PORTLAND PUBLIC SCHOOLS
DEERING HIGH SCHOOL - FLS RENOVATIONS

370 Stevens Avenue, Portland, Maine

Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
06/28/2018

Project Manual

Bid Set
May 11, 2018

Winton Scott Architects

5 Milk Street
Portland, ME
0 4 1 0 1

T. 207.774.4811
F. 207.774.3083
www.wintonscott.com

BID #18077

City of Portland

Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
06/28/2018

Portland Public Schools

Functional Life Skills
Classroom Renovations
Deering High School
130 Stevens Avenue

May 16, 2018

Bid #18077

BID #18077

Notice to Contractors

Functional Life Skills
Classroom Renovations
at
Deering High School
130 Stevens Avenue

Sealed bids will be received at the Purchasing Office, Room 103, City Hall, 389 Congress Street, Portland, Maine 04101, until **3:00 P.M., Thursday, June 14, 2018** at which time they will be publicly opened, for:

Project Name: Functional Life Skills Classroom Renovations
Bid #18077

Location: 130 Stevens Avenue
Portland, Maine

Outline of Work: The project consists of interior renovation of the Functional Life Skills spaces at Deering High School. The work under this contract includes but is not limited to materials and labor for selective demolition, kitchen and storage cabinets, HPDL counter tops, solid surface counter tops, hollow metal doors and frames, pocket wood door with wood trim, replacement aluminum windows, suspended acoustical ceiling tiles, installation of bathroom accessories, plumbing, lighting, electrical outlets, and related work complete and ready for use.

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 30, 2018 at 10:00 A.M.** Only those firms represented at this meeting may bid on the project.

Copies of the above documents will be available at the Purchasing Office, Room 103, City Hall, 389 Congress Street, Portland, ME 04101, electronic (emailed) documents will be at no charge, hard copies are available upon payment in advance of $25.00 for each set of plans and specifications or $30.00 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

BID #18077

CITY OF PORTLAND, MAINE

Functional Life Skills
Classroom Renovations
At
Deering High School
130 Stevens Avenue

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 Thursday, June 14, 2018**, at which time they will be publicly opened.

MANDATORY PRE-BID MEETING

There will be a **mandatory pre-bid meeting on Wednesday, May 30, 2018 at 10:00am.** This meeting will commence at the site Deering High School, 130 Stevens Avenue, Portland, Maine. Interested bidders shall meet a City Representative at the Main Entrance. Only those firms represented at this meeting will be allowed to submit a bid on this project.

All questions shall be directed in writing ONLY to the Purchasing Office at the above address and be received at least one week prior to the bid opening date (FAX 207-874-8652, or email krc@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 ninety (90) days after their opening. Late, faxed or bids submitted electronically will be rejected.

This bid will be awarded to the qualified 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.

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. **The City will apply for and obtain the building permit, contractors will be responsible for acquiring all necessary trade 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 and all other applicable laws, including the Maine Human Rights Act, ordinances and regulations regarding equal opportunity and equal treatment.

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.

Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
06/28/2018

May 16, 2018

Karen C. Marston
Assistant Purchasing Manager

BID #18077

PROPOSAL

Proposal of _____

Name

_____

Address

Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
06/28/2018

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 **Functional Life Skills Classroom Expansion at Deering High School, 130 Stevens Avenue,** 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 ninety (90) calendar days after opening of the bids.

BID #18077

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 state the following Proposal:

BASE BID
LUMP SUM PRICE: $ _____
(Award Basis)

ALTERNATE #1 - ADD: Remove existing windows as shown on drawings (11 total) and replace with new aluminum windows (fixed over awning:

$ _____

ALTERNATE #2 - ADD: Remove existing tub and replace with roll-in shower. Install new tiles on shower floor and walls, new tiles to match existing.

$ _____

ALTERNATE #3 - ADD: Delete dryer indoor lint trap filter and add condensate ventless dryer WED99HEDW by Whilpool.

$ _____

ALTERNATE #1 - DELETE: Delete recycled rubber throughout and replace with VCT.

$ _____

TIME FOR COMPLETION FROM START OF WORK: _____*
**Substantial completion must be before August 24, 2018*

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" 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.

Acknowledgement of Addenda Numbered: _____

Respectfully submitted this _____ day of _____ , 2018

IF AN INDIVIDUAL, SIGN HERE

Signature of Bidder _____

Address _____

_____

Telephone Number: _____ Fax Number: _____

Email Address: _____

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 _____

Email Address: _____

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 _____

Email Address: _____

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 #18077

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 #18077

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 Corporation, include and identify President, Treasurer, Manager)

_____ _____

_____ _____

_____ _____

BID #18077

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		

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	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

BID #18077

[SAMPLE AGREEMENT
TWEEN THE CITY OF PORTLAND
AND
_____

Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
06/28/2018

AGREEMENT entered into this _____ day of _____, 20__, by and between the **CITY OF PORTLAND**, a body politic and corporate, (hereinafter the "**CITY**"), and_____ _____, a corporation with a mailing address of_____ _____ (hereinafter the "**CONTRACTOR**").

W I T N E S S E T H

WHEREAS, the **CITY** did advertise for Requests for Bids by Bid #____ titled _____; and

WHEREAS, the **CONTRACTOR** did under date of _____, 2018, submit a bid for such work; and

WHEREAS, after due consideration of all of the bids the **CITY** did award the bid to the **CONTRACTOR**; and

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** will furnish the materials, supplies, equipment and labor and will perform all work required to construct separated storm and sewer infrastructure (hereinafter the "Work"), in accordance with the specifications contained in the Notice and Specifications issued to the CONTRACTORs under date of _____ by the Purchasing Manager for the City of Portland, and also in accordance with **CONTRACTOR**'s Proposal dated _____ _____.

   A copy of said Notice and Specifications, including all items in TABLE OF CONTENTS, ADDENDUMS, and **CONTRACTOR**'s Proposal are attached to this Agreement and made a part herein.

   The restatement of any of the terms contained in the Notice and Specifications or Proposal shall not be deemed to waive any terms not so restated. If a disagreement is found between the said attachments and this document, then this document shall govern; provided, however, that this document and its attachments shall be construed to be supplemental to one another to the extent possible.

2. **CONTRACTOR** covenants and agrees that all work performed and materials used shall be free from all defects, and that all work shall be performed in a good workmanlike manner. Unless a longer warranty period is specified in the attachments hereto, all Work provided hereunder shall be warranted by **CONTRACTOR** for one (1) full year from the date of completion of all Work hereunder and acceptance thereof by the **CITY**. Notwithstanding the foregoing, any longer period specified in the attachments shall stay in effect. **CONTRACTOR** shall perform in compliance with all applicable federal, state and local laws and rules and shall obtain at its own cost all necessary permits.

3. Prior to the execution of this Agreement, **CONTRACTOR** will procure and maintain Public Liability Insurance coverage and Automobile Insurance coverage for the Work agreed to under this Agreement and as outlined within the contract documents, whether such operations be by themselves or by any subcontractor under them, with a limit of liability of not less than $1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than $1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $500,000 for all property damage sustained by any one person in any one accident-, and a limit of liability of not less than $500,000 aggregate for any such damage sustained by two or more persons in any one accident. Name **CITY** as an additional insured on the policy, and provide the **CITY** a certificate of insurance evidencing such coverage, in this way: certificate must say either: A) "the policy actually been endorsed to name the City of Portland as an Additional Insured" and copy of the endorsement must come to the City of Portland with the certificate, or B) "the policy already includes an endorsement, such as the General Liability Expansion Endorsement, by which the City of Portland is, in fact, automatically made an additional insured." A Certificate which merely has a box checked under 'Addl Insr," or the like, or which merely states The City of Portland is named an Additional Insured, will not be acceptable. **CONTRACTOR** shall furnish and thereafter maintain certificates evidencing such coverage, which certificates shall guarantee thirty (30) days' notice to **CITY** of termination of insurance from insurance company or agent.

4. The **CONTRACTOR** shall furnish to the **CITY**, upon execution of this Agreement, a Contract Performance Bond and a Contract Labor and Material Payment Bond each in the amount of _____ _____ Dollars ($_____.00), guaranteeing one hundred percent (100%) performance of this Agreement, including the guarantee period, and free and clear of any and all liens, attachments and encumbrances.

   The Bonds shall remain in effect for one (1) year after final acceptance of the Work, and protect the **CITY**'s interest in the one (1) year guaranty of workmanship and materials, and also shall insure settlement of claims, for the payment of all bills for labor, materials and equipment by the **CONTRACTOR**.

5. 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 attorney's fees arising out of or resulting from the performance of this 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.

CONTRACTOR shall further defend, indemnify and hold the **CITY** harmless from any claim or lien of any nature filed against the **CITY** or its property as a result of services performed or materials provided under this Agreement by a subcontractor, supplier or anyone employed by **CONTRACTOR.** In the event such claim or lien is filed against **CITY, CONTRACTOR** shall defend such claim on behalf of **CITY** by counsel acceptable to **CITY** or shall otherwise discharge such claim or lien by a means acceptable to **CITY**. **CITY**'s acceptance hereunder shall not be unreasonably withheld.

6. **CONTRACTOR** shall begin Work upon issuance of a notice to proceed issued by the **CITY** and shall complete the Work no later than _____. Placement of final surface course pavement shall be completed after _____. The time for performance may be extended by the written consent of the Director or her designee.

7. 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. **Engineers** will have the authority to stop work in progress if such work is being done contrary to the plans, specifications, or engineering practice. In the event that any dispute arises 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.

8. Upon performance of all the terms and conditions of this Agreement, **CITY** will pay **CONTRACTOR** _____ Dollars ($_____), in full payment for the **CONTRACTOR**'s performance.

9. **CONTRACTOR** shall keep accurate records of all Work performed and furnished under this Agreement and shall submit such information on monthly invoices. Payment for such Work shall be made to **CONTRACTOR** not more than thirty (30) days after receipt of an invoice and acceptance of the Work by the **CITY**.

10. **CITY** reserves the right to require **CONTRACTOR** to provide waivers of lien for labor and materials prior to the issuance of final payment by the **CITY**.

