CLAGGETT CENTER
BARN REVITALIZATION
and Addition

ADAMSTOWN, MARYLAND

Project No. 20220

Artistic rendition of Project- actual details may vary from that shown above

PROJECT MANUAL

Prepared By
Grove & Dall'Olio Architects PLLC
and
Douglass C. Reed, Historic Structures Consultant

October 1, 2021

PROJECT TEAM

Owner
The Claggett Center
James Ryder, Co-Executive Director
3035 Buckeystown Pike
Adamstown, MD 21710
(301) 874-5147 ext. 1436

Owner's Representative
Douglass C. Reed
Historic Structures Consultant
301-730-2699

Architect
Grove & Dall'Olio Architects PLLC
325 Migration Lane
Gerrardstown, WV 25420
(304) 267-2120

Mechanical Engineer
Comfort Design, Inc.
620 Pennsylvania Avenue
PO Box 3273
Winchester, VA 22601
(540) 665-2846

Structural Engineer
Matonak & Associates
931-B Sweeny Drive
Hagerstown, MD 21740
(301) 790-0111

TABLE OF CONTENTS

Specifications

012200	Unit Prices	10/1/21
013233	Photographic Documentation	10/1/21
013591	Historic Treatment Procedures	10/1/21
022000	Earthwork	10/1/21
024119	Selective Structure Demolition	10/1/21
027120	Foundation Drainage Systems	10/1/21
033000	Cast-In-Place Concrete	10/1/21
033460	Concrete Floor Finishing	10/1/21
035500	Decorative Concrete Slab Finishes	10/1/21
040120	Restoration of Historic Masonry	10/1/21
040523	Drainage Fabric	10/1/21
042000	Unit Masonry	10/1/21
051200	Structural Steel	10/1/21
061000	Rough Carpentry	10/1/21
061200	Insulated Panels	10/1/21
061340	Timber Frame Restoration and Repair	10/1/21
072113	Thermal and Acoustical Insulation	10/1/21
062013	Exterior Finish Carpentry	10/1/21
062000	Finish Carpentry	10/1/21
076200	Flashing & Sheet Metal	10/1/21
079000	Sealants	10/1/21
081113	Hollow Metal	10/1/21
082000	Wood Doors	10/1/21
083500	Access Doors	10/1/21
084213	Aluminum Framed Entrances	10/1/21
084313	Aluminum Storefronts	10/1/21
085400	Fiberglass Awning Windows	10/1/21
085550	Historic Wood Window-Vent Restoration	10/1/21
087000	Hardware	10/1/21
088000	Glass & Glazing	10/1/21
092500	Gypsum Drywall	10/1/21
093000	Ceramic Tile	10/1/21
095000	Acoustic Ceiling	10/1/21
099113	Exterior Painting	10/1/21
099123	Interior Painting	10/1/21
099313	Interior and Exterior Stains	10/1/21
104000	ADA Signage	10/1/21
104413	Fire Extinguisher Cabinets	10/1/21
108000	Bath Accessories	10/1/2
142500	Hydraulic Elevator	10/1/21

ARCHITECTURAL

STRUCTURAL

MECHANICAL

End of Table of Contents

Claggett Center Barn
October 1, 2021

TABLE OF CONTENTS

INVITATION TO BID

The Claggett Center invites proposals from only pre-qualified bidders to provide all work, including, but not limited to, labor, material, equipment, supplies and transportation for:

The Claggett Center Barn Revitalization
The Claggett Center
3035 Buckeystown Pike
Adamstown, MD

All Bids must be submitted in accordance with the Bidding Documents issued by Grove & Dall'Olio Architects PLLC. Bidding Documents will be distributed electronically by the Owner's Representative:

Douglass C. Reed
TA as Preservation Associates

A pre-bid meeting is scheduled for:

TIME: 9:30 AM
DATE: Wednesday, October 13,2021
PLACE: Claggett Center Barn
3035 Buckeystown Pike, Adamstown, MD

Attendance is **Mandatory** unless there is a compelling reason why the date does not work. The Pre-bid Meeting will allow Contractors to familiarize themselves with the project location, site conditions and other relevant information. If any Bidder is unable to attend the meeting contact Doug Reed at 301 730-2699 for access to the site.

Questions must be submitted to both the Architect AND the Owner's Representative via email at Lisa@GDAaia.com AND doug@preservationassociatesinc.com up until 72 hours prior to the Bid Due Date/Time. All Bids must be submitted in accordance with the Bidding Documents by **4:00 PM, on Friday, October 29, 2021.**

Sealed bids will be received by the **OWNER** at the following location:

James Ryder
Co-Executive Director
The Claggett Center
3035 Buckeystown Pike
Adamstown, MD 21710
Tel. 301-874-5147 ext. 1436

Owner reserves the right to reject any and all bids without cause or reason.

END OF INVITATION TO BID

FORM OF PROPOSAL

To Owner: **The Claggett Center**

Project: **Claggett Center Barn Revitalization**

Having carefully examined the drawings, specifications, the Scope of Work and associated Bid documents dated October 1, 2021 in addition to any and all Addenda, as prepared by Grove & Dall'Olio Architects PLLC, 18 West Boscawen Street, Winchester, VA, as well as having visited the site and observed conditions affecting the work, propose to finish all material, equipment, labor, machinery, tools, supplies, services, applicable taxes and specified insurance necessary to perform the entire work, as set forth in accordance with said documents within the time set forth below:

Name, Title: _____
(Please Type or Print)

Firm Name: _____ Corporate Seal if Applicable

Firm Address: _____

_____

_____

Telephone: _____ Fax:_____

Contractor's Maryland License No.: _____

Contractors engaged in work at the Claggett Center must be licensed contractors in the State of Maryland and their company must have a business license from Frederick County.

Addenda Acknowledgement

The undersigned hereby acknowledges receipt of the following Addenda and has taken the information contained therein into full consideration in the formulation of this Bid.

Addenda No. 1 _____ **Addenda No. 3** _____

Addenda No. 2 _____ **Addenda No. 4** _____

Failure to acknowledge receipt of each Addendum may be cause for rejection of the Bid.

Signature: _____ Date: _____
(Signature in Ink of person who is an authorized signatory to the proposal and binding on the company to perform work if the company is awarded the bid)

Proposal

The undersigned, hereinafter called the Bidder, being familiar with and understanding the Bidding Documents and also having examined the site and being familiar with all local conditions affecting the Project hereby proposes to furnish all labor, material, equipment, supplies and transportation, and to perform all Work in accordance with the Bidding Documents within the time set forth in the Supplementary Instructions To Bidders for the sum of:

_____dollars $_____

(Amount to be shown in both words and numbers. In the event of a difference between the written and the number amount, the written amount shall prevail.)

CONTRACTOR'S LICENSE

The State of Maryland requires that all persons desiring to perform contractual work in this State must be duly licensed. The successful Bidder will be required to furnish a copy of its contractor's license prior to issuance of a Purchase Order/Contract. Please attach as EXHIBIT B to the BID.

Contractor is to submit with their bid documentation that confirms they are in good standing with the Maryland State Workers Compensation regulatory office.

List of Subcontractors

If awarded the Contract, we will employ the following subcontractors for portions of work not performed directly by undersigned.

Name	Trade	Phone Number

Bid breakdown

General Conditions..... _____

Sitework..... _____

Concrete Slab and Foundations..... _____

Unit Masonry ..... _____

Masonry Restoration ..... _____

Timber Restoration..... _____

Rough Carpentry ..... _____

Finish Carpentry ..... _____

Roofing & Accessories ..... _____

Flashing & Sheet Metal ..... _____

Insulation ..... _____

Doors, Door Frames, Windows & Hardware (exclude vents)..... _____

Vent Restoration..... _____

Storefront System and associated glazing ..... _____

Gypsum Drywall ..... _____

Ceramic Tile ..... _____

Wood Flooring ..... _____

Concrete Slab Finishing ..... _____

Acoustical Ceilings ..... _____

Painting ..... _____

Elevator ..... _____

Electrical..... _____

Mechanical ..... _____

Plumbing..... _____

Misc..... _____

Respectfully Submitted:

Signature: _____ Date: _____

(Signature in Ink of person who is an authorized signatory to the proposal and binding on the company to perform work if the company is awarded the bid)

Name: _____

END OF FORM OF PROPOSAL

SECTION 012200 - UNIT PRICES

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. Section includes administrative and procedural requirements for unit prices.

B. Related Sections:

1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Division 01 Section "Quality Requirements" for general testing and inspecting requirements.
3. Division 04 Section "Stone removal and replacement" unit pricing.
4. Division 04 Section "Repointing stonework" unit pricing.

1.3 DEFINITIONS

A. Unit price is a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes**,** overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1: Stone removal and replacement.

1. Description: There are areas of historic stones in stable level stone walls that need to be carefully cut out and replaced in accordance with Division 04 Section "Maintenance of Unit Masonry."
2. Unit of Measurement: Square Foot

B. Unit Price No. 2: Deconstruction of the two ramp cheek walls.

1. Description: The two concrete encased stone cheek walls that retain the ramp need to be deconstructed, the historic stone cleaned and used to restore stable level foundation stone walls in accordance with Division 04 Section "Maintenance of Unit Masonry." Should the stone prove unable to be cleaned, provide a unit price for new stone.
2. Unit of Measurement: Cubic Foot

C. Unit Price No. 3: Rock Removal

1. Description: There are areas under the stable level walls and floors that need to be excavated for underpinning and duct placement. Should solid rock be encountered at these locations, provide a price for rock removal. No blasting may be used.
2. Unit of Measurement: Cubic Yard

END OF SECTION 012200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

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. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.

1.3 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files on USB or SD card within 20 business days of taking photographs.

1. Digital Camera: Minimum sensor resolution of 12 megapixels.
2. Format: Minimum 1600 by 1200 pixels, 300 dpi minimum, in unaltered original files, with same aspect ratio as the sensor, uncropped, accurately dated and time-stamped, in folder named by date of photograph, accompanied by key plan file.
3. Identification: Provide the following information with each image description in file metadata tag:

a. Name of Project.
b. Name and contact information for photographer.
c. Name of Contractor
d. Date photograph was taken.
e. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
f. Unique sequential identifier keyed to accompanying key plan.

1.4 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 1600 X 1200 pixels and 300 dpi.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.
2. Field Office Images: Maintain one set of images accessible at Project site, available at all times for reference. Identify images in the same manner as those submitted to Consultant.

C. Final Completion Construction Photographs: Take 30 or more digital photographs after date of Substantial Completion for submission as project record documents. Consultant will inform photographer of desired vantage points.

1. Do not include date stamp in final photographs.

END OF SECTION 013233

SECTION 013591 - HISTORIC TREATMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general protection and treatment procedures for entire Project and the following specific work:

1. Removal and dismantling of existing historic materials.

1.2 DEFINITIONS

A. Consolidate: To strengthen loose or deteriorated materials in place.

B. Dismantle: To disassemble and detach items by hand from existing construction to the limits indicated, using small hand tools and small one-hand power tools, so as to protect nearby historic surfaces; and legally dispose of dismantled items off-site, unless indicated to be salvaged or repaired and reinstalled.

C. Existing to Remain: Existing items that are not to be removed or dismantled.

D. Historic: Spaces, areas, rooms, surfaces, materials, finishes, and overall appearance which are important to the successful preservation and rehabilitation of the main barn structure as determined by the Consultant. Designated historic spaces, areas, rooms, and surfaces are listed as follows:

1. The entire interior and exterior of the barn including the stone foundation, timber framing, vents, doors and siding that enclose the barn. The barn as it exists is an historic structure of significant value and represents a major zone of restoration and preservation.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by the Historic Structure Consultant.

F. Paintable Stable Base: To remove existing finish down to base material allowing the primer coats to remain if the existing primer coats do not exhibit any cracking, peeling or crazing in the primer layers present. Refer to "Strip" below.

G. Reconstruct: To remove existing item, replicate damaged or missing components, and reinstall in original position.

H. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

I. Reinstall: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.

J. Remove: Specifically for historic spaces, areas, rooms, and surfaces, the term means to detach an item from existing construction to the limits indicated, using hand tools and, only where appropriate, hand-operated power equipment, and legally dispose of it off-site, unless indicated to be salvaged or reinstalled.

K. Repair: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. Includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

L. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

M. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

N. Reproduce: To fabricate a new item, accurate in detail to the original, and in either the same or a similar material as the original, unless otherwise indicated.

O. Restore: To consolidate, replicate, reproduce, repair, and refinish as required to achieve the indicated results.

P. Retain: To keep existing items that are not to be removed or dismantled.

Q. Reversible: New construction work, treatments, or processes that can be removed or undone in the future without damaging historic materials unless otherwise indicated.

R. Salvage: To protect removed or dismantled items and deliver them to Owner.

S. Stabilize: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.

T. Strip: To remove existing finish down to base material unless otherwise indicated.

1.3 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to building materials from the original construction periods, items found in the soils anywhere on the property and other items of interest or value to Owner that may be encountered during removal and dismantling work remain Owner's property. Carefully dismantle and salvage each item or object.

B. Coordinate with Owner's Consultant, who will establish special procedures for dismantling and salvage.

1.4 SUBMITTALS

A. Construction Schedule for Historic Treatments: Indicate for the entire Project the following for each activity to be performed in historic spaces, areas, and rooms, and on historic surfaces:

1. Detailed sequence of historic treatment work, with starting and ending dates, coordinated with Owner's continuing operations and other known work in progress.

B. Qualification Data: Turn in a vitae/resume for historic removal and dismantling specialist firm, historic removal and dismantling specialist's field supervisors, historic removal and dismantling specialist's workers.

1.5 QUALITY ASSURANCE

A. Historic Removals and Dismantling Specialist Qualifications: Engage an experienced**,** preapproved firm to perform work of this Section. Firm shall have completed work on buildings and materials similar in age (mid 19th century), materials (including, but not limited to brick, stone, mortar and woods), design, and extent to that indicated for this Project with a record of successful in-service performance. The firm must have a minimum 5 years of successful completion of this type of work. Individuals who are lead and journeyman level removals and dismantling specialists who will actually perform the work on the barn must also have a minimum of 5 years of successful completion of this type of work. Vitaes/resumes must be submitted for the firm and each worker who will perform work on the removals and dismantling portions of the barn.

1. Field Supervisor Qualifications: Full-time supervisors experienced in historic treatment work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on Project site during times that historic treatment work is in progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.
2. Worker Qualification: Persons who are experienced in historic treatment work of types they will be performing.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by historic treatment operations.

C. Inventory of Salvaged Items: After removal or dismantling work is complete, submit a list of items that have been salvaged.

D. Comply with the recommendations of the National Park Service Preservation Briefs for treatment of various historic materials required for the Work unless otherwise directed by the Consultant.

E. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-prevention devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include each fire watch's training, duties, and authority to enforce fire safety.

F. Regulatory Requirements: Comply with notification regulations of authorities having jurisdiction before beginning removal and dismantling work. Comply with hauling and disposal regulations of authorities having jurisdiction.

G. Standards: Comply with ANSI/ASSE A10.6.

1.6 STORAGE AND PROTECTION OF HISTORIC MATERIALS

A. Salvaged Historic Materials:

1. Clean only loose debris from salvaged historic items unless more extensive cleaning is indicated.
2. Store salvage items to be repaired and reinstalled in a secure area until item is needed for reinstallation in the barn structure.
3. Store items to be salvaged but not reused in the barn in a secure area until delivery to Owner. Owner will remove items from the site after salvage.

B. Historic Materials for Reinstallation:

1. Repair and clean historic items as indicated and to functional condition for reuse.
2. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make item functional for use indicated.

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect and/or Consultant, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.

D. Storage and Protection: When taken from their existing locations, catalog and store historic items within a weathertight enclosure where they are protected from wetting by rain, snow, condensation, or ground water, and from freezing temperatures.

1. Identify each item with a nonpermanent mark to document its original location. Indicate original locations on plans elevations, sections, or photographs by annotating the identifying marks.
2. Secure stored materials to protect from loss or theft.

1.7 PROJECT CONDITIONS

A. 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 Consultant and Owner. Owner will remove hazardous materials under a separate contract.
2. Paint has not been tested but is anticipated to contain lead. See Section 3.8 of this Section and 099113 Exterior and Interior Painting for instructions regarding lead paint.

B. Storage or sale of removed or dismantled items on-site is not permitted.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 HISTORIC REMOVAL AND DISMANTLING EQUIPMENT

A. Removal and Dismantling Equipment: Use only manual, hand-held tools except as follows or unless otherwise approved by the Consultant on a case-by-case basis:

1. Light and/or large air hammers are not permitted.
2. Cutting torches and other open flame devices and tools are not permitted on the project for any reason.
3. Hand-held power tools and cutting torches are permitted only as submitted in the historic treatment program. They must be adjustable so as to penetrate or cut only the thickness of material being removed.
4. Pry bars over 18 inches long and hammers weighing over 2 lbs are not permitted for dismantling work.

3.2 EXAMINATION

A. Preparation for Removal and Dismantling: Examine construction to be removed or dismantled to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed or dismantled and location of utilities and services to remain that may be hidden by construction that is to be removed or dismantled.

1. Verify that affected utilities have been disconnected and capped.
2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage.
3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

B. Perform surveys as the Work progresses to detect hazards resulting from historic treatment procedures.

3.3 PROTECTION, GENERAL

A. Comply with temporary barrier requirements in Division 01 Section "Temporary Facilities and Controls."

B. Ensure that supervisory personnel are on-site and on duty when historic treatment work begins and during its progress.

C. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from historic treatment procedures.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Provide barricades, barriers, and temporary directional signage to exclude public from areas where historic treatment work is being performed.
3. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of historic treatment work.
4. Contain dust and debris generated by removal and dismantling work and prevent it from reaching the public or adjacent surfaces.
5. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
6. Protect floors and other surfaces along haul routes from damage, wear, and staining.

D. Temporary Protection of Historic Materials:

1. Protect existing historic materials with temporary protections and construction. Do not deface or remove existing materials.
2. Do not attach temporary protection to historic surfaces except as indicated as part of the historic treatment program and approved by Architect or Consultant.

E. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

F. Utility and Communications Services:

1. Notify Owner, Consultant, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by the historic treatment work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for the historic treatment work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

3.4 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners, toxins and removers.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in historic treatment program. Use covering materials and masking agents that are waterproof, UV resistant, and will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials to prevent stainig.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize and collect alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.5 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following.

1. Comply with NFPA 241 requirements unless otherwise indicated.
2. Remove and keep area free of combustibles including, rubbish, paper, waste, and chemicals, except to the degree necessary for the immediate work.

    a. If combustible material cannot be removed, provide fire blankets to cover such materials.

3. Prohibit smoking by all persons within Project work and staging areas which includes entire "barnyard" area and the immediate site of the barn or no closer than 100 feet from the barn whichever is greater. Smoking on the Claggett Campus is subject to their normal designated exterior areas. No cigarette products or waste from the tobacco or mechanical smoking devices shall be left on the grounds.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or highly combustible materials, including welding, torch-cutting, soldering, brazing, paint removal with heat, or other operations where open flames or implements utilizing high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of welding or other high-heat equipment. Notify Owner before each occurrence, indicating location of such work.
2. As far as practical, restrict heat-generating equipment to outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.

C. Fire Extinguishers, Fire Blankets, and Rag Buckets: Maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire watchers are trained in fire-extinguisher and blanket operation.

3.6 GENERAL HISTORIC TREATMENT

A. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.

B. Halt the process of deterioration and stabilize conditions, unless otherwise indicated. Perform work as indicated on Drawings. Follow the procedures in subparagraphs below and procedures approved in historic treatment program:

1. Retain as much existing material as possible; repair and consolidate rather than replace.
2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
3. Use reversible processes wherever possible.
4. Use historically accurate repair and replacement materials and techniques unless otherwise indicated.
5. Record existing work before each procedure (preconstruction) and progress during the work with digital preconstruction documentation. Comply with requirements in Division 01 Section "Photographic Documentation."

C. Notify Architect and/or Consultant of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing, pests; or due to structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect and/or Consultant.

D. Where Work requires existing features to be removed or dismantled and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.

E. Identify new and replacement materials and features with permanent marks hidden in the completed work to distinguish them from original materials. Record a legend of identification marks and the locations of the items on record Drawings.

3.7 HISTORIC REMOVAL AND DISMANTLING

A. General: Have removal and dismantling work performed by a qualified historic treatment specialist.

B. Perform work according to the historic treatment program.

C. Water-Mist Sprinkling: Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment that ensure that such water will not create a hazard or adversely affect other building areas or materials.

D. Anchorages:

1. Remove anchorages associated with removed items.
2. Dismantle anchorages associated with dismantled items.
3. In non-historic surfaces, patch holes created by anchorage removal or dismantling according to the requirements for new work.

4. In historic surfaces, patch or repair holes created by anchorage removal or dismantling according to Section specific to the historic surface being patched.

3.8 LEAD PAINT

A. Follow procedures required by authorities having jurisdiction and procedures as outlined in EPA pamphlet "Renovate Right".

END OF SECTION 013591

SECTION 02200 - Earthwork

PART 1 – GENERAL

1.01 SUMMARY

A. Perform excavation, filling, compacting and grading operations both inside and outside building limits as required for below-grade improvements and to achieve contours and elevations indicated. Provide trenching and backfill for mechanical and electrical work and utilities.
B. Provide subbase materials, drainage fill, and common fill materials for slabs, pavements, and improvements.
C. Provide suitable fill from offsite if on-site quantities are insufficient or unacceptable, and legally dispose of excess fill offsite.
D. Provide rock excavation without blasting unless blasting is specifically authorized.

1.02 SUBMITTALS

A. Submit for approval test reports, list of materials and gradations proposed for use.

1.03 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Subbase material: Gravel or crushed stone graded for intended use as subbase for paving materials specified.

B. Drainage fill: Unless otherwise indicated on structural drawings washed gravel or crushed stone, 1/4" to 3/4" size; ASTM C33, Size 67.

C. Common fill: Unless otherwise indicated on structural drawings mineral soil substantially free from organic and unsuitable materials, and free from rock or gravel larger than 2" in diameter; 80 percent passing No. 40 sieve and not more than 50 percent passing No. 200 sieve.

D. Structural fill: Unless otherwise indicated on structural drawings gravel or sandy gravel free of organic and unsuitable materials and within the following gradation limits: 4" sieve, 100 percent finer by weight; 1" sieve, 60 to 100 percent; No. 4 sieve, 25 to 85 percent; No.20 sieve, 10 to 60 percent; No. 50 sieve, 4 to 35 percent; No. 200 sieve, 0 to 5 percent.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Excavation is unclassified and includes excavation to subgrade regardless of materials encountered. Repair excavations beyond elevations and dimensions indicated as follows:

1. At structure: Concrete or compacted structural fill.
2. Elsewhere: Backfill and compact as directed.

B. Do not perform work without written authorization from the Owner if subgrade material is

unsuitable for intended use.

C. Maintain stability of excavations; coordinate shoring and bracing as required by authorities having jurisdiction. Prevent surface and subsurface water from accumulating in excavations. Stockpile satisfactory materials for reuse, allow for proper drainage and do not stockpile materials within drip line of trees to remain.

D. Compact materials at the optimum moisture content as determined by ASTM D698 by aeration or wetting to the following percentages of maximum dry density:

1. Structure, Pavement, Walkways: Subgrade and each fill layer to100% of maximum dry density to suitable depth.
2. Unpaved Areas: Top 6" of subgrade and each fill layer to 95% maximum dry density.

E. Place acceptable materials in layers not more than 12" loose depth for materials compacted by heavy equipment and not more than 6" loose depth for materials compacted by hand equipment to subgrades indicated as follows:

1. Structural Fill: Use under foundations, slabs on grade in layers as indicated.
2. Drainage Fill: Use under designated building slabs, at foundation drainage and elsewhere as indicated.
3. Common Fill: Use under unpaved areas.
4. Subbase Material: Use under pavement, walks, steps, piping and conduit.

F. Grade to within 1/2" above or below required subgrade and within a tolerance of 1/2" in ten feet.

G. Protect newly graded areas from traffic and erosion. Recompact and regrade settled, disturbed and damaged areas as necessary to restore quality, appearance, and condition of work.

H. Control erosion and windblown dust. Dispose of waste and unsuitable materials off site in a legal manner.

I. All structural fill shall be placed under the observation of an approved 3rd party testing agency. Each lift shall be tested for compaction as required herein.

END OF SECTION

SECTION 024119 - SELECTIVE DEMOLITION

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. Demolition and removal of existing concrete sills at top of ramp and Doors 101,102.
2. Removal of existing gutters and downspouts
3. Removal of existing rolling wood doors and subsequent salvage of wood members
4. Removal of upper layers of existing wood floor in center two bays of wagon level leaving lowest two levels in place.
5. Removal of existing lights and associated wiring/controls

B. Related Requirements:

1. Division 01 Section "Historic Treatment Procedures" for historic removal and dismantling.

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: Carefully detach from existing construction, in a manner to prevent damage and store as directed by Owner on site.

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

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

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PRE-DEMOLITION MEETING

A. Pre-demolition Conference: Conduct conference at Project Site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.

B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for dust control. Indicate proposed locations and construction of barriers.

C. Inventory: Submit a list of items to be removed, salvaged and delivered to Owner prior to start of demolition.

D. Pre-demolition Photographs or Video: Submit before Work begins.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

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

1. Before selective demolition, Owner will remove the following items:

a. Furniture.

b. No other disruptions to Owner activities are anticipated.

C. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: See section on Lead Paint in Painting Specification.

E. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 6 inches or more.

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

G. Utility Service: Maintain existing utilities indicated to remain in service (if any) and protect them against damage during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. 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 Engineer.

C. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

1. Comply with requirements specified in Division 01 Section "Photographic Documentation."
2. Inventory and record the condition of items to be removed and salvaged. Provide digital photographs of conditions that might be misconstrued as damage caused by salvage operations.
3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: All existing services/systems are to remain. Protect all services and systems against damage.

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.

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.

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 noted on the drawings. 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. 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. No cutting torches or open flame butane torches are to be used on the Project Site or any portion of the buildings for any reason.
5. Dispose of demolished items and materials promptly.

B. Work in Historic Areas: In historic spaces, areas, and rooms or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Division 01 Section "Historic Treatment Procedures."

C. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Engineer's approval.

1. Building Structure and Shell: 100 percent.

D. Removed and Reinstalled Items:

1. Clean and repair brick, stone, door and window components to functional condition adequate for intended reuse.
2. 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 Engineer, items may be removed to a suitable, protected storage location during selective demolition, and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Masonry: Demolish brick work in small sections. Use sawsall blades to cut joints around each brick or stone to be removed and salvaged for reuse.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.

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.

B. Burning: Do not burn demolished materials. No burning on the property will be permitted.

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.

3.8 SELECTIVE DEMOLITION SCHEDULE

A. Existing Items to Be Salvaged:

1. WOOD SHINGLES UNDER THE EXISTING METAL ROOFING ARE TO BE PRESERVED INTACT WITHOUT DAMAGE OF ANY KIND. No wood shingles or any portion of the wood roofing shall be removed or disturbed in anyway.

END OF SECTION 024119

SECTION 02712 - Foundation Drainage Systems

Part 1 - General

1.01 Description

A. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Building perimeter drainage system.

2. Filter aggregate, fabric and bedding.

1.02 RELATED SECTIONS

A. Section 03300 - Concrete

1.4 REFERENCES

A. ASTM D2729 - Poly (VinylChloride) (PVC) Sewer Pipe and Fittings.

1.5 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Shop Drawings: Indicate dimensions, layout of piping, high and low points of pipe inverts, gradient of slope between corners and intersections.

C. Product Data: Provide data on pipe drainage products, pipe accessories, and cover requirements.

1.7 SUBMITTALS AT PROJECT CLOSEOUT

A. Operation and Maintenance Data, Warranties.

B. Record as-built location of pipe runs, connections, cleanouts and principal invert elevations.

1.8 REGULATORY REQUIREMENTS

A. Conform to applicable code for materials and installation of the work of this section.

PART 2-PRODUCTS

2.1 PIPE MATERIALS

A. Manufacturers:
1. Contech.
2. Hancor.
3. An approved equal

B. Polyvinyl Chloride Pipe: ASTM D2729; plain end, 4 inch inside diameter; with required fittings.

C. Use perforated pipe at subdrainage system; unperforated through sleeved walls.

2.2 AGGREGATE AND BEDDING

A. Filter Aggregate and Bedding Materials: Fill Type AASHTO A-1 as specified in Section 02200.

2.3 ACCESSORIES

A. Pipe Coupling: Solid plastic.

B. Filter Fabric: Water pervious type, black polyester manufactured by Trevira or approved equal.

PART 3-EXECUTION

3.1 EXAMINATION

A. Verify that excavated base is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with Type A1 aggregate.

B. Remove large stones or other hard matter which could damage drainage piping or impede consistent backfilling or compaction.

