X — ULTRASONIC/INFRARED OCCUPANCY SENSOR
  - C = CEILING MOUNTED
  - W = WALL MOUNTED 48" AFF (TO TOP)

FIRE ALARM SYMBOLS

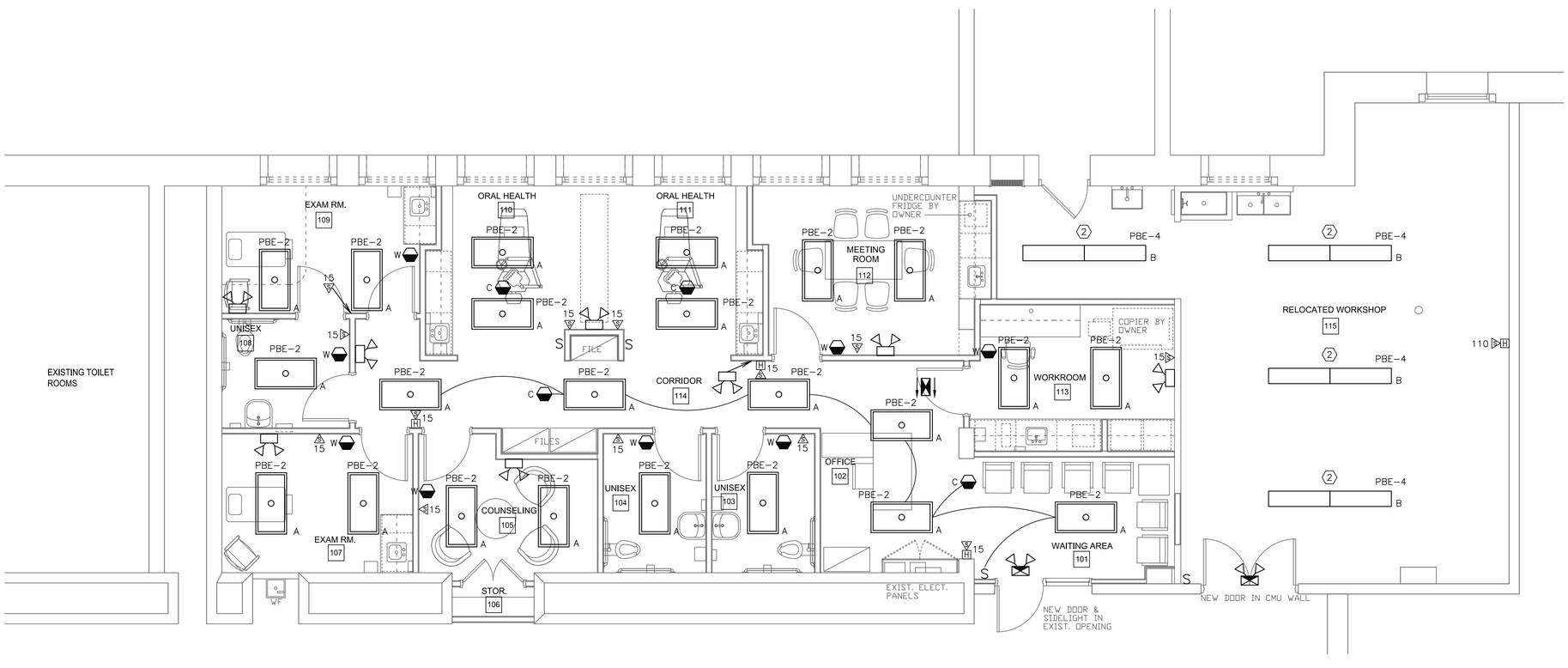
- F — PULL STATION
- FA — FIRE ALARM AUDIBLE/VISIBLE NOTIFICATION APPLIANCE (GENERAL EVACUATION)
- FA — STROBE UNIT XX= CANDELA
- FA — NON-SYSTEM STROBE UNIT
- DS — DUCT SMOKE DETECTOR
- T — REMOTE TEST STATION
- MM — MONITOR MODULE
- CM — CONTROL MODULE

NOTES:

1. SEE E0.0 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. WIRE EMERGENCY LIGHTS AND EXIT SIGNS TO LOCAL AREA LIGHTING CIRCUIT.
3. INTENT IS TO REUSE EXISTING CIRCUITS FOR LIGHTING IN THIS AREA, FED FROM PANEL PBE LOCATED AT THE END OF THE HALL. FURNISH ADDITIONAL WIRING AS REQUIRED.

KEYED NOTES:

1. EXISTING PANEL
2. EXISTING LIGHTING FIXTURE TO BE RELOCATED. RECONNECT LIGHTING FIXTURES TO EXISTING LIGHTING CIRCUIT AND CONTROLS.



1 CLINIC LIGHTING & FIRE ALARM LAYOUT
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Electrical Lighting & Fire Alarm Layout
1/4" = 1' - 0"

E 201