11. Payment shall be in: – Prior to substantial completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as the **CITY** may determine or may withhold, including but not limited to damages in accordance with general conditions:
    a. 95 percent of work completed (with balance being retainage); and
    b. 95 percent of cost of materials and equipment not incorporated in the work (with balance being retainage)

    Upon substantial completion, the **CITY** shall pay an amount sufficient to increase total payments to the **CONTRACTOR** to 98 percent of the work completed, less such amounts as the **CITY** shall determine in accordance with general conditions. The final two percent of the value of the Work shall be retained for a period of one year from the date of substantial completion.

12. The **CITY** may terminate this Agreement for cause by written Notice to the **CONTRACTOR**. In the event of such termination, **CONTRACTOR** shall receive compensation for any satisfactory work completed prior to termination.

13. The **CITY** shall 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** shall pay the **CONTRACTOR** for any unpaid, unrecovered, or unrecoverable out-of-pocket costs for supplies, materials and/or services provided or amounts expended or incurred in reliance on this Agreement prior to the effective date of such notice.

14. Any disputes arising out of or in the course of this Agreement, which are not settled by mutual agreement of the parties, shall be resolved in the courts of the State of Maine.

15. Out of concern for the public, **CITY** employees and **CONTRACTOR**'s employees, all work performed by **CONTRACTOR** shall be in conformance with pertinent OSHA, local, state and federal government regulations.

16. Work must be completed by _____ in its entirety and ready for **OWNER** acceptance.

IN WITNESS WHEREOF, the said **CITY OF PORTLAND** has caused this Agreement to be signed and sealed by Jon Jennings, 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:_____
Jon Jennings
It's City Manager

WITNESS:

_____

_____

By:_____

_____
(Print or type name)

Its_____

Approved as to form:

_____

Approved as to funds:

_____

SECTION 01 10 00

SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Work under other contracts.
4. Owner-furnished products.
5. Use of premises.
6. Owner's occupancy requirements.
7. Specification formats and conventions.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Project consists of interior renovations.
1. Project Location: Deering High School, 130 Stevens Avenue, Portland, Maine.
2. Owner: City of Portland.

B. Architect Identification: The Contract Documents, dated April 16, 2018, were prepared for the Project by Winton Scott Architects, P.A., 5 Milk Street, Portland, ME 04101. Tel: 207-774-4811.

C. The Work includes but is not limited to selective demolition, cutting & patching, millwork, hollow metal frames, wood doors, aluminum windows, metal studs, gypsum wall board, acoustical ceilings, painting, flooring, glass and glazing, plumbing, electrical systems complete and ready for use.

1.3 COMPLETION DEADLINE

A. The work shall be substantially complete on or before August 1, 2017.

1.4 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

B. Contract Type: Per City of Portland.

1.5 WORK UNDER OTHER CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts. Other Contracts shall include:
1. Telecommunications and data cabling.
a. The electrical contractor shall provide raceways, conduits and boxes.

B. Work under other contracts shall include work by the Owner as shown for the following:
1. Non-structural demolition including removals and clean up.
2. Finish flooring, including floor preparation.

3. Storage, Room 118D, walls and door and frame.
4. Painting.

1.6 OWNER-FURNISHED PRODUCTS

A. The contractor shall incorporate the following items furnished by the Owner into the work:
   1. Plumbing fixtures.
      a. Furnished materials shall include china, kitchen sinks & faucets only.
      b. Fittings, trim, piping and accessories shall be provided by the Contractor.
   2. Toilet accessories.
   3. Visual display mounting brackets.
   4. Interactive TV / Smartboard & TV
   5. Kitchen appliances.

1.7 USE OF PREMISES

A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period.

B. Use of Site: Limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Owner Occupancy: Allow for Owner occupancy of Project site around building.
   2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Use of Existing Building: Maintain the existing building in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period. Coordinate precautions with Owner.

D. Time Restrictions for Performing Interior and Exterior Work: Monday through Friday; 7 am to 5 p.m., unless arrangements are made with the Owner prior to the start of work.

   1. Provide 24 hour notice to Architect when performing work other than normal working hours.

1.8 OWNER'S OCCUPANCY REQUIREMENTS

A. The Owner will occupy the building during the construction period.
   1. Continuous use of the existing building shall be maintained through the project.
   2. Work areas shall be phased as shown.
   3. The Owner shall move furniture before the start of work of each phase as needed.
   4. Noise-producing activities shall be scheduled for nights and/or weekends.
   5. The Owner shall conduct a background check on all on-site construction personnel. The General Contractor shall provide the names and SSN's of staff.

B. Precautions to minimize noise shall be required throughout the course of the work.

1.9 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 49-division format and CSI/CSC's "MasterFormat 2004" numbering system.
   1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in num sequence; however, the sequence is incomplete. Consult the table of contents at the begi of the Project Manual to determine numbers and names of sections in the Cont Documents.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
   2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
      a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

C. References to Related Sections: This paragraph lists only products, construction, and equipment that the reader might expect to find in this Section but are specified elsewhere. This is not meant to be a continuation of a list of work included in each section.

1.10 MISCELLANEOUS PROVISIONS

A. Contract Documents: These documents, including the Contract, General Conditions, Supplementary Conditions, Specification sections, Drawings, Addenda and Modifications, indicate the work of the Contract and related requirements and conditions that have an impact on the project. It is recognized that work of the contract is also unavoidably affected or influenced by natural phenomenon including weather conditions and other forces outside the contract documents. Allow for additional time in the construction schedule for abnormal weather conditions. No change orders will be approved for adverse weather conditions. No change orders will be approved for additional winter heating expenses due to cold weather or rise in fuel costs.

B. Hazardous Materials other than Asbestos: Included in the work may be the removal and/or covering over of hazardous materials. It is the responsibility of the contractor to follow applicable Federal, State and Local guidelines to insure safe and proper handling of these materials.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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 new 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 01 30 00

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 01 73 10

SECTION 01 80 00
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 Owner'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 01 80 00

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. Pre-demolition 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 cabinets.
2. High pressure decorative laminate adjustable shelving.
3. High pressure decorative laminate counters.
4. Solid surfacing countertops.

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 decorative laminate.
2. Thermoset decorative overlays.
3. Exposed cabinet hardware and accessories, one unit for each type and finish.
4. Solid surface.

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.

C. Wood Species for painted finish: Poplar

D. Thermoset Decorative Overlay: Particleboard complying with ANSI A208.1, Grade M-2, or medium-density fiberboard complying with ANSI A208.2, Grade MD, with surface of thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
1. Do not use composite wood and agrifiber products containing urea-formaldehyde resins. Additionally, the laminating adhesive used in fabrication of on-site and shop-applied composite wood and agrifiber assemblies must contain no added urea formaldehyde resins.

E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high-pressure decorative laminates that may be incorporated into the Work include, but are not limited to, the following:
a. Formica Corporation.
b. Lamin-Art.
c. Nevamar Decorative Surfaces.
d. Pionite Decorative Surfaces .
e. Wilsonart International; Div. of Premark International, Inc.
2. Do not use composite wood and agrifiber products containing urea-formaldehyde resins. Additionally, the laminating adhesive used in fabrication of on-site and shop-applied composite wood and agrifiber assemblies must contain no added urea formaldehyde resins.

F. Panel Edging: 3mm PVC to match laminate by Dollken-Woodtape or approved equal.
1. Provide for all drawer and door fronts.
2. Do not use composite wood and agrifiber products containing urea-formaldehyde resins. Additionally, the laminating adhesive used in fabrication of on-site and shop-applied composite wood and agrifiber assemblies must contain no added urea formaldehyde resins.

G. Adhesive for Bonding Plastic Laminate: Contact cement.
1. Do not use composite wood and agrifiber products containing urea-formaldehyde resins. Additionally, the laminating adhesive used in fabrication of on-site and shop-applied composite wood and agrifiber assemblies must contain no added urea formaldehyde resins.

2.2 SOLID SURFACING COUNTERTOPS

A. Grade: Premium, for all countertops.

B. Solid Surfacing: 1/2 in. thick, Corian, color as selected by Architect.
1. Include options from Color Groups A and B

C. Edging and Backsplashes: Built-up solid surfacing unless otherwise indicated, same material as face.
1. Backsplash shall be coved with integral weld continuous with counter top surface.

D. Core Material: Plywood.

E. Sealant: Type as manufactured or recommended in writing by manufacturer of plastic laminate, color to match plastic laminate.

F. Silicone Sealant: Mildew resistant type, formulated for pointing of

2.3 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.

2.4 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.

2.5 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: Amerock BP52998G10, stain nickel finish.
   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.
   10. Full circle Lazy Susan set with 2 trays by Hafele.

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.

2.6 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 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 frames.
2. Hollow metal doors. – **NOT USED**

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. Pre-installation 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 non-vented 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. Post-installed 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 non-templated, 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 positive pressure according to NFPA 252 and UL 10C.

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

D. Pre-installation 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 51 13

ALUMINUM WINDOWS

ADD ALTERNATE #1

PART 1 - GENERAL

1.01 GENERAL CONDITIONS: The General Conditions and Supplementary General Conditions 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 SCOPE: This Section includes all labor, materials, equipment and related services necessary for the fabrication and delivery to the job site of the items shown on the drawings and/or specified herein, including but not limited to the following:

A. Aluminum windows.
   1. Include factory glazing of window units.
   2. Screens at operable units.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Glass and Glazing 08 80 00

1.04 LABORATORY TESTING AND PERFORMANCE REQUIREMENTS

A. Test Units
   1. Air, water, and structural test unit shall conform to requirements set forth in AAMA/NWWDA 101/I.S.2 – 97 and manufacturer's standard locking/operating hardware and insulated glazing configuration.
   2. Thermal test unit sizes shall be 48" (1219 mm) x 72" (1828 mm). Unit shall consist of a fixed over project-out window.

B. Test Procedures and Performances
   1. The air, water, and structural tests shall conform to AAMA/NWWDA 101/I.S.2 - 97 requirements for the window type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
   2. Air Infiltration Test
      a. With ventilators closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (299 Pa).
      b. Air infiltration shall not exceed .10 cfm/SF (.50 l/s•m²) of unit.
   3. Water Resistance Test
      a. With ventilators closed and locked, test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 10.0 psf (479 Pa).
      b. There shall be no uncontrolled water leakage.
   4. Uniform Load Structural Test
      a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 97.5 psf (4668 Pa), both positive and negative.
      b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.
   5. Forced Entry Resistance

a. Windows shall be tested in accordance to ASTM F 588 or AAMA 1302.5 and meet the requirements of performance level 10.