3.3 INSTALLATION

A. Install and join pipe and pipe fittings in accordance with pipe manufacturer's instructions.

B. Place drainage pipe on clean bedding material.

C. Lay pipe to slope gradients noted on Drawings; with maximum variation from true slope of 1/8 inch in 1 foot.

D. Bed pipe with perforations facing down. Mechanically join pipe ends.

E. Install pipe couplings.

F. Install aggregate at sides, over joint and top of pipe. Provide top cover compacted thickness of 12 inches.

G. Place filter fabric over levelled top surface of aggregate cover prior to subsequent backfilling operations.

H. Place aggregate in maximum 8 inch lifts, consolidating each lift as specified in Section 02200.

I. Do not displace or damage pipe when compacting.

J. Place impervious fill over drainage pipe aggregate cover and compact.

K. Connect to stone media system with perforated pipe as directed by plans.

L. Extend drainage pipe eastward away from building to daylight.

3.4 FIELD QUALITY CONTROL

A. Section 01400 - Quality Assurance: Field inspection and testing.

B. Request inspection prior to and immediately after placing aggregate cover over pipe.

3.5 PROTECTION

A. Protect finished installation under provisions of the General Conditions.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

END OF SECTION 02712

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cast-in-place concrete foundation walls and supported slabs.
B. Floors and slabs on grade.
C. Beneath slab vapor barriers for general slabs and slabs with athletic wood floors.
D. Control, expansion, and contraction joint devices associated with concrete work.
E. Equipment pads, light pole base, flagpole base, thrust blocks, and miscellaneous items.

1.02 RELATED REQUIREMENTS

A. Section 027120 - Foundation Drainage System.
B. Section 033460 Concrete Floor Slab Preparation
C. Section 035500 Decorative Concrete Slab Finishes
D. Section 051200 - Structural Steel.
E. Section 079000 - Sealants.

1.03 REFERENCE STANDARDS

A. ACI 301 - Structural Concrete for Buildings.
B. ACI 302 - Guide for Concrete Floor and Slab Construction.
C. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
D. ACI 305R - Hot Weather Concreting.
E. ACI 306R - Cold Weather Concreting.
F. ACI 308 - Standard Practice for Curing Concrete.
G. ACI 318 Building Code Requirements for Reinforced Concrete.
H. ANSI/ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type).
I. ANSI/ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type.
J. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
K. ANSI/ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
L. ASTM B221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.
M. ASTM C33 - Concrete Aggregates.
N. ASTM C94 - Ready-Mixed Concrete.
O. ASTM C150 - Portland Cement.
P. ASTM C260 - Air Entraining Admixtures for Concrete.
Q. ASTM C330 - Light Weight Aggregates For Structural Concrete.
R. ASTM C494 - Chemicals Admixtures for Concrete.
S. ASTM C618 - Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 3300.
B. Product Data: Provide data on joint devices, attachment accessories, admixtures and curing compounds.

C. Submit mix designs (by a qualified testing laboratory) for pea gravel and normal concrete. Submit procedures to be followed for hot weather and cold weather construction. Submittals must be made prior to any installations.

D. Products Furnished but Not Installed Under This Section:

1. Section 03 1000 - Concrete Formwork: Placement of joint device and joint device anchors in formwork.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7000.

B. Accurately record actual locations of embedded utilities and components which are concealed from view.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

B. Acquire cement and aggregate from same source for all work.

C. Conform to ACI 305R when concreting during hot weather.

D. Conform to ACI 306R when concreting during cold weather.

1.07 COORDINATION

A. Coordinate work under provisions of Section 01 3000.

B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type; manufactured by St. Lawrence Cement or Lehigh Cement Co.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: Clean and not detrimental to concrete.

2.02 ADMIXTURES

A. Air Entrainment: ASTM C260; Daravair 1,000 or equal manufactured by W. R. Grace.

B. Chemical: ASTM C494, Type A - Water Reducing, Type D - Water Reducing and Retarding, Type E - Water Reducing and Accelerating, admixture; such as Dozough manufactured by Master Builders.

2.03 ACCESSORIES

A. Bonding Agent: Two component modified epoxy resin.

B. Vapor Barrier: 15 mil thick polyethylene film; tape all seams.

C. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

2.04 JOINT DEVICES AND FILLER MATERIALS

A. Joint Filler Type A: Flexible foam expansion joint filler complying with ASTM D1752, Sections 5.1 through 5.4; 2 inch thick, equal to Ceramar by W. R. Meadows with water absorption of 0.246% of volume as tested in accordance with ASTM D545.

B. Construction Joint Devices: Integral; 1/8 inch thick, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

C. Sealant and Primer: Type, as specified in Section 07 9000.

2.05 CONCRETE MIX

A. Mix and deliver concrete in accordance with ASTM C94, Alternative No. 2.

B. Select proportions for normal weight concrete in accordance with ACI 301 Method 2.

C. Provide concrete to the following criteria (or as noted on the drawings):

1. Design Mix	7 Day Strength	28 Day Strength
3,000 psi	1,950 psi	3,000 psi
4,000 psi	2,600 psi	4,000 psi

2. Slump: per ASTM C-94.

D. Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.

E. Use of calcium chloride shall be prohibited.

F. Use set retarding admixtures during hot weather only when approved by Architect/Engineer.

G. Add air entraining agent to normal weight concrete mix for work exposed to exterior at 5-7 percent air content.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of Section 01 3000.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.02 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304, ACI 301, ACI 318.

B. Notify Architect/Engineer minimum 24 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, formed joint fillers and joint devices are not disturbed during concrete placement.

D. Install vapor barrier under interior slabs on grade. Lap joints minimum 6 inches and seal watertight by sealant applied between overlapping edges and ends or taping edges and ends.

E. Repair vapor barrier damaged during placement of concrete reinforcing. Repair with vapor barrier material; lap over damaged areas minimum 6 inches and seal watertight.

F. High Performance Vapor Barriers used in conjunction with Athletic Wood Floor Vapor Beneath Slab Vapor Barriers shall be installed in accordance with the manufacturer=s written instructions with self-adhered taped laps.

G. Install joint fillers, primer and sealant in accordance with manufacturer's instructions.

H. Separate slabs on grade from vertical surfaces with 2 inch thick joint filler.

I. Extend joint filler from bottom of slab to within 2 inch of finished slab surface. Conform to Section 07900 for finish joint sealer requirements.

J. Install joint devices in accordance with manufacturer's instructions.

K. Install construction joint device in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

L. Install joint device anchors. Maintain correct position to allow joint cover flush with floor and wall finish.

M. Install joint covers in longest practical length, when adjacent construction activity is complete.

N. Apply sealants in joint devices in accordance with Section 07 9000.

O. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

P. Place concrete continuously between predetermined expansion, control, and construction joints.

Q. Do not interrupt successive placement; do not permit cold joints to occur.

R. Place floor slabs as indicated on structural drawings or submit actual plan of concrete slab placement.

S. Saw cut joints within 24 hours after placing. Using 3/16 inch thick blade, cut into 1/4 depth of slab thickness.

T. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

U. Consolidation of concrete shall be done in accordance with ACI 301.

3.04 CONCRETE FINISHING

A. Provide formed concrete surfaces to be left exposed concrete walls, columns, and beams with smooth rubbed finish.

B. Finish concrete floor surfaces in accordance with ACI 301.

C. Wood float surfaces which will receive quarry tile, ceramic tile with full bed setting system.

D. Steel trowel surfaces which will receive carpeting, resilient flooring, seamless flooring, thin set quarry tile, thin set ceramic tile.

E. Steel trowel surfaces which are scheduled to be exposed.

F. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/8 inch per foot.

G. Apply cure and seal in accordance with Section 03 3700 - Concrete Curing.

3.05 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed in accordance with ACI 301 and under provisions of Section 01 4000.

B. Provide free access to Work and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.

D. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

E. Three concrete test cylinders will be taken for every 50 or less cu yds of each class of concrete placed. Cylinders shall be tested on 7 day and 28 day intervals. The third cylinder shall be tested if a failure should occur and be utilized as a comparison.

F. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. One slump test and one air content test will be taken for each truck load in accordance with ASTM and ACI Standards.

3.06 PATCHING

A. If excessive honeycomb or embedded debris is present in concrete when forms are removed, this will not acceptable. Notify Architect/Engineer upon discovery.

B. Patch imperfections in accordance with ACI 301.

3.07 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Architect/Engineer.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

3.08 SCHEDULE – CONCRETE TYPES AND FINISHES

A. Foundation Walls and Footings: 3,000 psi 28 day concrete, form finish with honeycomb filled surface.

B. Slabs on Grade and Elevated Slabs: 4000 psi 28 day concrete, finish per Article 3.04.

END OF SECTION

SECTION 033460 - CONCRETE FLOOR SLAB PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finishing slabs on grade and elevated slabs.

B. Surface treatment with concrete hardener and sealer.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Prepared concrete slabs and toppings ready to receive finish.

B. Section 03 3000 - Cast-in-Place Concrete: Control and formed expansion and contraction joints and joint devices.

C. Section 035500 Decorative Concrete Slab Finishes

1.03 REFERENCE STANDARDS

A. ACI 301 - Structural Concrete for Buildings.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 3300.

B. Product Data: Provide data on finishing compounds, product characteristics, compatibility and limitations.

C. Manufacturer's Installation Instructions: Indicate criteria for preparation and application for both new and existing slabs.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products under provisions of Section 01 6000.

B. Deliver materials in manufacturer's packaging including application instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS (for non decorative slabs)

A. Sonneborn.

B. Master Builders.

C. Thoroseal.

D. Substitutions: Under provisions of Section 01 6000.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of Section 01 3000.

B. Verify that floor surfaces are acceptable to receive the Work of this Section.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301.

B. Wood float surfaces which will receive quarry tile, ceramic tile, with full bed setting system.

C. Steel trowel surfaces which will receive carpeting, resilient flooring, seamless flooring thin set quarry tile thin set ceramic tile.

D. Steel trowel surfaces which are scheduled to be exposed.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/8 inch per foot nominal or as indicated on Drawings.

3.03 FLOOR SURFACE TREATMENT

A. Apply liquid sealer in accordance with manufacturer's instructions on scheduled floor surfaces.

B. Finish to a polished sheen.

3.04 TOLERANCES

A. Maximum Variation of Surface Flatness For Exposed Concrete Floors: 1/8 inch in 10 ft.

B. Maximum Variation of Surface Flatness Under Seamless Resilient Flooring: 1/8 inch in 10 ft.

C. Maximum Variation of Surface Flatness Under Carpeting: 1/8 inch in 10 ft.

3.05 SCHEDULES

A. All exposed new concrete: Float Finish.

END OF SECTION

SECTION 035500 - Concrete Floor Finishes

Part 1 - GENERAL

1.01 DESCRIPTION

A. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Application of hardener/densifier to protect and polish horizontal concrete surfaces.
2. Application of stain to protect and polish horizontal concrete surfaces.

1.02 RELATED WORK SPECIFIED ELSEWHERE

1. Cast In Place Concrete: SEE Structural Notes on Drawings
2. Painting: Section 09900

1.03 REFERENCES

A. ASTM E 430 — Standard Test Methods for Measurement of Gloss Of High Gloss Surfaces of Abridged Coniophotometry.

B. ASTM E 1155 — Standard Test Method to Determine Floor Flatness and Levelness Using the F-Number System.

C. ASTM E1486 - Waviness Index

D. ASTM C1028 — Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.

E. ACI 302.1R-89 — Guide for Concrete Floor and Slab Construction.

F. ASTM D3363-05 - Standard Test Method for Film Hardness by Pencil Test

G. RILEM Test Method 11.4 - Measurement of Water Absorption Under Low Pressure.

H. ACI Committee 201 - "Guide for Making a Condition Survey of Concrete in Service" (Site Survey)

1.04 SUBMITTALS

A. VOC Certification: Submit certification that products furnished comply with regulations controlling use of volatile organic compounds (VOC).

B. Product Data: Submit manufacturer's product datasheets on all Products to be used for the work. Submit description for protection of surrounding areas and non-masonry surfaces, surface preparation, application, and final cleaning.

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors.

D. Verifications Samples: For each finish product specified, two samples, minimum size 2 inches (51 mm) square, representing actual product, color and finish.

E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

F. Manufacturer's acknowledgment of applicator qualifications.

G. VOC Certification: Submit certification that products furnished comply with regulations controlling use of volatile organic compounds (VOC).

1.05 PERFORMANCE CRITERIA

A. High tolerance hardener densifier for concrete floor finish shall comply with the following performance requirements.

B. Floor Condition

1. ASTM E 1155 — Standard Test Method to Determine Floor Flatness and Levelness Using the F-Number System.
2. ASTM E1486 - Waviness Index
3. ACI 20.1 - "Guide for Making a Condition Survey of Concrete in Service"
   a. Cracks
   b. Scaling
   c. Scratches
   d. Dusting
   e. Contaminants present on surface.

C. Finished Floor Performance Criteria

1. ASTM C 1028 - ADA Coefficient of Friction:
   a. COF ≥ 0.60 for accessible routes and ≥0.80 for ramps
2. ASTM E 430 - . Degree of Reflectiveness
3. ASTM D3363-05, Standard Test Method for Film Hardness by Pencil Test
4. RILEM Test Method, No. 11.4, Measurement of Water Absorption Under Pressure
   a. Level of Resistance: Hold at 5 ml for 20 minutes

1.06 QUALITY ASSURANCE

A. Applicator Qualifications:

1. Company specializing in performing work of this section, trained and certified by the high performance horizontal concrete surface treatment manufacturer.
2. Employs persons trained for the application of the specified products.
3. Submit letter from manufacturer indicating applicator has proper education on products for this type of application.

D. Test panel: Provide a test panel for evaluation of concrete surface acceptability for application, surface preparation, control and expansion joints filling, high tolerance floor finish application workmanship, color, gloss, slip resistance and water resistance.

1. Utilize "Condition Survey" as review guideline for condition of concrete surface.
2. Conduct Surface Preparation actions as necessary.
3. Install system complete with color and finish to establish standards for approval and evaluation of reminder of concrete surface.
4. Apply specified products in accordance with manufacturer's written instructions.
5. Test panel shall be a minimum of 10% of total concrete surface to receive application.
6. Location is to be area agreed upon by owner and Owner's Representative. Area recommended should be in low traffic area.
7. Follow 3.04 Field Quality Control to confirm performance criteria.
8. Do not proceed with remaining work until test panel approval in writing by Owner's Representative has been executed.
9. Record results of Field Quality Control Testing to establish performance criteria for evaluation of completed work. Retain for owner and/or warranty submittal.
10. Unacceptable results for owner will require applicator to correct for approval.
11. Approved test panel is to become a part of the completed work.

1.07 ENVIRONMENTAL REGULATIONS

A. Comply with applicable federal, state and local environmental regulations.
B. Submit plan for disposal of waste from polishing process.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
B. Storage and Handling: Store containers upright in a cool, dry, well ventilated place, out of the sun with temperature between 40° and 100° F (4° and 38° C). Protect from freezing. Store away from all other chemicals and potential sources of contamination. Keep lights, fire, sparks and heat away from containers. Do not drop containers or slide across sharp objects. Do not stack pallets more than three high. Keep containers tightly closed when not in use. Store and handle materials in accordance with manufacturer's written instructions.
C. Store and dispose of materials in accordance with requirements of Local Authorities Having Jurisdiction.

1.09 PROJECT CONDITIONS

A. Temperature Limitations:

1. Do not apply when surface and air temperature are below 40° F or above 95° F unless otherwise indicated by manufacturer's written instructions.
2. Do not apply when surface and air temperatures are not expected to remain above 40° F for a minimum of 8 hours after application, unless otherwise indicated by manufacturer's written instructions.

B. Do not apply under windy conditions such that the concrete surface treatment may be blown to surfaces not intended.
C. Do not apply to frozen substrate. Allow adequate time for substrate to thaw, if freezing conditions exist before application.
D. Do not apply earlier than 24 hours after rain or if rain is predicted for a period of 8 hours after application, unless otherwise indicated by manufacturer's written instructions.
E. Temporary Lighting: Minimum 200 W light source, placed 8 feet (2.5 m) above horizontal concrete surface, for each 425 SF (40 sq m) of concrete being finished.
F. Temporary Heat: Ambient temperature of 50° F (10° C) minimum.
G. Ventilation: Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with manufacturer's Instructions.

1.10 COORDINATION

A. Coordinate the work with concrete placement, initial finishing and concrete curing.

PART 2 -PRODUCTS

2.01 MANUFACTURER

A. PROSOCO, Inc., 3741 Greenway Circle Lawrence, KS 66046, 800-255-4255, 785-865-4200, Fax 800-877-2770.
B. Substitutions: Must be submitted for approval and approved in advance of submitting bids.

2.03 HARDENER DENSIFIERS

A. Consolideck® LS
1. Premium hardener, densifier and sealer for concrete surfaces. This patented formulation is a penetrating lithium silicate treatment that reacts with the concrete to produce soluble calcium silicate hydrate within the concrete pores. Treated surfaces resist damage from water and surface abrasion. The increased surface hardness imparted by LS reduces dusting and simplifies maintenance producing a cleaner, healthier environment.
a. Form: Clear, water-like liquid

b. Specific Gravity: 1.10
c. pH: 11.0
d. Wt/Gal: 9.2 lbs.
e. Active Content: 14.5%
f. Total Solids: 14.5%

g. Flash Point: NA

h. Freeze Point: 32°F (0°C)

i. Shelf Life: 2 years in unopened, factory sealed container
j. VOC Content < 20 g/L Complies with all known national, state and district AIM VOC regulations.

2.04 SURFACE PROTECTION

A. Consolideck® LSGuard
1. A high-gloss penetrating premium sealer, lithium silicate hardener and densifier for horizontal concrete surfaces including cement terrazzo. Treated surfaces resist damage from water, chemical attack and abrasion.
a. Form: Milky white liquid
b. Specific Gravity: 1.11
c. Active Content: 22 percent
d. Total Solids: 22 percent
d. p/H: 11.0
e. Wt/Gal: 9.2 lbs.
f. Freeze Point: 32 degrees F (0 degrees C)
g. VOC Content: Less 100 g/L California CHPS: Tested and conforms to Section 01350 (Special Environmental Requirements) LEED® for Schools: Tested and qualifies for EQ Credit 4: Low Emitting Materials (Option2)

2.06 PROTECTIVE CLEANERS

A. Consolideck® LSPolishGuard
1. A concentrated maintenance cleaner for concrete floors. The lithium Silicate component helps maintain concrete hardness by curing any "soft" calcium hydroxide left over from the original hardening/densifying treatment.
a. Form: Clear liquid, soapy odor
b. Specific Gravity: 1.00
c. pH: 9.87
d. Wt/Gal: 8.38 lbs.
e. Flash Point: ASTM D 3278, more than 200 degrees F (more than 93º C)
f. VOC Content: Maximum 4 percent

PART 3 -EXECUTION

3.01 EXAMINATION

A. Obtain and follow manufacturer's instructions for examination and testing of substrates.
B. Verify by examination utilizing Condition Survey that concrete surfaces are acceptable to receive the specified products. Notify the Owner's Representative if surfaces are not acceptable to receive the specified products.

3.02 PREPARATION OF SURFACE PRIOR TO APPLICATION

A. Clean all dirt, dust, oil, grease and other contaminants from surfaces that interfere with penetration or performance of specified product. Use appropriate concrete cleaners listed under Part 2 PRODUCTS or approved by the concrete surface treatment manufacturer prior to use. Rinse thoroughly using pressure water spray to remove cleaner residues. Allow surfaces to dry completely before application of product.
B. Repair, patch and fill all cracks, voids, defects and damaged areas in surface as approved by the Owner's Representative. Allow repair materials to cure completely before application of product.
C. Variations in substrate texture and color will affect final appearance.
D. Expansion joints are to be left unsealed until application is complete. See Section 07900 for details.
    1. Protect adjacent surfaces around joint.
    2. Insure all excess material is removed from surface.
E. Seal all open control joints prior to grinding application.
    1. Protect adjacent surfaces around joint.
    2. Insure all excess material is removed from surface before polishing.
F. Once the concrete is clean and dry, proceed with
    1. Provide grinding application (for stain 1 and 2 only) to acheive a 200 grit smoothness.

3.03 SURFACE PREPARATION

A. Utilize appropriate cleaners referenced in Part 2 Products, 2.02 Surface Preparation and 2.07 Protective Cleaners to remove all contaminants from the surface. Follow manufacturers printed Product Data Sheets for directions. If products are used in the surface preparation that are not referenced above consult densifier manufacturer for approval.

3.04 APPLICATION — DENSIFIER HARDENER

A. Apply products to surface in accordance with manufacturer's written instructions, environmental regulations, and application procedures determined from test panel results approved by the Owner's Representative. For current Product Data Sheets consult www.consolideck.com.
B. Apply to clean, dry, cured and properly prepared surfaces approved by the Owner's Representative.
C. Consult manufacturer's written instructions for information on application equipment to be used and precautions to be taken with the specified products.
D. Apply at a coverage rate established on the Test Panel, approximately 400-500 square feet per gallon. Apply by HVLP, High Volume Low Pressure spray.
E. Allow applied material to dwell on the surface for approximately 10-15 minutes. If material does not dwell for the dwell time period reapply additional material. If excess is on the surface squeegee or broom to another area for absorption.
F. Excess material should be moved to areas by broom.
G. Do not dilute or alter products. Apply as packaged.
H. Do not apply to painted surfaces.

3.05 APPLICATION OF PROTECTIVE TREATMENT

A. Surface must be clean and free of dirt. Use Consolideck LS Polish Guard to clean floor before applying the Protective Treatment
B. Apply products to surface in accordance with manufacturer's written instructions, environmental regulations, and application procedures determined from test panel results approved by the Owner's Representative. For current Product Data Sheets consult www.consolideck.com.
C. Apply at a coverage rate established on the Test Panel, approximately 1,200-1,500 square feet per gallon. Apply by HVLP, High Volume Low Pressure spray and level with applicator to provide a thin film.
D. Allow material to dry and then burnish with a 3,000 rpm propane burnisher till material has set.

3.06 FIELD QUALITY CONTROL

A. Inspection: Inspect the application of the products with the Contractor, Owner's Representative, applicator and PROSOCO representative, and compare with test panel results approved by the Owner's Representative determine if the substrates are suitably protected by the specified product.
B. Manufacturer's Field Services: Provide the services of a manufacturer's authorized field representative to verify specified products are used and protection, surface preparation and application of specified products are in accordance with the manufacturer's written instructions and the test panel results approved by the Owner's Representative.

3.07 TOLERANCES

A. Floor Flatness: Measure for FF and FL tolerances for floors in accordance with ASTM E 1155, within 48 hours after slab installation. Finish concrete to achieve the following tolerances:
   1. Flatness: FF 40
   2. Levelness: FL 30

B. Waviness Index: ASTM E1486 Waviness Index Frequency:

C. Correct slab surface when actual F or L number for floor installation measures less than required.

3.08 FINAL CLEANING

A. Clean site of all unused product, residues, rinse water, wastes, and effluents in accordance with environmental regulations.

B. Remove and dispose of all materials used to protect surrounding areas and non-masonry surfaces, following completion of the work of this section.

C. Repair, restore or replace to the satisfaction of the Owner's Representative, all materials, landscaping and non masonry surfaces damaged by exposure to the work of this section.

3.09 PROTECTION

A. Protect applied products until completion of project using Ram Board floor protection. Tape all joints with 2" wide duct tape. info@ramboard.com.

B. Protect surrounding areas prior to application. If accidentally misapplied to adjacent surfaces, flush with water immediately before material dries.

C. Avoid contact in areas not to be treated. Avoid contact with metal, glass and painted surfaces.

D. Do not permit traffic over unprotected floor surfaces.

E. Touch-up repair or replace damaged products before Substantial Completion.

3.10 SCHEDULE

A. Finish Schedule

1. Stain: Apply GemTone Stain and LS sealer, hardener & densifier, and Polish Guard (two different colors will be selected)

END OF SECTION 03550

SECTION 040120 – HISTORIC STONE AND BRICK MASONRY

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 RELATED SECTIONS

1. Division 01 Section "Historic Treatment Procedures."
2. Division 01 Section "Unit Prices."
3. Division 04 Section "Maintenance of Stone Assemblies."

1.3 SUMMARY

A. Section includes restoration and cleaning of stone and brick masonry as follows:

1. Repair/restore stone and brick masonry, including replacing missing stone in all foundation walls and brick units in archway through D103 cold cellar door.
2. Repointing exterior stone mortar joints on a per unit basis.
3. Repointing interior stone mortar joints in stable level foundation walls.
4. Rebuild arched wall and header bricks over D103 cold cellar opening. (Drawing A5.1 and A6.2)
5. Provide fully mudded masonry seats for existing summer beams. (Drawing A6.2)
6. Rebuild using recovered stone on floor the fallen northeast corner return.
7. Tear down, clean stones and rebuild with square right angle corners the southeast stable wall corner return. (Drawing A6.2)
8. Retain existing sill stone at south end stable wall door opening. Match door sill stone for the other five stable wall door openings at same dimensions and level.
9. Clean deteriorated mortar from joints where mortar has eroded a minimum of 3/8". Repoint all cleaned joints to match remainder of Portland mortar joinery.
10. Restore all rotten and missing level boards capping stone foundation where joists rest on wall.
11. Rebuild the entrance wagon door ramp stone cheek walls

B. Owner-Furnished Material: If any historic stone units or bricks are on the grounds or stored in the buildings and if the stored stone and bricks match the historic wall units, the salvaged historic stone and brick stored on-site in or near building walls, may be used. Any bricks needed beyond those that may or may not be available shall be provided by Masonry Contractor.

1.4 HISTORIC BUILDING

A. Project work involves rehabilitation of a historically significant building. The building shall be treated respectfully. Existing conditions are to be carefully respected and no material, component or element shall be removed or disfigured unless specifically indicated on the Drawings, specified herein, or directed by the Architect or Consultant.

1.5 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Division 01 Section "Unit Prices."

1. Remove and replace spalled/damaged/missing stone wall and brick arch units as part of stone and brick removal and replacement unit pricing.
2. Repoint stone foundation walls as part of repointing masonry per unit pricing.
3. Repoint brick archway leading into cold storage cellar and barrel vault beyond.

B. Unit prices apply to additions to and deletions from Work as authorized by Change Orders approved by Consultant.

1.6 DEFINITIONS

A. Very Low-Pressure Spray: Under 100 psi not to exceed psi greater than allowed for garden hose pressure on site.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified lime mortar testing lab to perform preconstruction testing on existing pointing and bedding mortars as follows. Lab can be an in-house part of the lime manufacturing company.

1. Existing Mortar: Send 4 ounces of original mortar sample to lime mortar company providing specified lime and or Portland mortar for project. Have mortar company review for the type of mortar (lime or Portland), aggregate, limestone or burned lime contents and proportions. Have company recommend type of mortar to be used.
2. Color of existing and replacement mortar is to retain the wide variations of gray currently exhibited on the stone foundation walls. Replacement mortar color shall be as close to the variations of gray currently exhibited within walls.
3. No other testing required.

1.8 SUBMITTALS

A. Product Data: For each type of product indicated, include manufacturer's recommendations for application and use. Include test data substantiating that products comply with requirements.

B. Samples for Initial Selection: For the following:

1. Stone: Each type of masonry unit to be used for replacing existing missing or damaged units. Include 8 stone samples or as many as necessary to show the full range of size, shape, color, and texture to be expected.

2. Bricks: Each type of masonry unit to be used for replacing existing units. Include 8 brick samples or as many as necessary to show the full range of size, shape, color, and texture to be expected.

   a. Only unpainted or uncoated historic used bricks will be permitted. Only exterior grade historic bricks with no chips, cracks or large aggregate will be permitted. Provide a minimum of 4 to 8 bricks for initial review and approval.

3. Sand: Each type of sand proposed for use in pointing mortar; minimum one (1) pound of each in heavy mill zip lock plastic bags.

   a. For blended sands, provide Samples of each component and blend.
   b. Identify sources, both supplier and quarry, of each type of sand.

4. Pointing Mortar: Submit 3 mortar samples for pointing in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.

   a. Have each sample contain a close color range of different mixes of colored sands each mixed with specified lime and/or Portland that produce a mortar matching the cleaned exterior surfaces of the stone wall pointing when cured and dry.
   b. Submit each sample with precise measurements on ingredients, proportions, gradations, and sources of colored sands from which each sample was made.

5. Samples will be retained by Owner until full shipment of all materials has arrived on site. Samples will be checked against materials on site to make sure they match all aspects of the approved samples.

C. Qualification Data: For masonry restoration specialists who will actually perform the work. Refer to 1.9 Quality Assurance below.

D. Restoration Program. Write procedures for removing, cutting, patching and replacing historic brick and stone components. Program must be clearly and thoroughly written. Include protection procedures to be used to protect adjacent surfaces. Include all

manual (hand tools), electrical equipment and other procedures to be used. See below 1.8 Quality Assurance, D. for further instructions. No work will proceed until Restoration Program has been approved in writing by the Consultant.

E. Cleaning Program. Write procedures to be used for cleaning and preparing repaired, restored brick walls for staining and/or painting. Include brand names of products to be used, if any beyond potable water are to be used. See below 1.8 Quality Assurance, E. for further instructions. No work will proceed until Cleaning Program has been approved in writing by the Consultant.

1.9 QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced**,** preapproved masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work on buildings and materials similar in age, material (historic soft brick and mortar work), design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry is not sufficient experience for historic masonry restoration work. The firm must have a minimum 5 years of successful completion of this type of work. Individuals who are lead and journeyman level masons who will actually perform the work on this barn foundation must also have a minimum of 5 years of successful completion of this type of work. Vitaes/resumes must be submitted for the firm and each worker who will perform work on the brick or stone portions of the main house and smoke house.