6. Condensation Resistance Test (CRF)
   a. With ventilators closed and locked, test unit in accordance with AAMA 1503.1.
   b. Condensation Resistance Factor (CRF) shall not be less than 46 (frame) and 42 (glass) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.
7. Thermal Transmittance Test (Conductive U-Value)
   a. With ventilators closed and locked, test unit in accordance with AAMA 1503.1.
   b. Conductive thermal transmittance (U-Value) shall not be more than 0.59 BTU/hr•ft^2•°F (3.35 W/m²•k) when glazed with 1" (25 mm) insulated – 1/4" (6 mm) clear, 1/2" (12 mm) air, 1/4" (6 mm) clear glass.

C. Project Wind Loads
   1. The system shall be designed to withstand the following loads normal to the plane of the wall:
      a. Positive pressure of +24 psf at non-corner zones.
      b. Negative pressure of -26 psf at non-corner zones.
      c. Negative pressure of +31 psf at corner zones.

1.05 QUALITY ASSSURANCE

A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.4.

B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the air, water, and structural testing criteria for the appropriate AAMA/NWWDA 101/I.S.2 – 97 window type.

1.06 SUBMITTALS

A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
   1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.07 WARRANTIES

A. Total Window System
   1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
   2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at his expense during the warranty period.

PART 2 - PRODUCTS

2.01 WINDOWS:

A. Basis of design is Universal Window Series 700 projected window w/ 23¼" frame depth. Provide units from one of the following manufacturers:
   1. Universal
   2. Kawneer

3. Efco
4. Peerless

2.02 MATERIALS

A. Aluminum
   1. Extruded aluminum shall be 6063-T5 alloy with an integral polyurethane-filled structural thermal barrier

B. Hardware
   1. Locking handles shall be cam type and manufactured from a white bronze alloy and secured with stainless steel fasteners.
   2. Operating hardware shall be two 4-bar heavy duty friction hinge assembly securely fastened to the frame and vent members.

C. Weather-Strip
   1. All weather-strip shall be Santoprene® or equal.

D. Thermal Barrier
   1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
   2. No thermal short circuits shall occur between the exterior and interior.
   3. Barrier material shall be poured-in-place, two-part chemically curing high strength polyurethane casting resin. A nonstructural thermal barrier is unacceptable.

E. Glass
   1. Insulated glass shall be 1” (25 mm) as manufactured by Universal consisting of ¼” exterior, ½” air spacer, and ¼” interior.

2.03 FABRICATION

A. General
   1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .125” (3 mm).
   2. Mechanical fasteners, welded components, and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
   3. Depth of frame shall not be less than 2 7/16” (61 mm).

B. Frame
   1. Frame components shall be mortise and tenon. Other means of mechanically fastening, i.e., screws shall not be permitted.
   2. Appearance of frame shall replicate a putty-glazed steel frame.

C. Ventilator
   1. All vent extrusions shall be tubular.
   2. Each corner shall be mitered, reinforced with an extruded corner key, hydraulically crimped, and "cold welded" with epoxy adhesive.
   3. Each vent shall have one exterior row of weather stripping installed in specifically designed dovetail grooves in the extrusion and one interior row of drive-in glazing gasket that also forms the interior seals. The exterior gasket will be omitted at the vent bottom rail for project-out vents allowing pressure air to pressure equalize the void between the vent and frame.
   4. ∂Appearance of vent frame shall replicate putty-glazed steel vents.

D. Screens
   1. Screen frames shall be extruded.
   2. Screen mounting holes in the window frame shall be factory drilled.
   3. Screen mesh shall be aluminum or fiberglass.

E. Glazing
   1. Vents
      a. Units shall be inside glazed with a snap-in aluminum glazing bead and Santoprene drive-in wedge against the interior of the glass. The exterior face of the glass shall be set against preshimmed butyl tape.
   2. Fixed Lites
      a. The exterior face of the glass shall be set against preshimmed butyl tape. The interior face of the glass shall be set against a dense neoprene drive-in wedge.

F. Aluminum Finishes
   1. Electrostatically applied baked-on enamel finish conforming with AAMA 603.8 standards

PART 3 - EXECUTION

3.01 INSPECTION

A. Job Conditions
   1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

3.02 INSTALLATION

A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.

B. Plumb and align window faces in a single plane for each wall plane, and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

C. Adjust windows for proper operation after installation.

D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 ANCHORAGE

A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 PROTECTION AND CLEANING

A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 – GENERAL

1.1 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

1.2 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

1.3 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.

1.4 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.

1.5 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.

1.6 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.

1.7 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.

1.8 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 on the drawings.
   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 over 3'-0" wide	Stanley	FBB168-4 1/2"
	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. Non-removable 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. Out-swinging exterior doors.
      b. Out-swinging 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. Latch bolts 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 latch bolt 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 master key 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 master key group AA and grand master key 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 Master key Systems established by the Door and Hardware Institute.
3. Provide each key removable core cylinder with a construction master key 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 master keys, six master keys and two (2) special control key for removing the key removable core cylinder. Provide a total of six (6) construction master keys 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 tra 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 POCKET DOOR SET:
Where pocket door is indicated in the drawings provide a pocket door set equal to the Hager 9678-72.

2.23 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

2.24 HARDWARE SET NUMBERS:

HW1
Door 118C

- Pocket door set
- A.D.A. compliant pulls similar to Trimco #1069

HW2
Door 118D

- Mortise lever handle lockset (Storeroom function)
- Hinges
- Silencers
- Door stop

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 08 71 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 pre-consumer 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 non-slotted 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.

C. Mold-Resistant : install at all wet locations
1. Thickness: 1/2 inch
2. Long edges: Tapered

D. Cement backer board: install behind wall tiles
1. HardieBacker
2. Thickness: 1/4 inch

2.3 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.

2.4 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.

2.5 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. Corner bead: 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 09300
TILE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section includes the following:
1. Unglazed ceramic mosaic tile
2. Glazed wall tile.

1.02 RELATED SECTIONS

A. Section 09 29 00 - Gypsum Board: Cementitious and gypsum backer units specified for tile substrates.

B. Section 10 280 0 - Toilet and Bath Accessories.

C. Section 22 00 00 - Plumbing: Plumbing fixtures.

1.03 SYSTEM DESCRIPTION

A. Ceramic wall tile installed over gypsum backer board using organic adhesive and over concrete block or concrete backer board using Latex-Portland cement mortar, with Latex-Portland cement grouted joints.

B. Ceramic mosaic floor tile installed over concrete floor slabs using Latex-Portland cement mortar, with Latex-Portland cement grouted joints.

C. Ceramic mosaic floor tile installed using Latex Portland cement mortar over a plastic Portland cement mortar bed or over a cured (pre-floated) Portland cement mortar bed, with Latex-Portland cement grouted joints.

D. Large porcelain and glass bodied tile and base using Latex-Portland cement mortar with Latex-Portland cement grouted joints.

1.04 SUBMITTALS

A. Submit in accordance with Division 1, manufacturer's technical information for materials required, except bulk materials.

B. Submit shop drawings indicating tile patterns and locations and widths of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
1. Locate precisely each joint and crack in tile substrates by measuring, record measurements on shop drawings, and coordinate them with tile joint locations, in consultation with Architect.

C. Samples for Verification Purposes: Submit the following:

1. Samples for each type of tile and for each color and texture reouired, not less than 24 inches square on cementitious backer board and grouted.
2. Full size samples for each type of trim, accessory and for each color.
3. Solid plastic surfacing thresholds in 6-inch lengths.
4. Samples of metal edge strip in 6-inch lengths.

D. Certification: Furnish Master Grade Certificates for each shipment and type of tile, signed by manufacturer and Installer.

E. Certified Test Reports: Submit certified test reports from a qualified independent testing laboratory evidencing compliance of tile and tile setting products with requirements specified based on comprehensive testing of current products. Include in reports testing laboratory's interpretation of test results relative to specified requirements.

F. Submit qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, plus other information specified.

1.05 QUALITY ASSURANCE

A. Single-Source Responsibility for Tile: Obtain each color, grade, finish, type, composition, and variety from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Single-Source Responsibility for waterproofing, Setting and Grouting Materials: Obtain preblended aggregate and cement materials and admixtures of a uniform quality from one manufacturer.

C. Installer Qualifications: Engage an experienced Installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.

D. Preinstallation Conference: Conduct conference at project site to comply with requirements of Division 1.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.

B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

1.07 PROJECT CONDITIONS

A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

C. Maintain temperatures at not less than 50 degrees F in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

D. Provide a minimum of 40 foot candles of lighting on surfaces to be tiled. Simulate finished lighting conditions for the installation of wall tile.

1.08 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials that match products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.
1. Tile and Trim Units: Furnish quantity of full- size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following or equal:
1. Tile:
   a. American Olean Tile Company., Inc.
   b. Dal-Tile Corporation.
2. Mortars and Grouts:
   a. Bostik Construction products Division.
   b. Laticrete International Inc.
   c. Mapei Corporation.

2.02 TILE

A. ANSI Standard for Ceramic Tile: Comply with ANSI A137.l "American National Standard Specifications for Ceramic Tile" for types, compositions, and grades of tile indicated.
1. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.

B. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with products and materials indicated for setting and grouting.

C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
1. Provide selections made by Architect from manufacturer's full range of colors, textures, and patterns for products of type indicated.
2. Provide tile trim and accessories that match color and finish of adjoining flat tile.

D. Factory Blending: For tile exhibiting color variations within the ranges selected during sample submittals, blend tIle in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.

E. Mounting: Where factory-mounted tile is required, provide back- or edge-mounted tile assemblies as standard with manufacturer unless another mounting method is indicated.

2.03 TILE MATERIALS

A. Unglazed Ceramic Mosaic Tile: Standard Grade ceramic mosaic tile conforming to ANSI A137.1. provide colors and patterns as indicated on the Drawings. Provide factory-mounted flat tile complying with the following requirements:
1. Composition: porcelain.
2. Nominal Facial Dimensions: 1 inches by 1 inches.
3. Nominal Thickness: 1/4 inch.
4. Face: Plain (Abrasive grain) with cushion edges.
5. Provide matching coved base.
6. Color Range: Colors shall be as selected by Architect from Color Group 3.

B. Glazed Ceramic Wall Tile: Standard Grade, conforming to ANSI A137.l. Provide bright glazed or matte glazed wall tile in colors and patterns indicated on the Drawings. Provide flat tile complying with the following requirements:
1. Nominal Facial Dimensions: 4 inches by 8 inches.
2. Nominal Thickness: 5/16 inch.
3. Face: Plain with cushion edge.
4. Color Range: Colors shall be as selected by Architect from Color Group 2.

C. Unglazed Large porcelain And Glass Bodied Tile: Standard Grade conforming to ANSI A137.1. Provide square-edged flat tile complying with the following requirements:
1. Wearing Surface: Nonabrasive.
2. Nominal Facial Dimensions: 12 inches by 12 inches.
3. Nominal Thickness: 1/2 inch.
4. Face: Plain.
5. All trim shall match field tile.
6. Product: FlorGres Chromtech or equal.

D. Trim Units: provide tile trim units to match characteristics of adjoining flat tile and to comply with following requirements:

1. Size: As indicated, coordinated with sizes and coursing of adjoining flat tile where applicable.
2. Shapes: As follows, selected from manufacturer's standard shapes:
   a. Base for Portland Cement Mortar Installations: Coved.
   b. Base for Thinset Mortar Installations: Straight.
   c. Wainscot Cap for portland Cement Mortar Installations: Bullnose cap.
   d. Wainscot Cap for Thinset Mortar Installations: Surface bullnose.
   f. External Corners for Portland Cement Mortar Installations: Bullnose shape with a radius of at least 3/4 inch unless otherwise indicated.
   g. External Corners for Thinset Installations: Surface bulinose.
   h. Internal Corners: Field-butted square corner except use coved base and cap angle pieces designed to member with stretcher shapes.

E. Solid Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements of ANSI Z124.3, Type 5 or Type 6, without a precoated finish.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Avonite; Avonite, Inc.
   b. Corian; DuPont Polymers.
   c. Fountainhead; Nevamar Corp.
2. Thresholds shall not exceed 1/2 inch in height above adjacent floor finishes. Provide beveled thresholds with a slope no greater than 1:2 to comply with ADA requirements or requirements of authority having jurisdiction.
3. Width of threshold shall be equal to width of door frame.
4. Color: Corian Price Group D, or approved equal.

2.04 SETTING MATERIALS AND ACCESSORIES

A. Waterproof Membrane: provide one of the following or equal:
1. "Hydroment Ultra-Set" integral waterproofing membrane by Bostik Construction products Division.
2. "Planicrete W" by Mapei Corporation.
   a. Accessories: Flexible PVC (0.030 inches thick) reinforcing material.
3. "Laticrete 9235" Waterproof Membrane by Laticrete International.

B. Reinforcing Wire Fabric: Galvanized welded wire fabric 2 inches by 2 inches - WO.3 x WO.3 (16 ASW gage or 0.0625 inch diameter); comply with ASTM A185 and ASTM A82 except for minimum wire size.

C. Bond coat for tile over cast-in-place concrete, over masonry walls and over cementitious backer board: Latex-Portland cement mortar conforming to ANSI A118.4. Provide one of the following or equal:
1. "Keralastic/Kerabond" by Mapei Corporation.
2. "Hydroment Flex-A-Lastic #447/Tile Mate" by Bostik Construction Products Division.
3. "Laticrete 4237 with 211 Crete Filler Powder" by Laticrete International.

D. Bond Coat over gypsum board: Organic adhesive con forming to ANSI A136.1, Type I. Provide one of the following or equal:
1. "Ultra/Mastic 1" by Mapei Corporation.
2. "Hydroment 7001" Type 1 mastic by Bostik Construction Products Division.
3. "Laticrete 15 Mastic" by Laticrete International.

E. Grout for Ceramic Tile: Latex-Portland cement grout conforming to ANSI A118.6. Color of grout shall be selected by Architect. Provide one of the following or equal:
1. Plastijoints with Keracolor; by Mapei Corporation.
2. Hydroment Ceramic Tile Grout with Hydroment 428 Flexible Grout Admixture; by Bostik Construction Products Division.
3. Laticrete Sanded (500 Series) or Unsanded (600 Series) Grout and Joint Filler with Laticrete 1776 Grout Admix Plus; by Laticrete International.

F. Metal Edge Strips: Zinc alloy or stainless steel terrazzo strips, 1/8 inch wide at top edge with integral provision for anchorage to mortar bed or substrate.

2.05 MIXES

A. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers for accurately proportioning of materials, water or additive content, mixing

equipment and mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for applications indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
   1. Verify that substrates for setting tile are firm, dry, clean, and free from oil or waxy films and curing compounds.
   2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before jnstalling tile.
   3. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Maximum variation in surfaces to receive tile shall be as follows:
   1. prior to jnstalling floor tile, ensure surfaces are level, with maximum surface variation of 1/8 inch in 10 feet.
   2. prior to installing wall tile, ensure surfaces are plumb and straight, with maximum surface variation of 1/8 inch in 8 feet.

3.02 PREPARATION

A. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.03 INSTALLATION

A. Thinset Methods:
1. Install ceramic floor tile over the following floor substrates in accordance with ANSI A108.S using Latex portland cement mortar.
   a. Concrete: TCA Method F113.
   b. Concrete (Waterproof Membrane): TCA Method F122.
2. Install ceramic wall tile over the following wall substrates in accordance with ANSI A108.S using Latex portland cement mortar.
   a. Concrete Block: TCA Method W202.
   b. Cementitious Backer Board: TCA Method W244.
      1) Treat joints of cementitious backer board units to comply with manufacturer's instructions.
3. Install ceramic wall tile over gypsum board in accordance with ANSI A108.4 (TCA Method W223) using water-resistant organic adhesives.
4. Mix and proportion bond coat and grout materials in accordance with manufacturer's recommendations.

B. Thick Bed (Mud-Set) Methods:

1. Install ceramic tile over the following floor substrates in accordance with ANSI A108.1C using a Latex-Portland cement mortar:
   a. Concrete (Waterproof Membrane): TCA Method F121.

C. Waterproofing for Ceramic Tile Applications:
1. Install waterproofing in compliance with waterproofing manufacturer's instructions to produce a waterproof membrane of uniform thickness bonded securely to substrate.
2. Do not install tile over waterproofing until waterproofing has cured and has been flood tested to determine that it is watertight.

D. Thresholds: Install thresholds at locations indicated; set in same type of setting bed as abutting field tile.

E. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood or other flooring which finishes flush with top of tile.

F. Center and balance areas of tile, if possible.
1. An excessive amount of cuts shall not be made. Usually, no cuts smaller than half size should be made. Make all cuts on the outer edges of the field.
2. Smooth cut edges. Install tile without jagged or flaked edges.
3. Fit tile closely where edges will be covered by trim, escutcheons or other similar devices.
4. The splitting of tile is expressly prohibited except where no alternative is possible.

G. Maintain the heights of tile work in full courses to the nearest obtainable dimension where the heights are given in feet and inches and are not required to fill vertical spaces exactly.

H. Make corners of all tile flush and level with corners of adjacent tile, with due allowance to tolerances for tile. Form internal wall corners square and external corners bullnosed. Keep all joint lines straight and of even width, including miters.

I. Thoroughly back-up with thin-set bonding material all thin-set trim units, molded or shaped pieces and secure firmly in place.

J. Finish floor and wall areas level and plumb with no variations exceeding 1/8 inch in 8 feet from the required plane.
1. Sound tile after setting. Remove and replace hollow sounding units.

K. Allow tile to set for a minimum of 48 hours prior to grouting.
1. Grout ceramic tiles and ceramic mosaic tiles with Latex-Portland grout in accordance with grout manufacturer's instructions and ANSI A108.10.

3.04 FIELD QUALITY CONTROL

A. Close spaces in which tile is being set to traffic and other work. Keep closed until tile is firmly set.

B. Newly tiled floors shall not be walked on or worked on without using kneeling boards or equivalent protection of the tiled surface.

C. Tile setting materials shall not be applied to surfaces that contain frost. Tile shall not be installed in areas where the temperature is not maintained above 50 degrees F. or where the temperature of the backing is above 100 degrees F.

D. Completed installation shall be free of broken, damaged or faulty tile.

3.05 ADJUSTING

A. Correction of Defective Work: For a period of one year following Substantial Completion, return to the job and correct all defective work. Defective work includes, without limitation, tiles broken in normal use due to deficiencies in the setting bed, loose tile or loose grout and all other defects which may develop as a consequence of poor workmanship or defective materials.

B. Nothing in the above paragraph shall alter or reduce the Contractor's obligation to perform the Work of this Contract fully, or reduce the Owner's rights under law to recover damages during the full statutory period allowed for the Contractor's failure to perform.

3.06 CLEAN-UP

A. Keep work areas clean during progress of tile installation. Remove empty cartons and sweep out excess mortar and other debris daily.

B. Upon completion of setting and grouting, thoroughly sponge, and wash tile. Finally polish glazed tile with clean, dry cloths.

C. At completion of installation work, remove all tools, equipment, containers and debris from job and leave work areas broom clean.

D. Replace or restore work of other trades damaged or soiled by the tile work.

END OF SECTION 09 30 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. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each acoustical panel ceiling.

D. 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 pre-consumer 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 TYPE ACT-1

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 ACOUSTICAL PANELS TYPE ACT-2 **(NOT USED)**

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.; Ceramaguard Fine Fissured Perforated No. 607
2. Intended Use: Wet areas, shower rooms

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 0.90.

E. NRC: Not less than 0.55.

F. CAC: Not less than 38.

G. Edge/Joint Detail: 15/16” Square lay-in

H. Thickness: 5/8 inch.

I. Modular Size: 24 by 24 inches.

2.4 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 pre-consumer 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.

2.5 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.

2.6 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, post-installed 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 post-installed 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. Cushioned athletic flooring.
2. Vinyl composition floor tile
3. 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.

C. Product Certificates: Signed by manufacturers of resilient products certifying that each product furnished complies with requirements.

D. 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 tiles on flat surfaces. Do not stake boxes of tiles over 5 high.