1. At Contractor's option, work may be divided between two specialist firms: one for cleaning work and one for repair work.
2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisor (s) on Project site during times that stone and brick masonry restoration and cleaning work is in progress. Supervisor(s) shall not be changed during Project except for causes beyond the control of restoration specialist firm.
3. Should Supervisor need to be replaced during the masonry work, the proposed replacement Supervisor must first be preapproved as qualified to lead masonry work.
4. Restoration Worker Qualifications: Provide persons who are experienced and specialize in restoration work of types they will be performing per above written Restoration Specialist Qualifications.

B. Source Limitations: Obtain each type of material for masonry restoration (replacement stone, historic exterior grade face brick, lime, sand, etc.) from no more than two sources each with the resources to provide materials of consistent quality in appearance and physical properties.

C. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising

performance and preventing damage due to worker fatigue. No work will proceed until Quality-Control Program has been approved in writing by the Consultant.

D. Restoration Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work including protection of surrounding materials and Project site.

1. Include methods for keeping pointing mortar damp during curing period.
2. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

E. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used, protection of surrounding materials, and control of runoff during operations.

1. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

F. Mockups: Prepare mockups of restoration and cleaning to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.

1. Masonry Repair: Prepare one sample area mockup using approved stone and pointing mortar on the west interior bank wall of the barn where indicated by the Consultant.

2. Masonry Cleaning: Prepare one sample mockup area of interior masonry cleaning.
3. Size of mockup is not to be less than 3 feet square.
   a. Mockup is to have finished pointed mortar joints.
4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Consultant specifically approves such deviations in writing.
5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
6. Mockups that are not approved shall be removed without damaging any portions of the interior bank wall of the barn.
7. Mockups shall be constructed until the mockup meets the standards specified within the contract documents and visually matches the walls of the standing structures to be restored under this program of work.

G. Pre-installation Conference: Conduct conference at Project site.

1. Review methods and procedures related to masonry restoration and cleaning including, but not limited to, the following:

    a. Conference will be scheduled after submission of written Quality Control, Restoration and Cleaning Programs have been received, reviewed and approved in writing by Consultant.
    b. Construction schedule. Verify availability of materials, Restoration Specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
    c. Materials, material application, sequencing, and tolerances.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry units to Project site stacked on pallets or delivered in such a way as to avoid damage to delivered and stored historic stone and brick units.

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

C. Store lime and other bagged mortar materials on elevated platforms, under cover, and in a dry location. Do not use mortar materials that have become damp or lumpy.

D. Store Natural Hydraulic Lime or other approved lime ingredients in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened and exposed to atmospheric moisture causing lumpiness in lime.

E. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.11 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry restoration and cleaning work to be performed according to manufacturers' written instructions and specified requirements.

B. Repair masonry units and repoint mortar joints only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of the Work unless stone work and/or pointing is protected from sun and weather or as otherwise indicated.

C. Cold-Weather Requirements: Comply with the following procedures for masonry repair and mortar-joint pointing unless otherwise indicated:

1. Water for cleaning purposes of any kind may not be applied to exterior walls under any pressure starting October 1 and running through March 31 of the following year.

2. When air temperature is below 40 deg F, heat mortar ingredients, masonry repair materials, and existing masonry walls to be repaired/restored to produce temperatures between 40 and 120 deg F.
3. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 40 deg F within the enclosure during the entire time of the work and for 14 days after repair and pointing work is completed.

D. Hot-Weather Requirements: Protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.

E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

1.12 COORDINATION

A. Coordinate masonry restoration and cleaning with public circulation patterns at Project site. Some work is near public circulation patterns such as along the north gable where a road accesses buildings below the barn and the southwest corner where walkways allow pedestrians to walk near the barn. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work**.** Plan work with on-site staff and execute the Work accordingly.

1.13 SEQUENCING AND SCHEDULING

A. Order replacement stone and bricks after initial masonry units have been submitted for review and approved in writing by the Consultant and at earliest possible date to avoid delaying completion of the Work.

B. Order sand and specified lime for pointing mortar immediately after approval of Mockups. Take delivery of and store at Project site a sufficient quantity to complete Project.

C. Perform masonry restoration work in the following sequence:

1. Restore masonry doorway D103 including all stone and brick work.
2. Restore masonry doorways D102 and D102, exterior gable end doors.
3. After underpinning operations have been performed to stabilize two closed end foundation walls under forebay, rebuild the two corner returns to original dimensions with sharp corner and plumb construction.
4. Carefully remove stone foundation where D104 will be located. Salvage and clean all stone removed to create new D104 doorway. (Drawing A5.1)
5. Repair masonry, including replacing existing masonry with approved masonry materials.

6. Rake out mortar from deteriorated, damaged, spalled, powdery or weathered joints to be repointed.
7. Point mortar joints with approved mortar.
8. Clean out holes created from stone loss or removal of all remaining bed and pointing mortars.
9. Rake out mortar from joints surrounding masonry to be replaced and/or rebuilt and from deteriorated, damaged, spalled, powdery or weathered joints adjacent to masonry repairs.
10. Inspect remaining stone foundation for open mortar joints and repair before cleaning to prevent the intrusion into the walls and foundations of water and other cleaning materials, if used.
11. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
12. One final time inspect for open mortar joints and repair before cleaning to prevent the intrusion into the walls of water and other cleaning materials.
13. Build new, low stable stone wall per Drawing A5.1 and A5.3.
14. Clean masonry surfaces using non-ferrous brushes and a light pressure (40 to 50 psi) potable water wash.

PART 2 - PRODUCTS

2.1 MORTAR MATERIALS

A. Factory-Prepared Natural Hydraulic Lime

B. Mortar Sand: ASTM C 144 unless otherwise indicated.

1. Color: Provide natural sand of color necessary to produce required mortar color.
2. For pointing mortar, provide sand with rounded edges. (Commonly found in stream beds and river banks.)
3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.

C. Mortar Pigments: No mortar pigmentation will be permitted. Use only natural sand and aggregate ingredients to achieve color ranges desired.

D. Water: Potable.

2.2 Mortar Suppliers

A. LimeWorks.us
Andy DeGruchy
3145 State Road
Telford, PA 18969
use website for email
(215) 536-6706

2.3 CLEANING MATERIALS

A. Water: Potable.

B. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal of solution required.

C. Appropriate Chemical Cleaners such as Sure Clean are permitted for light cleaning upon completion of mortar brick and stone work.

2.4 MORTAR MIXES

A. Measurement and Mixing: Measure natural hydraulic lime (NHL) materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

1. Mixing Bedding and Pointing Mortar: Thoroughly mix NHL materials and sand together before adding any water. Then mix again adding water in small portions until mortar reaches desired consistency.
2. NHL mortars may be retempered throughout the day.
3. Keep NHL mortars out of direct sunlight and wind while in batch mixers and in mortar pans.
4. No NHL mortar may be reused if allowed to become stiff or hardened.

B. Do not use admixtures in lime mortars.

C. Mortar Proportions: Mix mortar materials per the manufacturer's recommendations. Manufacturer's recommendations shall be in writing and submitted for pre-approval prior to commencing work per specifications above. Refer 1.7 Submittals, A. Product Data above.

PART 3 - EXECUTION

3.1 RESTORATION SPECIALISTS

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.

B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical-cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Keep wall wet below area being cleaned to prevent streaking from runoff.
3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

C. Prevent mortar from staining face of surrounding masonry and other surfaces.

1. Cover sills, ledges, projections, windows and doors to protect from mortar droppings.
2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
3. Immediately remove mortar in contact with exposed masonry and other surfaces.
4. Clean mortar splatters from scaffolding at end of each day.

3.2 STONE REMOVAL AND REPLACEMENT (Drawing S-2)

A. At locations indicated, remove stones that are damaged, spalled, or deteriorated. Remove stones and vent in south wall for new door opening D104. Carefully remove entire stones from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size salvaged stone units.

1. When removing single stones, insert by hand used sawsall blade into soft mortar joint and carefully cut around stones to be removed.
2. Salvage stones of exterior grade with good exterior faces still intact.

B. Support and protect remaining masonry that surrounds removal area. Maintain reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Consultant of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole stones as possible.

1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes, and water.
2. Store brick for reuse. Store off ground, on skids, and protected from weather.

E. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

F. Replace removed damaged stone with other approved removed and salvaged stone. Do not use broken stones unless they can be cut for use as king or queen closers.

G. Install replacement stone into bonding and coursing pattern of existing stone. If cutting is required, use hand chisels to cut masonry with clean, sharp, eased edges.

1. Maintain joint width for replacement units to match existing joints.

H. Lay replacement stone and bricks with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.

1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
2. Rake out mortar used for laying brick ¾" deep before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.
3. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

3.3 WIDENING JOINTS

A. No mortar joint or joints shall be widened for any reason. All mortar joints shall remain as wide as original construction and no more.

B. Contractor shall replace at his expense any bricks where mortar joints have been purposely or inadvertently widened to achieve original joint widths throughout the entire project.

3.4 CLEANING MASONRY, GENERAL

A. Proceed with cleaning in an orderly manner; work from top to bottom and from one end of each elevation to the other. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.

B. Use only those cleaning methods indicated for each masonry material and location.

1. Use only non-ferrous wood or heavy nylon bristle brushes for cleaning.
2. No pressure washing equipment shall be used on any portion of the project at any time.

3. No pressure washing equipment shall be permitted on the job premises to prevent inadvertent use of pressure washing equipment on the project masonry walls, or any other component of the barn.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry and any other adjacent surfaces.

D. Water Application Methods:

1. Water Application: Soak or rinse masonry surfaces by applying water continuously and uniformly to limited area for time needed to clean walls. Apply water at low pressures not to exceed 40 to 50 psi and low volumes in multiple fine sprays using multiple position spray nozzles.

3.5 PRELIMINARY CLEANING

A. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include chalked, peeling or cracked paint surfaces, calking, asphalt, and tar.

1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
2. Comply with written and approved Cleaning and Quality Control Programs.
3. Remove paint and calking with alkaline paint remover.
   a. Repeat application up to as many times as needed.

3.6 CLEANING STONEWORK

A. Non-Detergent Cleaning:

1. Cold-Water Wash: Use cold water applied by 40 to 50 psi low-pressure spray.
2. Scrub painted masonry and repaired bare brick walls with non-ferrous wood or nylon bristle brushes while washing, lightly rinsing walls with low pressure water hose.

B. Detergent Cleaning:

1. Wet masonry with low pressure (40 to 50 psi) garden hose spray.
2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
3. Rinse with cold water applied by low-pressure spray to remove detergent solution and soil.

4. Repeat cleaning procedure above where required to produce cleaning effect necessary prior to painting surfaces.

C. Mold, Mildew, and Algae Removal:

1. Wet masonry with cold water applied by 40 to 50 psi low-pressure spray.
2. Apply mold, mildew, and algae remover by brush.
3. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.
4. Rinse with cold water applied by 40 to 50psi low-pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect necessary prior to painting surfaces.

3.7 REPOINTING MASONRY

A. Rake out and repoint joints to the following extent:

1. All joints missing mortar or with deteriorated, damaged, powdery or weathered more than 3/8" deep are to be cleaned and repointed.
2. Joints where mortar is missing or where they contain holes.
3. Cracked joints where cracks can be penetrated at least 3/8 inch by a knife blade.
4. Cracked joints where cracks are 1/16 inch or more in width and of any depth.
5. Joints where they sound hollow when tapped by metal object.
6. Joints where they are worn back 3/8 inch or more from surface.
7. Joints where they are deteriorated to point that mortar can be easily removed by hand, without tools.
8. Joints that have been repointed with Portland mortar.
9. Joints where they have been filled with substances other than soft lime mortar.
10. Joints indicated as sealant-filled joints.

B. Do not rake out and repoint joints where not required.

C. Rake out joints as follows, according to procedures approved in writing as written into the Restoration program and as demonstrated in approved mockup:

1. Remove mortar from joints to depth of ¾", but not less than that required to expose sound, unweathered mortar.
2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Consultant.

a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders without Consultant's written approval based on approved Quality-Control Program. Hand held power grinders shall only be approved for use in removing hard Portland mortar joints
b. If approved in writing by Consultant, cut out center of Portland mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and resilient mallet. Strictly adhere to approved Quality-Control Program

D. Notify Consultant of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

E. Pointing with Mortar:

1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/4 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than ¾ inch. Fully compact each layer and allow to become thumbprint hard before applying next layer.
4. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
5. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
6. Cure mortar by maintaining in a damp condition for at least 7 consecutive days including weekends and holidays during the hot, dry seasons of the year.

    a. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
    b. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.

7. Cure mortar by maintaining in a damp condition for at least 7 consecutive days including weekends and holidays during the cold winter months of the year.

    a. Acceptable curing methods include building and heating enclosures, placing electric blankets over masonry work and covering with plastic sheeting to protect electric blankets from weather.

b. Adjust curing methods to ensure that pointing mortar is protected from excessive drying, curing or freezing during the first 7 days of set up time.
c. Prior to removing the heating and protection systems, check mortar to make sure it has set up to at least a semi-hard condition before removing heat and protection covers. If still soft, continue to heat and protect mortars until semi-hard conditions in mortars exist.

8. Hairline cracking within the mortar or mortar separation at edge of a joint is acceptable. Completely remove such mortar and repoint if the following occurs:

1) Fill joints to a depth equal to joint width, but not more than 1/2 inch deep or less than 1/4 inch deep if pointing is damaged from freezing or excessive drying conditions, is too loose for reasonable set-up conditions or has bled down onto the bricks.

3.8 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure not to exceed 40 to 50 psi.

1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.
3. Do not use pressure washers.

B. Wash adjacent woodwork and other non-masonry surfaces. Use detergent and soft brushes or cloths.

C. Install all protections set in place to protect windows and doors during masonry work.

D. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Wash pavement surfaces to remove mortar, dust, dirt, and stains.

3.9 FIELD QUALITY CONTROL

A. Owner's Project Representatives is the Consultant: Consultant responsibilities at the site include observing progress and quality of portion of the Work completed. Allow Consultant free access to use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.

B. Notify Consultant in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Consultant has had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold locations.

END OF SECTION 040120

SECTION 040523 - MASONRY ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Rainscreen Drainage Planes:
   1. Adhered Thin Natural Stone:
      a. 10mm Sure Cavity (SCMM2532)

B. Window Rough Opening Sill Drainage Plane:
   1. Window Drainage Plane. (WDP 5000)

C. Weep Systems:
   1. Adhered Thin Natural Stone:
      a. Wall Opening Weeps. (WOW 9095)

D. Masonry Accessories:
   1. L & R Weep Screed. (LR 3501)
   2. Weep Screed Deflector. (WSD 1309)
   3. Vented Edge Metal. (VMEM 3168)
   4. Moisture Diverter. (DS 2858)
   5. Corrugated Lath Strips (CLS-2316)
   6. Starter Strip (CLSS-2316)

1.2 RELATED SECTIONS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 04 20 00 - Unit Masonry.

C. Section 06 10 00 - Rough Carpentry.

1.3 REFERENCES

A. ASTM International (ASTM):
   1. ASTM C 1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings; 2008.
   2. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2010.
   3. ASTM D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 1996 (2209).
   4. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 1991 (2008).
   5. ASTM D 4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products; 2000 (2007).
   6. ASTM SEQ CHAPTER 1E 96/E 96M - Standard Test Methods for Water Vapor Transmission of Materials; 2005.

B. CAN/CGSB 148.1 No. 7.3 - Methods of Testing Geotextiles and Geomembranes Grab Tensile Test for Geotextiles; 1992.

C. ICC-ES EG 114 - Low Temperature Flux.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Provide drawings of special joint conditions.

D. Sustainable Design Submittals:
1. Submit invoices and documentation from manufacturer of the amounts of pre-consumer and post-consumer recycled content for products specified.
2. Submit invoices and documentation showing manufacturing locations and origins of materials for products manufactured and sourced within 500 miles of project location.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.

B. Installer Qualifications: Minimum 2 year experience installing similar products.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship is approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.6 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements: Store materials in clean, dry, inside area in accordance with manufacturer's instructions. Protect materials from damage during handling and installation.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 WARRANTY

A. Manufacturer Warranty: Submit manufacturer's standard 20 year limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Masonry Technology, Inc, which is located at: 24235 Electric St. P. O. Box 214; Cresco, IA 52136; Toll Free Tel: 800-879-3348; Tel: 563-547-1122; Fax: 563-547-1133; Email:request info (info@mtidry.com); Web:www.mtidry.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 CAVITY DRAINAGE PLANES - 10mm CONTROL CAVITY (CC 4810)

A. Description: Provides separation between wood framing, insulation and gypsum board from concrete or masonry wall substrates and providing ventilation of these cavities.

B. Materials: High impact polystyrene sheets, 0.024 inch (0.61 mm) thick, formed with corrugations.
1. Roll Length: 50 feet (15.24 m).
2. Roll Width: 31.5 inches (800 mm).
3. Angled - Channel Depth: 7/16 inch (11mm).

C. Performance Criteria:
1. Fungi Resistance: No Growth; ASTM C 1338.
2. Ultra-violet (UV) Exposure: No Peeling, chipping, cracking, flaking, pitting, crazing, erosion or other deleterious effects were observed under a 5X magnification; ASTM G 154.
3. Compressive Strength: 5.4 psi at 10 percent strain; ASTM D 1621.

2.3 WINDOW SUB-SILL DRAINAGE PLANES WINDOW DRAINAGE PLANE (WDP 5000)

A. Description: Creates a horizontal and vertical void that separates the bottom side of the window frame from the top (slope to drain) sill pan flashing and the back side of the veneer from the face of the sill pan flashing.

B. Materials: High impact polystyrene sheets, 0.024 inch (0.61 mm) thick, formed with corrugations and bent into L-Shape, 5 inches (127 mm) wide by 9 inches (229 mm) high, to fit on top of sub-sill area of window rough opening prior to window installation.

2.4 WEEP SYSTEMS FOR ADHERED THIN NATURAL STONE

A. Wall Opening Weeps (WOW 9095):
1. Description: Forms the bottom edge of scratch coat of mortar and the bottom edge of the adhered thin natural stone veneer adhering mortar and grouting mortar at horizontal terminations (tops of windows - door and wall openings and at horizontal top surfaces of non-frost affected details (stoops - ledges etc.) to create tunnels/channels that reach from the face of the adhered veneer into the vertical drainage plane (the rainscreen drainage plane) created by Sure Cavity.
2. Materials: High impact polystyrene sheets, 0.024 inch (0.61 mm) thick, formed with corrugations and bent into L-Shape, 9 inches (229mm) on one leg by 5 inches (127mm) on other leg.

2.5 MASONRY ACCESSORIES

A. Vented MTI Edge Metal (VMEM 3168):
1. Description: Formed metal termination to accommodate rainscreen drainage plane material and weep.
2. Material: 26 gauge galvanized steel, bent into "J" shaped channel, with long vertical leg and short leg at 5 degree angle out from other leg and slots punched into bottom edge.

B. Moisture Diverter (DS 2858):
1. Description: Forms a diversion for moisture above wall openings such as windows and doors, directing the moisture to one side of opening and away from these moisture sensitive wall details.
2. Materials: 26 gauge galvanized steel, bent into "L" shaped channel, with long vertical leg and short leg at 65 degree angle out from other leg.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 VERIFICATION OF CONDITIONS

A. Verify that field conditions are acceptable and are ready to receive this work.

B. Verify that related items provided under other sections are properly sized and located.

3.4 DRAINAGE PLANE INSTALLATION

A. Install systems in accordance with manufacturer's instructions and as follows.
1. Rainscreen Drainage Plane for (Adhered) Thin Natural Stone.
a. Weep Screed - L & R Weep Screed (LR 3501)
1) Install L & R Weep Screed at bottom of (adhered) thin natural stone veneer wall with a 3-1/2 inches (89 mm) back flange transitioning the construction joint created by the top outside corner of the foundation wall and the bottom edge of the wall sheathing.
2) The 3-1/2 inches (89 mm) back flange should be fastened to the framed sheathing only with approximately 1-1/2 to 2 inches (38 to 50.8 mm) overlapping down over face of foundation.
b. Rainscreen Drainage Plane: Sure Cavity.
1) Install Cavity over acceptable weather resistant barrier (WRB) and flashing system, with fabric side facing to weather.
2) Back wrap 4 inches (102 mm) fabric skirt at bottom edge.
3) Sure Cavity and the WRB should overlap 3-1/2 inches (89 mm) back flange of L & R Weep Screed (LR 3501).
4) The back wrapped bottom edge of Sure Cavity should be fully embedded

in bottom of L & R Weep Screed.

c. Wall Opening Weeps (WOW 9095)
   1) Install Wall Opening Weeps (WOW 9095) with 9 inches (229 mm) vertical leg up on wall on weather resistant barrier (WRB) and flashing and 5 inches (127 mm) horizontal down on flashing and extending perpendicular out from face of wall 10-1/2 inches (267 mm) on center.
   2) Clean out mortar from top slot of horizontal leg between application of scratch coat and adhering and joint grouting mortar application. Cut off horizontal leg at wall line while grouting mortar is still plastic and finish tool joint.

2. Window Sub-Sill Drainage Plane (Rainscreen Drainage Plane for Window Rough Opening Sill. View examples at http://www.mtidry.com/hyperspecs/ and Wall Openings.
   a. Install Window Drainage Plane (WDP 5000) on the horizontal and vertical surfaces of the waterproofing system (sill pan) at bottom of window rough opening.
   b. Minimize fastening vertical leg only.
   c. Fabricate horizontal leg of window drainage plane to fit dimensions of horizontal plane of rough opening.
   d. Install window.

3.5 WEEP SYSTEM INSTALLATION

A. Install systems in accordance with manufacturer's instructions and as follows:
   1. Weep Systems for Adhered Thin Natural Stone.
      a. Weep Screed - L & R Weep Screed (LR 3501)
         1) Install L & R Weep Screed at bottom of adhered veneer wall, with 3-1/2 inches (88.9 mm) back flange transitioning the construction joint created by the top outside corner of the foundation wall and the bottom edge of the wall sheathing.
         2) The 3-1/2 inches (88.9 mm) back flange shall be fastened to the framed sheathing only, with approximately 1-1/2 to 2 inches (38 to 50.8 mm) overlapping down over face of foundation.
      b. Rainscreen Drainage Plane: Sure Cavity
         1) Install Sure Cavity over appropriate weather resistant barrier (WRB) and flashing system with fabric side facing to weather.
         2) Back wrap 4 inches (102 mm) fabric skirt at bottom edge.
         3) Sure Cavity and the WRB shall overlap 3-1/2 inches (88.9) back flange of L & R Weep Screed (LR 3501).
         4) The back wrapped bottom edge of Sure Cavity should be fully embedded in bottom of L & R Weep Screed.
      c. Wall Opening Weeps (WOW 9095):
         1) Install Wall Opening Weeps (WOW 9095) with 9 inches (229 mm) vertical leg up on wall on weather resistant barrier (WRB) and flashing and 5 inches (127 mm) horizontal leg down on flashing and extending perpendicular out from face of wall, 10-1/2 (267 mm) inches on center.
         2) Clean out excess mortar from top slot of horizontal leg between application of scratch coat and adhering and joint grouting mortar application. Cut off horizontal leg at wall line while grouting mortar is still plastic and finish tooling mortar joint.

3.6 MASONRY ACCESSORY INSTALLATION

A. Install systems in accordance with manufacturer's instructions and as follows.
   1. Weep Systems for Thin Stone Veneer:
      a. Weep Screed - L & R Weep Screed (LR 3501).

1) Install L & R Weep at bottom of thin veneer wall with 3-1/2 inches (88.9 mm) back flange transitioning the construction joint created by the top outside corner of the foundation wall and the bottom edge of the wall sheathing.
2) The 3-1/2 inches (88.9 mm) back flange should be fastened to the framed sheathing only with approximately 1-1/2 to 2 inches (38 to 50.8 mm) overlapping down over face of foundation.

b. Weep Screed Deflector (WSD 1309).
1) Install Weep Screed Deflector at bottom of thin veneer wall with back flange transitioning the construction joint created by the top outside corner of the foundation wall and the bottom edge of the wall sheathing.
2) The 3-1/2 inches (88.9 mm) back flange is installed behind the 3-1/2 inches (88.9 mm) back flange of the L & R Weep Screed (LR 3501).
3) The Weep Screed Deflector is fastened (nailed) to the framing wall only.
4) The Weep Screed Deflector should overlap the foundation wall approximately 1-1/2 inches to 2 inches (38 to 50.8 mm).

2. Vented Edge Metal (VMEM 3168) for enclosing and weeping the bottom edge of Sure Cavity at the bottom of wall panels:
a. Vented Edge Metal (VMEM 3168) use at bottom of wall.
1) Install Vented Edge Metal at bottom of wall to transition construction joint created by bottom edge of sheathing and top outside edge of foundation wall.
2) Apply flashing tape to the top edge of Vented Edge Metal and onto sheathing.
3) Install WRB over 3-1/2 inches (88.9 mm) back flange of Vented Edge Metal.
4) Back-wrap 4 inches (102 mm) fabric skirt of Sure Cavity for bug screen.
5) Install edge of Sure Cavity over nailing flange and into Vented Edge Metal.
6) Install siding.

3. Floor Edging (FE 8555) for interior of below grade (basement) moisture management:
a. Install along the perimeter of concrete floor against the concrete masonry foundation wall on footing with short leg vertical and long leg horizontal.
b. Fasten Floor Edging to wall at 2 feet (0.61 m) on center.
c. Install top of Floor Edging vertical leg at least 1 inch (25.4 mm) higher than concrete slab.
d. Install top edge of Floor Edging at least 3 inches (76.2 mm) higher than bottom of weep cores.

3.7 PROTECTION

A. Protect installed thin veneer system from damage during construction.

B. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 042000 - UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Face brick.

B. Engineered, reinforced concrete masonry unit (CMU) assemblies.

C. Non-reinforced concrete masonry unit (CMU) assemblies.

D. Decorative Concrete Masonry Units.

E. Mortar.

F. Masonry grout.

G. Masonry accessories.

1.02 RELATED REQUIREMENTS

A. Section 04 0120 - Historic Stone & Brick Masonry.

B. Section 07 2113 - Thermal Insulation.

C. Section 07 6200 - Flashing & Sheet Metal.

1.03 REFERENCE STANDARDS

A. Section 01 4200. In addition to requirements shown or specified, comply with applicable provisions of following for design, materials, fabrication, and installation of component parts:

1. ACI 530.1 Specifications for Masonry Structures.

1.04 SUBMITTALS

A. General: Submit in accordance with Section 01 3300.

1. Comply with ACI 530.1.
2. Submit Section 04 0510 submittals simultaneously with submittals for this section.

B. Product Data: For each type masonry unit, accessory, mortar, mortar color, masonry cleaning agent and other proprietary products.

C. Shop Drawings: Comply with ACI 530.1.

D. Samples:

1. Face Brick: Three sets of five individual units of each type illustrating extreme variations in color and texture in manufacturer's standard range.
2. CMU: Two of each type of unit.
3. Special and Standard Shapes: Two of each type of unit.
4. Accessories: Coordinate submittal with Work of Section 04 0510.

E. Informational Submittals: Submit following packaged separately from other submittals.

1. Test Reports: For each type of brick and CMU from independent testing laboratory certifying that materials meet or exceed specified requirements.
2. Certifications specified in Quality Assurance article.
3. Qualification Data: Installer's qualification data.
4. Manufacturer's instructions.
5. Manufacturer’s certification of acceptable cleaning solution.

1.05 QUALITY ASSURANCE

A. Single Source Responsibility:

1. Face Brick: Uniform texture and color, or uniform blend within ranges accepted for these characteristics, from one manufacturer for each product required.
2. Exposed CMU: Uniform texture and color from one manufacturer for each different product required for each continuous surface or visually related surfaces.

B. Installer Qualifications: Experience Documented experience on at least five projects of similar nature in past five years.

C. Comply with ACI 530.1.

D. Testing and Inspection Services: Document to Architect's satisfaction, based on evaluation of laboratory submitted criteria that laboratory has experience and capability to conduct satisfactory testing without delay to Work.

E. Fire Resistance Rated Masonry: UL Listed Assemblies or certified to be in compliance with requirements for materials and installation established by governing authorities for construction and fire-resistance rating indicated.

1. Materials: UL Classified with UL Classification Marking.

F. Owner reserves right to hire independent masonry consultant to review submittals, procedures, and installation. Installation items subject to review includes, but is not limited to, foundations, flashing, weeps, cavities, joints, tolerances, and cleaning.

G. Certifications: Submit following:

1. Manufacturer's certificates attesting that materials furnished meet or exceed specified requirements.
2. Certification of acceptance of masonry cleaning agent by masonry unit, mortar, and mortar color manufacturer.