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 postinstallation 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 one box of each type, color, pattern, class, wearing surface, and size of resilient tile flooring 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 RESILIENT TILE

A. Vinyl Composition Tile: Where this designation is indicated, provide vinyl composition floor tile complying with ASTM F 1066 and the following:
   1. Products: As follows:
      a. Tarkett: Expressions or equal
   2. Color and Pattern: As selected by Architect from manufacturer's full range of colors and as indicated on the drawings. Up to ten (10) colors shall be selected by the Architect.
      a. Residential living units: One color to be used within each unit.
      b. Corridors and Community Rooms: Multi-color patterns shall be used.
   3. Class: Class 2 (through-pattern tile).
   4. Static Coefficient of Friction: Level Surfaces, minimum 0.6.
   5. Thickness: 1/8 inch.
   6. Size: 12 by 12 inches.
   7. Application: Kitchen / Dinning Area
   8. Seaming Method: Heat welded.

2.3 CUSHIONED ATHLETIC FLOORING (RECYCLED RUBBER)

1. Manufacturer: Cycle (Roppe) – Contact Sales Master Flooring Solutions
2. Product: Cycle Recycled Rubber Flooring
3. Size: interlocking tiles 34 ¼" x 34 ¼"
4. Thickness: 5/16"
5. Installation: Full glue down with glued seams as recommended by manfacturer.
6. GC to verify suitability of substrate with manufacturer prior installation.

2.4 RESILIENT ACCESSORIES

A. Rubber 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. Roppe
b. Johnsonite.

2. Color and Pattern: As selected by Architect from manufacturer's full range of colors and patterns produced for rubber 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.

2.5 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated.

B. 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.

C. Urethane Waterproofing and Tile-Setting Adhesive: Manufacturer's standard proprietary product consisting of 1-part liquid-applied urethane in a consistency suitable for trowel application and intended for use as both waterproofing and tile-setting adhesive in a 2-step process.
1. Product: Hydroment Ultra-Set; Bostik.
2. For use with slip-resistant VCT only.

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. 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.

D. 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 TILE INSTALLATION

A. General: Comply with tile manufacturer's written installation instructions.

B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half of a tile at perimeter.
   1. Lay tiles square with room axis, unless otherwise indicated.

C. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.
   1. Lay tiles in basket-weave pattern with grain direction alternating in adjacent tiles.

D. Scribe, cut, and fit tiles 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 tiles 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, non-staining marking device.

G. Install tiles on covers for telephone and electrical ducts, and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on covers. Tightly adhere edges to perimeter of floor around covers and to covers.

H. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to comply with tile manufacturer's written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
   1. Provide completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

I. Hand roll tiles according to tile manufacturer's written instructions.

J. Provide waterproofing to set tiles where slip-resistant VCT is indicated on the drawings.

K. 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.

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 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. Wood.
3. 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. Non-flat 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. Non-flat 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 (Semi-gloss):

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 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.

D. Robe Hook: Where this designation is indicated, provide stainless-steel single robe hook complying with the following:
1. Products: B-671 by Bobrick

E. Toilet Paper Dispenser: Furnished by Owner, installed by Contractor.

F. Paper Towel Dispenser: Furnished by Owner, installed by Contractor.

G. Wall Mounted Soap Dispenser: Furnished by Owner, installed by Contractor.

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.

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 11 31 00

RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Cooking Appliances
   2. Refrigeration Appliances
   3. Cleaning Appliances

1.03 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, dimensions, furnished accessories, and finishes for each appliance.

B. Product Schedule: For appliances. Use same designations indicated on Drawings.

C. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

D. Warranties: Sample of special warranties.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

B. Regulatory Requirements: Comply with the following:

   1. NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1.05 WARRANTY

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

B. Refrigerator/Freezer, Sealed System: Limited warranty including parts and labor for first year and parts thereafter for on-site service on the product.
   1. Warranty Period for Sealed Refrigeration System: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 DROP-IN ELECTRIC RANGE

A. Basis-of-Design Product: Frigidaire 30" Drop-in electric range, Model #FFED3025P

B. Finish: Black

2.02 MICROWAVE OVEN

A. Basis-of-Design Product: Frigidaire Counter top Microwave, Model #FFCM1134L

B. Finish: Black

2.03 REFRIGERATOR/FREEZER

A. Basis-of-Design Product: Frigidaire Top Mount Refrigerator, 18 Cu. Ft., Model #FFHT1814Q

B. Finish: Black

2.04 DISWASHER

A. Basis-of-Design Product: Frigidaire 24" Built-in Dishwasher with adjustable height (for 34" countertop), Model #FDB2410HI.

B. Finish: Black

2.05 CLOTHES WASHER & DRYER

A. Basis-of-Design Product
   1. Washer: General Electric 4.3 Cu. Ft. capacity front load washer, Model GFWS1700HWW, Color: White
   2. Dryer: General Electric 7.5 Cu. Ft capacity front load electric dryer with steam & stainless steel drum, Model #GFDS170EH, with added indoor lint trap filter. Color: White.
   3. Condensate Ventless Dryer **(ADD ALTERNATE #3)**: Whirlpool Electric Heat Pump Dryer, Model #WED99HED, Color: White

2.04 GENERAL FINISH REQUIREMENTS

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. 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.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.02 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written instructions.

B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.

C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

D. Utilities: See Divisions 22 and 26 for plumbing and electrical requirements.

3.03 FIELD QUALITY CONTROL

A. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:
   1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
   2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
   3. Operational Test: After installation, start units to confirm proper operation.
   4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.

C. An appliance will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.04 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

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.

1.02 DEFINITIONS

A. Reviewed equal: Shall mean that the Engineer, not the contractor, shall make final determination whether materials are an equal to that which is specified.

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

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

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

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

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

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

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

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

J. Substitution: Shall mean materials of significantly different physical, structural or electrical requirements, performance, dimensions, function, maintenance, quality or cost, 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

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 Sprinkler System to provide coverage for new partition locations. The existing system must remain active until the new work is operational. Comply with requirements of all Authorities Having Jurisdiction. Comply with Local Sprinkler Ordinances. 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.

1. Automatic Sprinkler Systems 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 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.
   f. Locations of all partitions, with fire partitions noted.
   g. Occupancy class for each area and minimum density of water application.
   h. Locations of concealed spaces
   i. Plan showing location and size of city water main, where private main attaches, all valves, distance and elevation between main and riser.
   j. Recent hydrant test showing both static and residual pressures, and date and time taken. List any significant known daily or seasonal pressure fluctuations and the cause.
   k. Make, model and nominal K factor of sprinkler heads.
   l. Control valves, check valves, drain pipes and test connections.
   m. Fire department connections
   n. Details showing riser piping configurations.
   o. Pipe sizes.
   p. Switches and supervisory devices.

q. Interface with Fire Control Panel.

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 six (6) 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. Alarm check valves and trim.
c. Backflow preventer.
d. Valves and supervisory devices.
e. Sprinkler heads and escutcheon plates.
f. Supports, hangers and accessories.
g. Fire Department Connections.
h. 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. Building Occupancy: SCHOOL

B. Water Density and Square Foot Requirements: Provide per NFPA.

C. 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.

2.01 MANUFACTURERS

A. Match existing.

2.02 MATERIALS

A. Match existing.

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 SPRINKLER piping in finished areas shall be run concealed.

B. For aesthetic reasons, locate sprinkler heads neatly and symmetrically, relative to the walls, ceiling grid, diffusers and light fixtures. Center heads in tiles in suspended ceilings.

C. All piping shall be run as high as practicable. Pitch piping slightly to allow the system to be drained.

D. System drains shall be valved and piped to discharge. No valve shall be provided ahead of the electric alarm devices.

G. All sprinkler work shall avoid proposed locations of, and installation clearances for, lighting, ducts, piping, framing and equipment.

H. Paint any exposed sprinkler piping, color as selected by Owner.

3.04 COORDINATION

A. Coordinate work with that of other trades. Coordinate early for locations of mains. 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. Contact 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.

B. All tests shall be witnessed by the Owner's representative and local Fire Chief's representative. Submit copies of all test certificates, properly signed, to the Engineer.

END OF SECTION

SECTION 22 00 00

PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings, Addenda, General Provisions of Contract, including Division 1 General and Supplementary conditions and General Requirements apply to work specified in this Section.

1.2 DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

1.3 ALTERNATES

ADD Alt #2: change tub/shower to tile shower, see drawings.

1.4 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 and new addition, in accordance with these specifications and applicable drawings.

2. Provide the following:

   a. Sanitary, waste and vent systems.
   b Domestic cold and hot water systems.
   c. Pipe, valves and fittings
   d. Plumbing fixtures and accessories
   e. Water specialties
   f. Drainage specialties
   g. Insulation
   h. 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.

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

1.5 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.

1.6 CODES AND ORDINANCES

A. All work performed under this Section of the Specifications shall be done in accordance

with applicable Federal Laws, State Laws, State 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
IBC	International Building Code
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.

1.7 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, see Division 1. Submit full details for consideration and obtain written approval of the Architect. The phrase "or reviewed 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 a "reviewed 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 a "reviewed 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.

1.8 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 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. 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.

1.9 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.

1.10 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:

1.11 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, piping or ducts, 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.

1.12 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.

1.13 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 limited to:

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

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

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

4. Minor single phase electrical or control wiring between plumbing provided items that require it, unless indicated on the Division 16 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 (See paragraph 2.01), 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, most expensive, or most stringent, as decided by the Engineer of Record shall govern.

1.14 WORKPLACE SAFETY

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.

1.15 CHANGE ORDERS

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. 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.

1.16 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.

PART 2 - PRODUCTS

2.1 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 are not an equal to that specified.

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

2.2 MOTORS AND ELECTRICAL WORK

A. Provide and erect all motors, temperature controls, limit switches as specified.

B. Coordinate Power supply to switches, fused switches, outlets, motor starters, to 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 "ELECTRICAL Division" (Electrical Contractor). Coordinate all wiring between Mechanical/Plumbing and Electrical to provide a complete and operating system.

2.3 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.

2.4 SEISMIC RESTRAINT

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

2.5 IDENTIFICATION

A. Identify all new water and drain piping with “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.

B. 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.

C. 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.

2.6 INSULATION

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

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

B. Domestic Cold Water

Insulate cold water piping above grade with a minimum one half inch ½" thick fiberglass heavy density sectional pipe insulation system with minimum of 7 lb. density having a factory applied vapor barrier laminate all service ASJ jacket. Insulation jacket to have pressure sealing lap adhesive. Concealed piping, and piping in mechanical rooms may be well installed and sealed Armaflex Pipe Insulation with pressure sealing lap adhesive (or equal).