1.06 FIELD SAMPLES

A. General: Comply with Section 01 4000.

B. Sample Installation: Construct field sample 1800 mm (6 feet) long by 1200 mm (4 feet) high.

1. Locate on site where directed.
2. Show construction techniques, including following:
    a. Color range of exposed masonry and mortar joints.
    b. Tooled joints.
    c. Back-up CMU conditions, including exposed joint work.
    d. Base course with flashing and weeps.
    e. Fluid applied air barrier.
    f. Cavity wall insulation.
    g. Window sill and head with flashing end dam.
    h. Shelf angle (including control and expansion joint condition).
    i. Masonry sills.
    j. Expansion and control joints.
    k. Ties, anchors, and fasteners.

1.07 PRE-INSTALLATION CONFERENCE

A. Conduct pre-installation conference in accordance with Section 01 3119.

1. Review requirements of Contract Documents and submittals.
2. Review requirements for inspection and testing, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures and sequencing.
3. Review anchor, tie, and flashing installation requirements.

4. Review requirements of field sample mock-up on site.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 01 6000.

B. Masonry: Store masonry units off ground to prevent contamination by mud, dust or materials likely to cause staining or other defects.

1. Cover materials to protect from elements.
2. Handle units on pallets or flat bed wheel barrows.
3. Do not permit free discharge from conveyor units or transporting loose in mortar trays or buggies.

1.09 PROJECT CONDITIONS

A. Environmental Requirements, Hot and Cold Weather Conditions: Comply with ACI 530, ACI 530.1, and BIA Technical Note 1 and International Building Code Recommended Practices and Specifications for Cold Weather Masonry Construction of International Masonry Industry All-Weather Council.

1. Cold Weather Protection: Mortar setting accelerators and admixtures for cold weather construction not allowed.
2. Hot Weather Protection: Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperature of 37º C (99º F) or greater in shade with relative humidity less than 50 percent.
    a. When ambient air temperature exceeds 37º C (99º F), or 32º C (90º F) with wind velocity in excess of 13 km/h (8 MPH), limit installation of mortar to 1200 mm (4 feet) ahead of masonry and install masonry within one minute of spreading mortar.
3. Temperature: Do not proceed with work if ambient temperature is projected to fall below 4º C (40º F) within 72 hours after completion of cleaning.

B. Cleaning, General: Comply with Recommended Practices and Specifications for Cold Weather Masonry Construction of IMI.

1. At brick surfaces, comply with BIA Technical Note 20.
2. At concrete masonry, comply with NCMA Tek Notes, Series 8 – Maintenance and Cleaning.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNIT

A. Design Requirements: Provide unit masonry that develops following installed compressive strengths (f'_m).
1. Concrete Unit Masonry: f'_m = 2000 psi, minimum.

B. Concrete Masonry Units (CMU): ASTM C90, load bearing, hollow and 100 percent solid units.
1. Weight Classification: Lightweight, less than 1682 kg/m3 (105 PCF) [Normal weight, greater than 2002 kg/m3 (125 PCF) and medium weight, 1682 - 2002 kg/m3 (105 - 125 PCF).
2. Aggregate: Lightweight, ASTM C331 Normal weight, ASTM C33.
3. Type: I, moisture controlled.
4. Water Absorption: ASTM C140.
    a. Lightweight CMU: Maximum 288 kg/m^3 (18 lb/ft^3)
    b. Medium Weight CMU: Maximum 240 kg/m^3 (15 lb/ft^3).
    c. Normal Weight CMU: Maximum 208 kg/m^3 (13 lb/ft^3).
5. Size: Nominal face dimension 400 mm (16 inches) long by 200 mm (8 inches) high by thickness indicated.
6. Concrete Brick Size: 92 by 57 by 194 mm (3-5/8 by 2-1/4 by 7-5/8 inches).
7. Fire Rated CMU: Provide block complying with UL requirements for ratings indicated with UL Classification Marking.

8. Shapes: Provide special shapes where required for bond beams, lintels, corners, jambs, sash, control joints, pilasters, headers, and other special conditions.
9. Corners: Bullnose Square-edged units for outside corners exposed to view, unless indicated otherwise.
10. Standard Faces: Manufacturer's standard texture and color, unless indicated otherwise.

2.02 MORTAR AND GROUT MATERIALS

A. Mortar and Masonry Grout: Provide in accordance with Section 040510. Comply with ACI 530.1.

B. Masonry Grout: Comply with ACI 530.1.
1. ASTM C476, fine aggregate in spaces less than 50 mm (2 inches).
2. Minimum strength equal to (3000 PSI), whichever is greater.
3. Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

C. Water Repellent Admixture: Compatible with integral water repellent admixture used during manufacture of concrete masonry units.
1. Acceptable Product:
a. Anti-Hydro Waterproof Mortar, Anti-Hydro International, Flemington, NJ.
b. Accepted Substitute in accordance with Section 01 2500.

D. Water Repellent Admixture: Compatible with, and by same manufacturer as, integral water repellent admixture used during manufacture of concrete masonry units.
1. Acceptable Product:
a. Dry-Block, WR Grace Company, Cambridge, MA.
b. Rheopel Mortar Admixture, Master Builders, Cleveland, OH.
c. Any Suggested Substitution will be reviewed in accordance with Section 01 2500.

2.03 REINFORCING STEEL

A. Steel Reinforcing Bars:
1. Billet Steel: ASTM A615, Grade 60.
2. Maximize use of recycled scrap steel with minimum of 60 percent.

B. Deformed Reinforcing Wire: ASTM A496.

C. Welded Wire Fabric: ASTM A185.
1. Deformed Welded Wire Fabric: ASTM A497.

D. Vertical Bar Positioner: Open or closed end welded wire configuration designed to secure placement of vertical reinforcing bars, up to No. 8 bar, in place during grouting.
1. Acceptable Products: D/A-811, D/A-812, or D/A-816, Dur-O-Wal.

E. Vertical Bar Connector: Connection device for securing two pieces of reinforcing steel together with minimum 150 mm (6 inch) overlap, continually adjustable, for 13 mm (1/2 inch) diameter bars.
1. Acceptable Products: BarLoc No. 375, Heckman.

2.04 MASONRY ACCESSORIES

A. Anchors and Ties, Reinforcing, Horizontal Joint Reinforcing, Joints, CMU Control Joint Strips, Masonry Flashing, Through-Wall Flashing, Masonry Flashing Mastic, Weeps, Cavity Vents, Cavity Drainage Materials, and Masonry Cleaning Agents: Provide in accordance with Section 04 0510.

B. Surface treated for water repellency and to limit dust generation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine conditions and proceed with work in accordance with Section 01 7300.
1. Do not proceed until foundation inspection stipulated by ACI 530.1 is performed.

2. Verify items provided by other Sections of work are properly sized and located.
3. Examine supporting members to ensure surfaces are at proper elevation and are free from dirt or other deleterious matter.

3.02 PREPARATION

A. Receive approval for required field sample mock-up before proceeding with installation.

B. Establish lines, levels, and coursing; protect from disturbance.

C. Provide temporary bracing during erection of masonry work. Maintain in place until building structure provides permanent support.

D. Provide temporary supports under masonry support systems when necessary. Retain in place until mortar has attained adequate strength.

E. Wetting Masonry:
1. CMU: Do not wet concrete masonry units.
2. Brick: Wet brick made from clay or shale which have initial rates of absorption (suction) of more than 20 grams per 194 square centimeters (20 grams per 30 square inches) per minute when tested in accordance with ASTM C67.
    a. Use wetting methods recommended by manufacturer to achieve optimum bonding with mortar.

3.03 INSTALLATION

A. General: Comply with BIA Technical Notes and NCMA TEK and with ACI 530.1 for engineered, reinforced CMU work.

B. Tolerances: Remove work not conforming to specified tolerances and reconstruct to proper tolerances.
1. Variation from Plumb: 6 mm (1/4 inch) per story non-cumulative; 10 mm (3/8 inch) maximum in two stories or more.
2. Variation from Level Coursing: 3 mm in 900 mm (1/8 inch in 3 feet); 6 mm in 3000 mm (1/4 inch in 10 feet); 13 mm (1/2 inch) maximum.
3. Variation from Unit to Adjacent Unit: 0.8 mm (1/32 inch) maximum.
4. Variation from Plan Location: 6 mm in 3000 mm (1/4 inch in 10 feet) and 13 mm (1/2 inch) maximum in 6000 mm (20 feet) or more.
5. Alignment of Columns and Pilasters: Maximum 6 mm (1/4 inch) from true line.
6. Variation in Sizes of Wall Openings: Minus 0 mm (inch) to plus 6 mm (1/4 inch).
7. Variation in Location of Wall Openings: Plus or minus 6 mm (1/4 inch).
8. Variation of Joint Thickness: 3 mm in 900 mm (1/8 inch in 3 feet).
9. Maximum Variation from Cross Sectional Thickness of Walls: Plus or minus 6 mm (1/4 inch).

C. Masonry Flashing: Clean surfaces to receive flashing; remove rough projections to avoid damage to flashing.
1. Use longest pieces practicable.
2. Place stainless steel drip edge over brick, shelf angle, or weep plane. Extend flashings from top of drip edge and turn up minimum of 200 mm (8 inches) in cavity.
    a. At CMU backup, secure flashing into reglet mortar joint at backup wythe.
    b. At sheathing and steel stud backup: Extend flashing behind sheathing and attach to flange at runner. Where sufficient turn-up dimension is not available, extend flashing over face of sheathing and secure flashing with termination bar. Set top of flashing in full bed of silicone sealant against sheathing. Tool sealant fillet joint at top of termination bar to establish watertight application. Fasten termination bar to studs at each stud location with gasketed, zinc-plated, polymer coated, self tapping fastener.
3. Lap joints minimum of 100 mm (4 inches) and seal.

a. At stainless steel, composite, and self-adhering flashing, use self-adhering termination tape for full depth and turn-up of flashing. Seal cuts, seams, lap joints, end dams, and junctures of jamb flashing with head and sill flashing.
b. At flexible flashing, seal with manufacturer's recommended materials.

4. Continue flashing around corners. Ensure flashing material is not interrupted in horizontal plane at corners.
5. At stainless steel and copper flashing, extend flashing maximum 6 mm (1/4 inch) beyond outside face of brick and bend downward at 0.78 rad (45 degree) angle to create water drip. Trim laminated flexible flashing flush with face of wall prior to final cleaning.
6. Apply Masonry Flashing Mastic to surface to which flashing is to be applied to obtain watertight bond. Prevent staining at face of masonry unit due to mastic.
7. Lay masonry units in full bed of mortar, applied directly on top of flashing occurring over steel lintels or shelf angles. Do not sandwich flashing between layers of mortar.
8. Form watertight end dams at masonry openings and at terminations of copings, sills, lintels, and other discontinuous horizontal runs.
    a. Typically, form watertight end dams at each end of flashing into head joints.
    b. Where abutting adjacent vertical wall surfaces, extend flashing through control joint and turn flashing into adjacent wall to provide means to weep to exterior.
    c. Ensure end dams provide positive drainage to exterior.
    d. Anchor sills, lintels, copings, and other items with dowels through flashing. Seal penetrations as required by flashing manufacturer.
9. Jamb Flashing: At openings, extend continuously to form watertight seal from head flashing or underside of lintel to sill flashing or end dams at masonry openings. Seal to underside of head flashing or lintel and integrate with sill flashing or end dams to prevent flow of water beyond seam. Ensure proper flow to weeps. Set flanges in sealant beds. Extend leg past edge of veneer unit to ensure proper enclosure of cavity.
    a. Preformed foam tape sealant, specified in Section 079200, sized to completely fill cavity depth, may be acceptable in lieu of jamb flashing pending Architect’s review.
10. Install Termination Bar to secure top of flashing to substrate. Set termination bar in continuous bed of sealant, and fasten at 400 mm (16 inches) oc. Seal top of termination bar with sealant fillet joint in accordance with Section 07 9200.
11. Through-Wall Flashing: Locate continuous under copings and at locations indicated.
    a. Extend flashing 6 mm (1/4 inch) beyond outside face of both sides of wall and bend downward at 0.78 rad (45 degree) angle to create water drip.
    b. Seal around penetrations, such as at reinforcing and at dowels used to anchor coping stones, for watertight installation.

D. Mortar Beds: Except as indicated otherwise, place masonry in full bed of mortar, properly jointed with other work, to lines and levels indicated. Align head joints plumb within vertical tolerance.
1. Maintain masonry courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.
2. Apply mortar to obtain full vertical head joints.
3. Slushing of head and collar joints or furrowing of bed joints not allowed.

E. Brick: Lay in running bond. Course three brick units and three mortar joints to equal 200 mm (8 inches). Avoid use of brick less than half length of full stretcher.

F. CMU: Lay in running bond and other bond or pattern as indicated. Course one block unit and one mortar joint to equal 200 mm (8 inches).

G. Banding: Comply with NCMA TEK 5-2A: Clay And Concrete Masonry Banding Details. Use two lengths of continuous wire reinforcing at veneer wythe, clipped to tie extending from wall back-up. Embed wire reinforcing fully in mortar. Space reinforcing at 400 mm (16 inches) oc maximum vertically.
1. Vertical joints: Provide sealant joints.

2. Coordinate with work of Section 04 7310, 03 4800, 04 7200.

H. General Installation Requirements:
   1. Fully bond intersections, external corners and internal corners, except where indicated otherwise.
   2. Do not shift or tap masonry units after mortar has taken initial set. Where adjustment must be made, remove mortar and replace.
   3. Remove excess mortar as work progresses.
   4. Perform Project site cutting with proper tools to provide straight unchipped edges. Take care to prevent breaking masonry unit corners or edges.
   5. Form flush mortar joints at following conditions:
      a. At above-grade CMU surfaces to receive bituminous dampproofing.
      b. At below grade surfaces to receive waterproofing.
      c. At interior, exposed CMU surfaces.
      d. At locations where interior resilient base is indicated.
   6. Form concave mortar joints for typical exterior, exposed brick CMU surfaces.
   7. Provide pressure relieving joints at top of non-load bearing walls by placing continuous joint filler (no mortar) in horizontal joint immediately beneath shelf angle or structure.
   8. Fire Rated Assemblies: Comply with requirements of UL Listed Assembly.
      a. Provide firestops consisting of UL Listed safing and fire-rated sealant as specified in Section 07 8400 at control joints and at top of fire-rated masonry walls.
   9. Isolate masonry partitions from vertical structural framing members with control or expansion joint as indicated.
   10. Control Joints:
      a. Control Joint Filler: Place in brick control joints.
      b. CMU Control Joint Strip: Place in CMU control joints.
   11. Horizontal Expansion Control Joints: Eliminate mortar from horizontal joint immediately beneath shelf angle and lintels to provide pressure relieving joints. Fill space with expansion joint filler.
   12. Do not install cracked, broken, or chipped masonry.