C. Domestic Hot Water & H.W. Recirculating

Insulate hot water and recirculating piping with fiberglass heavy density sectional pipe insulation system and a 450^{o} temperature rating with all service ASJ jacket. Longitudinal jacket flaps to be secured with flare type staples. Thickness as follows:

a. Hot water mains, recirculated hot water branches and recirculation returns: 1 inch thick.
b. Unrecirculated hot water branches: 1" thick.

D. Storm Water

1. Insulate any existing uninsulated storm water lines exposed during construction with one inch (1") thick insulation as specified for Domestic Water Piping above. If using cast-iron piping the insulation may be reduced to 1/2". Cut insulation to include hangers, then butt insulation tightly together and seal to prevent condensation points. Insulation shall be white where exposed.

E. 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.

F. Installation

All insulation work shall be executed by skilled insulation workmen regularly in the trade.

G. Covering

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

- OR -

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

2.7 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. 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°F:

	Soldered Ends	Screwed Ends
Milwaukee	BA-350S	BA-300S
Apollo	82-200	82-100
Watts	B-6081	B-6080
NIBCO	------	------
Hammond	8614	8604

2. 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

3. 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

2.8 DOMESTIC WATER PIPING

A. Service Lines

1. Connect to existing services in the building.

B. Interior Exposed, High temperature and Supportive

1. All exposed piping carrying domestic water, all piping with a temperature above 140 deg. F., all piping with a pressure exceeding 80 psi, all piping supporting inline equipment, and piping within 6 ft. of the water heaters, shall be hard-drawn type

"L" or type "K" 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 as indicated above, all sizes
2. Flowguard Gold CPVC pipe and fittings, all sizes.
3. PEX, sizes 3/4" and smaller
   a. Uponor AquaPEX (PEX-a) (cross linked polyethylene tubing) piping and cold expansion fittings, specifically designed for domestic water. ASTM F 876, Fittings for PEX Tube: ASTM F 1960, insert type and matching PEX tube dimensions. Manifold (if used): Uponor multiple-outlet, corrosion-resistant assembly.
   b. Piping shall be installed in a straight, neat and orderly manner. No wild spaghetti installations will be tolerated. Piping shall be run straight and parallel, and level or sloped slightly to low points with no droops exceeding 1/16". Use PEX bend supports to keep turns tight and steel channel supports to keep piping supported. Any work that in the opinion of the Architect or Engineer of Record that does not meet these standards will be removed and redone at the Contractor's expense.
   d. All PEX piping shall be insulated as indicated under Insulation. Use Armaflex insulation on piping run outs to individual fixtures to allow bending.
   e. Provide the correct spacing of hangers (w/ saddles) for PEX; every 3' or as recommended by the Manufacturer. Do not use the spacing designated for CPVC or copper piping unless using steel u-shaped support channels under insulation. Provide a support bracket at rough-ins.
   f. All work shall be done in accordance with the manufacturer's recommendations.
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.

2.9 SANITARY WASTE AND VENT PIPING

A. Drain Piping

EXCEPT WHERE INDICATED OTHERWISE, Piping and fittings shall be PVC Schedule 40 polyvinyl chloride plastic, as per ASTM-A-2665 or latest standard. Solvent as per ASTM-D-2564.

B. Plumbing Vent Piping,

All piping and fittings shall be PVC Schedule 40 polyvinyl chloride plastic, as per ASTM-A-2665 or latest standard. Solvent as per ASTM-D-2564.

2.10 STORM DRAIN PIPING (if any)

Same as sanitary waste above.

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

3. Masonry sleeves shall be Schedule 40 steel pipe.

B. 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

Coordinate with the Owner who may wish to supply some of the items.

A. LV-1 Lavatory, Wall Mounted - ADA

1. Fixture and faucet supplied by Owner.

2. Provide P-trap, chrome plated angle supplies, wheel stops, wrought escutcheons. Or reviewed equal. Must fit inside shroud/knee guard.

4. Provide concealed arms carrier as specified under Drainage Specialties.

B SK-1 Sink, Double Bowl, Counter

1. Fixture and faucet supplied by Owner..

2. McGuire chrome 1-1/2” P-trap, continuous waste, chrome plated angle supplies, wheel stops, wrought escutcheons. Or reviewed equal.

C SK-2 Sink, Single Bowl, Counter - ADA

1. Fixture and faucet supplied by Owner.

2. McGuire Prowrap insulated 1-1/2” P-trap, and supply covers, chrome plated angle supplies, wheel stops, wrought escutcheons. Or reviewed equal.

D. WC-1 Water Closet, Wall, Flush Valve - ADA

1. Fixture and flushvalve supplied by Owner.

2. Provide adjustable floor mounted carrier. Mount rim at 16-1/2"

2.13 EQUIPMENT OR PLUMBING FIXTURES BY OTHERS

Any equipment and fixtures supplied by other sections, will be provided and set in place by those sections (or the G.C.). This contractor will connect gas, compressed air, domestic hot water, waste and vent as required.

2.14 PLUMBING SPECIALTIES, DRAINAGE

A. Carriers

1. Wall hung fixtures including urinals and wall lavatories, 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 Watts or reviewed equal by Zurn, Smith, Josam or Wade.

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.

2. All traps under sinks and lavatories, and all piping and fittings shall be chrome-plated.

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, adjustable

Zurn Z-1400-BP-K, nickel bronze top, bronze plug, anchor flange.

2. Wall Cleanouts (WCO)

All wall cleanouts shall be Zurn Z-1445 cleanout tee with threaded plug. Polished nickel bronze cover, Zurn ZANB-1462 or reviewed equal by Watts, Smith, Josam or Wade.

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

A. 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.

2.16 ACCESS DOORS AND PANELS

A. Furnish General Contractor with 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 (minimum 12 inches by 16 inches). When required in corridors, lobbies or other habitable areas, they shall be located as directed by the Architect.

C. Access panels shall be as manufactured by Inland Steel Products Company "Milcor", Walsh-Hannon-Gladwin, Inc., "Way-Loctor", or reviewed equal. Types shall be as follows:

D. 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} and with cylinder locks. Units shall be factory primed for field painting by Section 09900.

PART 3 - EXECUTION

3.1 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.

3.2 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. Plumbing and Radon vents

a. Back vent all plumbing fixtures.
b. Pitch all vents at 1/32” 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
Cast-iron	At joints not to exceed 10'	15' or at each story whichever is less, and stacks at the base
Copper 1-1/4" & less	6'	6'
1-1/2"	6'	10'
2" & up	10’	10'
PVC, DWV	4’	4'
Steel	10’	10'

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.

3.3 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.

3.4 CLOSING IN UNINSPECTED WORK

A. Do not cover up or enclose work until it has been properly and completely inspected and approved.

B. 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.

3.5 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.

3.6 CLEANING

A. Prior to acceptance of the buildings, thoroughly clean all exposed portions of the this installation, removing all labels and all traces of foreign substance, using only a cleaning solution approved by the manufacturer of the plumbing item, being careful to avoid all damage to finished surfaces. Additional attention may be required to thoroughly clean any used, re-used or owner provided fixtures.

B. Clean out all strainers and aerators and adjust or replace washers, cartridges, etc

3.7 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.

3.8 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 Department of Environmental Protection.

3.9 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

1.1 RELATED DOCUMENTS

General Provisions of Contract, including General and Supplementary conditions and General Requirements (if any) apply to work specified in this Section.

1.2 DESCRIPTION OF WORK

A. Work Included

1. Furnish all labor, materials, equipment, transportation and perform all operations required to install a complete system

2. All temperatures are expressed in degrees Fahrenheit.

3. Work to be performed shall include, but is not limited to, the following:

   a. Provide and install a Kitchen Range Hood
   b. Provide and install a bathroom exhaust system
   c. Prove and install a ventless clothes dryer system
   d. Move existing heating thermostat
   e. Remove clean and reinstall existing ceiling grille.

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

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

7. Mechanical contractor shall be responsible for rigging to hoist his own (and his sub-contractors') materials and equipment into place.

8. Mechanical contractor and his sub-contractors shall be responsible for start-up of all equipment provided under this section..

1.3 PERMITS

This Contractor shall be responsible for providing and filing all Plans, Specifications and other documents, pay all requisite fees and secure all permits, inspections and approvals

necessary for the legal installation and operation of the systems and/or equipment furnished under this Section of the Specifications.

1.4 SHOP DRAWINGS & SUBMITTALS

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Review must be obtained on the following items:

1. Kitchen Exhaust Hood System
2. Bathroom Exhaust Fan

PART 2 - PRODUCTS

2.1 KITCHEN EXHAUST HOOD RH-1

A. Provide and install a fully integrated, pre-engineered fire suppression range hood systems. Greenheck GRRS-30-R-E-N or equal

Residential grade fire suppression: a hood suppression system that fulfills the 300A standard being designed to protect a residential-grade cooking appliance that is used within a commercial
space.

NSF Compliance: Equipment bears NSF Certification Mark (when required)

UL Listing: Equipment has been evaluated according to UL or ETL 300A and is labeled for intended use.

Fire-Protection Systems: to be pre-engineered and factory integrated into the design of the hood

B. The hood shall be constructed of 18 & 20 gauge (type 304) polished stainless steel. Hood shall have fire suppression system factory installed into the hood system. Activation of the mechanical fire suppression system shall be by 212 or 280-degree fusible link (30” vs. 36” sizes). Fire suppression agent will be Amerex 660 Low PH wet chemical suppressant. Unit shall include centrifugal fan with air delivery of 380 to 610 cfm depending of calibration of unit. Unit shall include fuel shutdown option for Gas, Electric or Dual Element Devices. The hood system will also have multiple alarm and monitoring contacts factory installed into the hood.

C. Verify CFM and pressure drop with manufacturer.

Greenheck Model	Width	Fan Type	Venting	CFM (at hood)
GRRS-30-R-E-N	30	Internal	Recirculating	500

D. Hood system include commercial-grade grease extractor type, high efficiency cartridge style baffle filters of adequate number and sizes to ensure optimum performance in accordance with manufacturer's published information. The filter housing shall terminate in a pitched, full-length grease trough, which shall drain into a removable grease container.

E. Shatter proof light fixtures shall be included in the hood system. Wiring shall conform to the requirements of the National Electrical Code (NEC #70).
1. Pre-Installed Fire protection system to provide duct entry, plenum, and surface protection for hood system and equipment located below ventilator.
2. System interconnected with included shunt trip breaker valve of equipment located below ventilator for power shutoff during system actuation.

E. Environmental Monitoring / Internal Monitoring / Pre-Suppression
Two temperature sensors are located on the inner face of the hood; one at a medium set point, the other at high. Under cooking conditions, when the medium set point is reached, the fan is turned on high. This feature dissipates the heat from the area but also draws it into the unit, past the fusible links in the system. If temperatures continue to rise and the high temperature set point is reached, the system reacts by shutting down power to the range prior to suppression system release. When this occurs, the unit's internal alarm is activated so that occupants are notified that the system is working to prevent further escalation of a potential fire. This is considered two stages of pre-suppression, where the unit is interacting with the cooking environment - working to minimize the risk of a fire event

Should temperatures continue to rise, fire is present. The fusible links will melt, mechanically actuating the suppression system and releasing a low PH wet chemical agent across the cook-top. At actuation, the system will also make a second attempt to shut down power to the range; in the event of a flash-fire, or something that happens too quickly to register with the temperature sensors. The system will continue to sound its internal alarm while also communicating a "fire code" back to a monitored alarm panel.

The PLC Self-Monitoring-System also monitors the entire suppression assembly for completeness and continuity. If the suppression system is ever compromised through a loss of pressure or broken connection, or tampering of any kind, the unit reacts by shutting down power to the range. In this case the suppression system is compromised therefor the range shouldn't be in use. Under this condition, the system communicates a separate "maintenance code" saying that the unit is down and needs service. When preemptive shutdown occurs, the system and the cooking equipment will not come back on-line until the GRRS is reset.

G. Options to be included with Hood
1. Handicapped Accessible Controls (ADA) – Separate control system designed to mirror the front-end controls of the hood, to be installed at under counter-top height.
2. NFPA101 Upgrade (NFPA101) – Combines MPK, CLBX and an upgraded fan to deliver >500cfm in order to comply with the requirements of the NFPA Life Safety Code.

H Field Testing
1. Functional Test: using manufacturer-supplied procedure, short internal sensors to demonstrate shutdown and communication features.
2. Puff Test: using manufacturer supplied test cylinder, replace suppressant cylinder in system with test (nitrogen only) cylinder. Replace fusible links in line with a "test link". Cut

the test link and allow the system to actuate, performing all of its standard functions.

I. Clean Up

1. At completion of the installation, clean and adjust equipment as required to produce ready-for-use condition.
2. Where stainless-steel surfaces are damaged during installation procedures, repair finishes in order to match adjoining undamaged surfaces.

2.2 CEILING EXHAUST FAN EF-1

A. General

1. Fans with capacity and types shown on the drawings shall be provided and installed. All roof curbs, unless otherwise noted, shall be provided by the fan manufacturer and installed by the General Contractor.

2. Wall cap shall not be provided with fans.

B. Types

1. EF-1 shall be ceiling mounted exhaust fan, Nutone QTXEN80 Fan or approved equal by Broan, Panasonic or Greenheck.

2.3 CLOTHES DRYER INDOOR VENT KIT

A. General

1. Provide and install a indoor hook-up Dreyer Vent Kit

2. Connect to Cloths Dryer shown on plan..

B. Type

1. Imperial Model VT005 or equal

2. Included accessories
-60” 4:” flexible hose
- with elbow
-Vent hood and extender
- Lint collector

2.4 SHEETMETAL

A. General

The work under this section includes all the required sheetmetal and duct work, extensions for grilles, manual dampers, automatic counterbalanced (backdraft) dampers, deflectors, setting of control dampers, grilles, registers, diffusers, flexible connections, fire dampers, and louvers, 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.

Dimensions of Longest Side (inches)	Minimum Sheet Metal Gauge
Up thru 12	26
13 --> 30	24

3. Methods of fabrication and installation shall be in strict accordance with guidelines set forth in the latest SMACNA Guide and Data Book for Low and Medium Pressure Duct Construction unless otherwise shown on drawings. Cross break all ducts with largest dimension being 18 inches and larger. Beaded ducts are not acceptable except for ductwork less than 18 inches in either direction.

4. All dampers and deflectors shall be a minimum of #22 gauge and stiffened as required. Splitter dampers shall not be acceptable.

5. All joints in ducts shall be made air tight, and all branches and turns shall be made with long radius elbows and fittings. Long radius elbows are defined as having a centerline radius of 1½ times the width of the duct.

   If long radius elbows in square or rectangular ducts are shown but not possible due to job conditions, consult the Architect prior to continuing. Upon approval to use square elbows, 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° 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. Unless specifically indicated not to, round ductwork may be substituted for rectangular if desired. The internal cross sectional area shall be not less then 95% of the cross sectional area of the rectangular duct it is replacing. 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 ducted air handlers and HRV unit. Connections shall be made from Ventglas neoprene coated glass fabric as furnished by Ventfabrics, Inc., or approved equal.

9. Every precaution shall be taken to keep interior of duct system free from dirt and rubbish and to protect all ducts and equipment during construction. At completion, this Mechanical Contractor shall thoroughly clean all equipment to the satisfaction of the Architect.

10. Spaces between ducts and wall or floor construction shall be caulked to make smoke and water tight 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 supersede SMACNA standards.

PART 3 – EXECUTION

3.1 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.

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3.2 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.

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END OF SECTION

SECTION 26 00 00

GENERAL REQUIREMENTS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.01 General Requirements

A. Definition of Work

Conditions of the Contract, Specifications, Change Orders, Addenda and Drawings apply to work of this section.

B. 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".

C. Existing Site Conditions – Responsibilities Prior to Bid

Before submitting a bid, Electrical Contractor is required to make a pre-bid site 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.

D. Existing Site Conditions – Responsibilities Prior to Starting Work

Before starting work in a particular area of the project, the Electrical Contractor 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.

E. Coordination of Work

The Electrical Contractor shall coordinate the work of all trades and, with all other subcontractors to determine whether there will be any interference with the electrical work. If 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.

F. Discrepancies in Documents

Each bidder shall be responsible for examining the 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 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 the specification, the Electrical Contractor 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 Contract Documents to be final. No additional compensation will be approved because of discrepancies thus resolved.

1.02 Applicable Codes and Standards

A. 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) - 2014
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.

B. 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 Contractor 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.

1.03 Contract Documents

A. Work to be Provided

Work to be provided under this division is shown on the Electrical Drawings, General Requirements, and in these Contract Specifications.

B. 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 Contractor 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 Contractor 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.

C. 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.

D. 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 Contractor 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 Contract Documents to be final. No additional compensation will be approved because of discrepancies thus resolved.

E. 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 Contractor 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.

F. Efficiency Maine

This project intends to pursue Efficiency Maine (EM) prescriptive and/or custom incentives where applicable. The Electrical Contractor shall coordinate the activities associated with Efficiency Maine incentive approval process including but not limited to; preparation and submission of all applicable incentive applications receiving pre-approval when applicable, the tracking and submission of measure specific invoices to Efficiency Maine within 60 days of the completion of the work, and follow-up as necessary until Portland Public Schools receives the incentives.

1. The Electrical Contractor shall also:
   a. Become familiar with the Efficiency Maine Business Program including available incentives and the application and review process.
   b. Review the specifications and field conditions for compliance with Efficiency Maine standards for applicable systems and technologies.
   c. Review the specifications for any and all incentive opportunities, prescriptive and custom.
2. The project schedule shall reflect and accommodate the time required to achieve application preapproval from EM. No equipment shall be purchased until preapproval is received from EM.
3. All invoices shall be forwarded to EM and the Owner within 60 days of the completion of work. This deliverable shall be shown on the project schedule as a milestone date and coordinated with all contractors to assure compliance with this requirement.
4. Efficiency Maine is available to assist in the application process and can be reached at 866-376-2463. Electrical Contractor must contact EM prior to submittals to review the project equipment and scope.

PART 2 - SCOPE OF WORK

2.01 General Requirements

A. 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.

B. Administrative Responsibilities

The Electrical Contractor 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.

2.02 Work to be Provided Under this Division

A. 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 Contractor shall provide:

1. **Grounding System:** Furnish an equipment grounding conductor for each feeder and branch circuit.
2. **Power Distribution Systems:** Provide power and lighting distribution systems for the areas, including breakers in existing panelboards (if required), receptacles, raceway, cable and wire.
3. **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.
4. **Motor Circuit Wiring:** Provide all motor wiring, safety disconnects, and motor starters unless integral with equipment.
5. **Interior Lighting Systems:** Provide interior lighting system and devices including normal and emergency fixtures, exit signs, lamps, controls, trim and accessories.
6. **Control Wiring:** Provide control wiring not provided by Division 23.
7. **Supports and Fittings:** Provide all support material and hardware for raceway, cable tray and electrical equipment.
8. **Terminations:** Provide terminations of all cable and wire unless otherwise noted.
9. **Penetrations:** Provide all building wall, floor and roof penetrations for raceway and cable tray where not provided by the General Contractor.
10. **Demolition:** Demo existing receptacle or switch. Remove wiring back to panel.
11. **Other Items Furnished By Others:** Install the following equipment furnished by others:
    a. Motors
    b. Control Panels

2.03 Work not Included Under this Division

A. Related Work Included in Other Sections

The following work is not included in this Section and shall be performed under other sections:

1. Excavation and backfill.
2. Concrete work, including concrete housekeeping pads and other pads and blocks for vibrating and rotating equipment.
3. 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.
4. Installation of access panels in ceilings and wall construction.
5. Painting, except as specified herein.
6. Outdoor air intake or exhaust louvers.
7. Control wiring specifically indicated as part of Division 23.

2.04 General Equipment and Materials Requirements

A. General Requirements

All equipment and materials shall be new (with the exception of those lighting fixtures designated to be reused) 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. Remove from job site and properly dispose of all materials that are not being reused. NOTE: OWNER HAS THE OPTION TO KEEP ANY OF THE REMOVED MATERIAL AND EQUIPMENT.

B. Representation of Equipment

All equipment installed on this project shall have local representation, local factory authorized service, and a local stock of repair parts.

C. Warranties

No equipment or material shall be installed in such a manner as to void a manufacturer’s warranty. The Electrical Contractor shall notify the Engineer of any discrepancies between the Contract Documents and manufacturer's recommendations prior to execution of the work. Provide Owner with a one year warranty on all parts and labor. Provide the Owner with any and all standard warranties from the manufacturer.

2.05 Shop Drawings

A. General Requirements

After the Contract is awarded, but prior to proceeding with the Work, the Electrical Contractor 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 Contractor shall review and certify that the shop drawings, product data, and samples are in compliance with the Contract Documents. Further, the Electrical Contractor 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.

B. 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.

C. 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.

D. 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 Contractor from responsibility for errors or omissions in such drawings.

E. Proposal of Other Equipment

If the Contractor 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.

F. 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.

2.06 Record Drawings

A. General Requirements

As work progresses, and for duration of the Contract, the Contractor 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 Contractor shall submit a complete set of reproducible record drawings showing all systems as actually installed.

B. Operation and Maintenance Data

Provide manufacturer’s printed operating procedures to include start-up, break-in, routine and normal operation instructions; regulation control, stopping, shut-down, and emergency instructions. Provide copies of all warranties.

C. Equipment Specifications

1. Panelboards: The intent is to reuse existing panelboards and provide additional breakers as shown on the plans.

   a. Circuit Breakers: Overcurrent devices shall be trip-free molded case, bolt-on, thermal magnetic circuit breakers. Front faces of all circuit breakers shall be flush. Trip indication shall be clearly shown by the handle position between the ON and OFF positions. All connections shall be rated for 75ºC copper conductors.

2. Grounding System

   a. A green equipment grounding conductor shall be run with each branch circuit.

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 wiring shall be copper, minimum size #12 AWG. Conductors shall be 600V rated with THHN, THWN or XHHW insulation. A green equipment grounding conductor shall be run with each branch circuit.

   c. All exposed wiring shall be in EMT conduit. Wiring above acoustic ceiling tiles and in walls shall be part of an MC cable assembly.

d. All conduits or penetrations in fire rated walls shall be furnished with fire stopping material to maintain the integrity of the rating.

e. All conduits penetrating the roof or exterior walls shall be furnished with watertight seals.

4. Motor Circuit Wiring: Provide all motor wiring, safety disconnects, and motor starters unless integral with equipment.

a. 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.

D. Lighting Systems:

1. 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 lighting fixtures of sizes, types and ratings indicated and specified in the Lighting Fixture Schedule on the Contract Drawings.

2. 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.

3. 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.

a. Passive Infrared Wall-Mount Sensors: Wall mounted occupancy sensors shall be suitable for dual circuit operation as specified on the contract drawings.

b. Ultrasonic/Infrared Ceiling-Mounted Sensors: Ceiling mounted occupancy sensors shall be self-calibrating type as specified on the contract drawings.

c. Power Packs: Power packs shall be provided as required for each room provided with occupancy sensors as needed.

d. Slave Relay Packs: Slave relay packs shall be provided in rooms with more than one lighting circuit controlled by the occupancy sensor.

e. Installation Requirements: Provide all miscellaneous equipment and wiring for a complete installation.

E. Fire Alarm Systems:

1. In this electrical scope, new Fire Alarm devices shall be placed as shown on the Electrical Plans. Candela ratings of strobes shall be sized as per NFPA 72 requirements.

2. Coordinate all fire alarm system devices and wiring with the Owner or the Owner's Representative. All existing devices shown shall be compliant for use with the existing Fire Alarm Control Panel. The Electrical Contractor shall also be responsible for coordinating all work with the Authority Having Jurisdiction (AHJ) and providing all equipment and devices that may be required for Fire Department/AHJ Approval, whether shown on the plans or not.

PART 3 – EXECUTION

2.01 Wiring Methods

A. General

Perform work by qualified journeymen if their respective trades who are employed by a firm that can demonstrate successful experience with work similar in type, quality and extent to the work required by this project.

B. Requirements

Unless otherwise noted all wiring shall be installed in raceway as follows:

1. **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.

2. **Fire Alarm Wiring:** Shall be installed in EMT where exposed and MC cable where concealed.

2.02 Equipment Arrangement and Access

A. 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.

2.03 Equipment Labeling

A. 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.

B. 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.

C. 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.

2.04 Temporary Light and Power

A. Requirements

The intent is to use the existing power and lighting in the area for temporary light and power. All such temporary electrical work shall meet the requirements of OSHA. The General Contractor and all subcontractors, individually, shall furnish all extension cords, portable lights and lamps as required for their work.

B. Reimbursable Items

The General Contractor and all subcontractors shall reimburse the Electrical Subcontractor for any temporary wiring of a special nature, other than that specified above, required for their work.

C. 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

3/18/2018

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Permitting and Inspections Department
Michael A. Russell, MS, Director

Commercial Interior Alteration Checklist

(Including change of use, tenant fit-up*, amendment and/or interior demolition)

All applications shall be submitted online via the Citizen Self Service portal. Refer to the attached documents for complete instructions. The following items shall be submitted (please check and submit all items):

Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
06/28/2018

- ☒ **Commercial Interior Alterations Checklist** (this form)
- NA ☐ **Plot plan/site plan** showing lot lines, shape and location of all structures, off-street parking areas and noting any dedicated parking for the proposed business
- NA ☐ **Proof of Ownership or Tenancy** (If tenant, provide lease or letter of permission from landlord. If owner, provide deed or purchase and sale agreement if the property was purchased within the last 6 months.)
- NA ☐ **Key plan** showing the location of the area(s) of renovation within the total building footprint and adjacent tenant uses
- NA ☐ **Life Safety Plan** drawn to scale, showing egress capacity, any egress windows, occupancy load, travel distances, common path distance, dead end corridor length, separation of exits, illumination and marking of exits, portables fire extinguishers, fire separations and any fire alarm or fire sprinklers systems
- ☒ **Existing floor plans/layouts** drawn to scale, including area layout, removals, exits and stairs
- ☒ **Proposed floor plans/layouts** drawn to scale, including dimensions, individual room uses and plumbing fixtures

Please note: All plans shall be drawn to a measurable scale (e.g., 1/4 inch = 1 foot) and include dimensions. Construction documents prepared and stamped by a licensed architect or engineer shall be required for certain projects in accordance with the stated Policy on Requirements for Stamped or Sealed Drawings.

Additional plans may also require the following *(As each project has varying degrees of complexity and scope of work for repairs, alterations and renovations, some information may not be applicable. Please check and submit only those items that are applicable to the proposed project.):*

- NA ☐ **Code information** including use classifications, occupant loads, construction type, existing/proposed fire alarm, smoke and sprinkler protection systems, egress (exits and windows), fire separation areas and fire stopping
- ☒ **Demolition plans and details for each story** including removal of walls and materials
- ☒ **Construction and framing details** including structural load design criteria and/or non-structural details
- NA ☐ **New stairs** showing the direction of travel, tread and rise dimensions, handrails and guardrails
- ☒ **Wall and floor/ceiling partition types** including listed fire rated assemblies
- ☒ **Sections and details** showing all construction materials, floor to ceiling heights, and stair headroom
- ☒ **New door and window schedules** (include window U-factors)
- ☒ **Accessibility features and design details** including the Certificate of Accessible Building Compliance
- ☒ **Project specifications manual**
- NA ☐ **A copy of the State Fire Marshal construction and barrier free permits.** For these requirements visit: http://www.maine.gov/dps/fmo/plans/about_permits.html

Food service occupancies require additional plans and details for review, such as occupant load per square foot area for tables and chairs, number of fixed bar, banquet and booth seating, equipment and plumbing fixture plans with schedule, hood location and interior finish materials. Accessible seating and counter details shall be included, please refer to this site: http://www.alphaonenow.org/userfiles/resto_access_sheet.pdf

Separate permits are required for internal and external plumbing, electrical installations, heating, ventilating and air conditioning (HVAC) systems, appliances and commercial kitchen hoods.

*Tenant fit-up: construction necessary within the demising walls of a leased space, including partitions, finishes, fixtures, lighting, power, equipment, etc. making the interior space suitable for the intended occupation.

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Permitting and Inspections Department
Michael A. Russell, MS, Director

Certificate of Accessible Building Compliance

All facilities for the use of a public entity shall be readily accessible by individuals with disabilities.

Project Name: Deering High School FLS

Project Address: 370 Stevens Av.

Classification: ○ Title II (State/Local Government) ◉ Title III (Public Accommodation/Commercial Facility)

Reviewed for Code Compliance
Permitting and Inspections Department
Approved with Conditions
06/28/2018

○ **New Building**
- ☐ Americans with Disabilities Act (ADA)
- ☐ Maine Human Rights Act (MHRA)
  - ☐ Barrier Free Certification ($75,000+ scope of work)
  - ☐ State Fire Marshal Plan Review Approval

◉ **Alteration/Addition**
- ☑ Existing Building Completion date:
  - ☐ Original Building: not known
  - ☐ Addition(s)/Alteration(s): circa 1982
- ☑ Americans with Disabilities Act (ADA)
  - Path of Travel ○ Yes ◉ No
- ☑ Maine Human Rights Act (MHRA)
  - ☐ Exceeds 75% of existing building replacement cost
  - ☑ Barrier Free Certification ($75,000+ scope of work)
  - ☐ State Fire Marshal Plan Review Approval

○ **Occupancy Change/Existing Facility**
- ☐ New Ownership – Readily Achievable Barrier Removal: _____

○ **Residential**
- ☐ Americans with Disabilities Act (ADA)
- ☐ Fair Housing Act (4+ units, first occupancy)
- ☐ Maine Human Rights Act (MHRA)
  - ☐ Covered Multifamily Dwelling (4+ units)
  - ☐ Public Housing (20+ units)
- ☐ Uniform Federal Accessibility Standards (UFAS)
- ☐ None, explain: _____

Contact Information:

Design Professional:

Manon Lacombe - Winton Scott Architects

Signature
(*This is a legal document and your electronic signature is considered a legal signature per Maine state law.*)

Name: Manon Lacombe

Address: Winton Scott Architects
5 Milk Street, Portland, ME

Phone: 207-774-4811

Maine Registration #: ARC3326

Owner:

Douglas Sherwood - Portland Schools

Signature
(*This is a legal document and your electronic signature is considered a legal signature per Maine state law.*)

Name: Douglas Sherwood

Address: Portland Schools
353 Cumberland Ave, Portland, ME

Phone: _____