I. Cavity Wall:
   1. Mortar: Maintain cavity clear of excess mortar and debris.
      a. Bevel top of mortar to prevent creation of mortar droppings prior to placing masonry units. Carefully place masonry units to minimize mortar squeezed out of joint. Plaster mortar, squeezed out during placement of unit, onto back of masonry unit.
      b. Prevent accumulation of mortar droppings by placing boards in cavity, cut slightly narrower than cavity width, and supported on wall ties.
      c. When masonry reaches next level for placement of reinforcement, raise boards by attached wires at ends and discard debris from boards.
      d. Replace mortar dropping boards on ties for next courses.
      e. Continue process as work progresses to top of wall.
   2. Build inner wythe ahead of outer wythe to receive bituminous dampproofing air barrier and cavity wall insulation.
   3. Coordinate placement and provisions for dampproofing air barrier and board insulation with Sections 07 1113.
   4. Cavity Drainage Material: Place cavity drainage material immediately above flashing in cavities.
   5. Cavity Drainage Material: In cavities, place pea gravel to height equal to height of first course, but not less than 50 mm (2 inches), immediately above top of flashing embedded in wall, as masonry construction progresses, to splatter mortar droppings and to maintain drainage.

J. CMU Lintels and Bond Beams: For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.

1. Provide minimum bearing of 200 mm (8 inches) at each jamb, unless otherwise indicated.
2. Provide bond beams at top of walls and other locations where indicated; provide masonry lintels above door openings where indicated.
3. Reinforce bond beams and lintels with minimum of two No. 5 bars and fill solid with grout.
4. Discontinue bond beams at control and expansion joints.

K. Loose Steel Lintels: Grout cells in CMU solid immediately below steel lintels.

L. Bond Beams and Lintels: Provide bond beams at top of walls and other locations where indicated; provide masonry lintels above door openings where indicated.
1. Provide minimum lintel bearing of 200 mm (8 inches) at each jamb, unless otherwise indicated.
2. Discontinue bond beams at control and expansion joints.

M. Masonry Grouting: Comply with ACI 530.1 and with NCMA TEK 3.2 – Grouting Concrete Masonry Walls.
1. Place mortar only under block webs at first course to allow grout in cores to come in contact with concrete slab.
2. Stack wall 1500 mm (5 feet) maximum for each grout lift.
3. Grout CMU cores indicated.
4. If grouting is stopped more than one hour, terminate grout 38 mm (1-1/2 inch) from bed joint.
5. Do not fill CMU cores with mortar as work progresses.

N. Placing and Grouting Vertical Reinforcing at Engineered Masonry: Comply with ACI 530.1 and NCMA TEK 3.2 – Grouting Concrete Masonry Walls.
1. Steel Reinforcing Bars (vertical): Space and size reinforcing steel to support loads imposed.
2. Secure each successive length of reinforcing steel to previous length with bar positioners. Overlap length of successive reinforcing steel sufficiently to support loads without deflection. Comply with installation tolerances established by ACI Specifications.
3. Fully grout CMU cores containing reinforcing steel. Consolidate grout.

3.04 ACCESSORIES

A. General: Comply with ACI 530.1.

B. Anchors and Ties: Unless otherwise indicated, install within limits specified below.
1. Provide minimum of one anchor or tie for each 0.16 m2 (1.77 [4] square feet) of wall surface.
2. Maximum Distance between Adjacent Ties or Anchors:
    a. Vertically - 400 [600] mm (16 inches).
    b. Horizontally - 400 [600] [900] mm (16 inches).

C. Adjustable Veneer Anchors and Ties: Install anchors and ties in accordance with manufacturer's requirements.
1. Space at 400 mm (16 inch) OC maximum vertically and horizontally.
2. Adhere self-adhering tape to sheathing at each location to receive anchors and ties to establish gasket at fasteners.
3. Screw attach through tape and sheathing into metal studs and embed tie in midpoint of mortar joint.
4. Provide anchors in joints not greater than 300 mm (12 inches) from top of openings, bottom of openings, and top of wall spaced at 400 mm (16 inch) OC maximum.
5. Provide anchors secured to metal studs within 200 mm (8 inches) of wall terminations, openings, inside corners, and both sides of control joints; and within 250 mm (10 inches) of outside corners.
    a. Coordinate with Section 05 4100 to ensure proper location of studs for securing anchors.

D. Horizontal Joint Reinforcement Type 1 and Type 2:

1. Use horizontal joint reinforcement with adjustable ties where coursing does not align, cavity walls occur, or interior wythe is built ahead of exterior wythe.
2. Place reinforcement centered in interior and exterior masonry walls in every second bed joint (400 mm (16 inches) OC).
    a. Place reinforcement in first and second bed joints (200 mm (8 inches) OC) above and below openings in masonry walls and extend reinforcement at least 600 mm (24 inches) beyond each side of opening.
    b. Parapets and Screen Walls: Place reinforcement 200 mm (8 inches) OC.
3. Lap ends of reinforcement minimum of 150 mm (6 inches) at splices and cut and bend corners in accordance with manufacturer's instructions. Do not lap corners of reinforcement. Center reinforcement side rods over outside face shell of hollow units.
4. Do not extend horizontal joint reinforcement through control or expansion joints in masonry walls, unless specifically indicated otherwise.
5. Attach adjustable anchors to connectors and embed into mortar.

E. Self-Drill Adjustable Veneer Anchors and Ties: Install in accordance with manufacturer's requirements.
1. Space at 400 mm (16 inch) OC maximum vertically and horizontally.
2. Adhere self-adhering tape to sheathing at each location to receive anchors and ties to establish gasket at fasteners.
3. Screw attach through tape and sheathing into metal studs and embed tie in midpoint of mortar joint.
4. Predrill concrete and CMU.
5. Embed tie in midpoint of mortar joint.

F. Wire Mesh Ties: Install in every second bed joint (400 mm (16 inch) OC) where interior non-load-bearing walls intersect other interior non-load-bearing walls and bearing or non-load-bearing exterior walls, except where vertical control or expansion joint is indicated.
1. Extend minimum of 200 mm (8 inches) in longitudinal wall and to within 25 mm (1 inch) of outside face of intersecting wall.

G. Flexible Masonry to Steel Anchors: Secure masonry walls to structural steel with anchors specified.
1. Position anchors 400 mm (16 inches) OC vertically on columns.
2. Install anchors on beams where beam interrupts veneer back-up. On beams up to 400 mm [(16 inches)] deep, space anchors along center line of beam, 16 inches OC horizontally. On beams over 400 mm (16 inches) deep, space anchors 400 mm (16 inches) OC vertically and 400 mm (16 inches) OC horizontally.
3. Full weld all clips and rods, and install anchors in full bed of mortar.
4. Do not place in same course as horizontal joint reinforcement.

H. Dovetail Anchors and Slots: Furnish continuous vertical dovetail anchor slots to concrete trades for installation at 400 mm (16 inches) OC in concrete surfaces faced with masonry.
1. Install anchors in slots and full mortar bed at 400 mm (16 inches) OC vertically.

I. Weeps and Cavity Vents: Use plastic type cavity ventilators to provide weeps and cavity ventilation through head joints of each brick course immediately above flashings [and at top of wall below copings and shelf angles]. Do not dam bottom of vent with mortar.
1. Space 600 mm (24 inches) OC maximum.
2. Install cavity vents at top of cavity space at same spacing.
3. Keep weep head joints free from mortar.

J. Weeps (Wicks): Use cotton wick material to provide weep holes through head joints of each brick course immediately above flashings.
1. Length of wick to extend 25 mm (1 inch) beyond brick face and 100 mm (4 inches) into cavity.
2. Space weeps 400 mm (16 inches) OC maximum.
3. Keep rear portion of wick free from mortar.

4. Trim wicks to form uniform 6 mm (1/4 inch) protrusions.
5. Do not use wicks in CMU veneer walls.

3.05 MOVEMENT JOINTS

A. Horizontal Expansion Joints: Install joint filler in joint underneath shelf angles, beams, slabs, and decks and sealant tape as secondary seal behind primary joint sealant to establish weather barrier at face of assembly.
   1. Joint Sealant: See Section 07 9200.
   2. Locations: Install where indicated on Drawings. If joints are not indicated, install at each every other floor.

B. Vertical Control Joints:
   1. Exterior Brick and CMU Veneer Joints: Install joint fillers through veneer wythes.
   2. Other CMU Joints: Install CMU Control Joint Strip in slots in CMU Sash Units through CMU withes.
   3. Brick and CMU Joints in Composite and Cavity Walls: Coincide.
   4. Ensure joints are free from mortar and horizontal reinforcing.
   5. Utilize control joint filler to maintain width and depth of clear joint. Locate to permit proper placement of primary joint sealant and joint backer material sealant tape.
   6. Joint Sealant: See Section 07 9200.
   7. Locations: Install where indicated on Drawings and at building expansion joints. If joints are not indicated, install in accordance with following:
      a. At control or expansion joints in structure.
      b. At 9000 mm (30 feet) OC maximum horizontal run of uninterrupted wall and around corners.
      c. At 4500 mm (15 feet) OC maximum horizontal run for parapets, balconies, and free standing walls and at their junctions with walls of other building areas. Extend joints through masonry parapets and from top of parapet down to horizontal expansion joint.
      d. Within 3000 mm (10 feet) of inside and outside corners on one wall. Provide next vertical control joint around corner on other wall with distance between joints within maximum spacing requirements above.
      e. At offsets and setbacks in wall.
      f. At changes in thickness, height, or direction of wall.
      g. At openings greater than 600 mm (24 inches) wide. Provide for independent movement of loose lintels at vertical control joints by means of slip plane formed of masonry flashing and joint sealant in accordance with recommendations in BIA Technical Note 18A.
      h. Where more than one of above conditions occur in area, combine above requirements to minimize number of joints while creating continuous expansion control and visual appearance.
      i. Joint Width: As indicated on Drawings.

3.06 BUILT-IN WORK

A. General: As work progresses, build in metal frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built in work supplied by other sections.
   1. Build in items plumb and level to tolerances indicated.
   2. Frames: Bed anchors of frames in mortar joints. Fill hollow metal frame voids solid with mortar. Fill masonry cores with grout minimum 300 mm (12 inches) from framed openings and where items will be hung from or anchored to CMU.
   3. Do not build-in organic materials subject to deterioration.
   4. Leave 6 mm (1/4 inch) wide by 13 mm (1/2 inch) deep recessed joint for application of joint sealant and backer materials around built in items including door and window frames.

3.07 FIELD QUALITY CONTROL

A. General: Comply with Section 01 4529.

1. Verify that mortar and grout are properly mixed using specified proportions and ingredients.
2. Verify that construction details, procedures, and workmanship are in accordance with Contract Documents.
3. Verify placement of reinforcing steel, splices, and bar diameters are in accordance with Contract Documents.
4. Verify that ties, anchors, and accessories are properly located and installed.
5. Verify that materials are properly stored and prepared for use.

B. Perform field inspections under provisions of Section 01 4529 and with ACI 530.1, except as otherwise specified.
1. Verify that mortar and grout are properly mixed using specified proportions and ingredients.
2. Verify that construction details, procedures, and workmanship are in accordance with Contract Documents.
3. Verify placement of reinforcing steel, splices, and bar diameters are in accordance with Contract Documents.
4. Verify that ties, anchors, and accessories are properly located and installed.
5. Verify that materials are properly stored and prepared for use.

C. Mortar Tests:
1. Laboratory Compressive Strength Test: Comply with ASTM C780.
    a. Obtain samples during or immediately after discharge from batch mixer.
    b. Furnish molds with 50 mm (2 inch), 3-compartment gang cube.
    c. Test one sample at seven days and two samples at 28 days.
2. Owner will pay for tests unless test indicates mortar does not conform to Specification requirements, in which case, Owner will charge Contractor for tests.
3. One test during first week of operation; two tests per week after initial test until masonry completion.

D. Grout Tests
1. Laboratory Compressive Strength Test: Comply with ASTM C1019.
    a. Test one sample at seven days and two samples at 28 days.
2. Perform test for each 465 m2 (5000 SQ FT) of grouted collar joint masonry.
3. Owner will pay for tests unless test indicates grout does not conform to Specification requirements, in which case, Owner will charge Contractor for tests.

E. Prism Test Method: Perform prism tests to comply with ACI 530.1.
1. Test in accordance with ASTM E447, Method B; one set of prisms for seven day test and one set for 28 day test.
2. Owner will pay for tests unless test indicates compressive strength of masonry does not conform to Specification requirements, in which case, Owner will charge Contractor for tests.
3. One test during first week of operation; two tests per week after initial test until masonry completion.

F. Sealant Performance and Requirements: Section 07 9200.

3.08 ADJUSTING

A. Cut out and repoint defective mortar joints to match adjacent work.
1. During tooling of joints, enlarge voids and holes and completely fill with mortar matching adjacent.
2. Remove and replace masonry units which are loose, chipped, broken, stained, or otherwise damaged. Provide new units to match adjoining units and install in fresh mortar pointed to eliminate evidence of replacement.

3.09 CLEANING

A. General: Comply with Section 01 7400 and ACI 530.1. After mortar has set dry brush brick face to remove excess mortar, smears and stains prior to end of each work day.

B. Cleaning: Test cleaning products at field sample mock-up panel or other location as directed.
   1. Brick: BIA Tech Note 20; Recommended methods.
   2. Clean stained surfaces with non-acidic solution of type which will not harm masonry or adjacent materials. Follow manufacturer's instructions. Consult masonry manufacturer for acceptable cleaners.
   3. Do not allow cleaning solution to etch mortar joints, or adjacent surfaces such as masonry, metal, stone, concrete surfaces, foundations, or windows. Protect adjacent surfaces. Immediately remove cleaning products from adjacent surfaces when deposits occur.
   4. Cleaning tools: Non-metallic.

C. Clean-up debris and refuse created by masonry work and remove from site.
   1. Waste Management Procedures: Comply with Section 01 7419.

3.10 PROTECTION

A. Protect finished work in accordance with Section 01 7300.
   1. Prevent mortar from staining exposed brick and CMU faces.
   2. Protect sills, ledges, and projections from mortar droppings or other damage during construction.
   3. Maintain protective boards at exposed external corners, sills, ledges, and projections to avoid damage by construction activities.
   4. Wall Covers: Cover partially completed walls with impervious sheets when work is not in progress. Extend cover down 600 mm (24 inches) minimum on both sides of wall and secure in-place to prevent moisture infiltration and protect from weather.

B. Protection: Protect wall at scaffold work platform. Turn-up scaffold boards at end of day to reduce mortar stains on walls during wet weather.
   1. After completion of masonry work protect top of walls until wall cap [coping] and flashings are in place.

END OF SECTION

SECTION 051200 - STRUCTURAL STEEL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural steel framing members, columns, beams, purlins, bracing, support members, welds and fasteners.

B. Baseplates.

C. Column Anchors.

D. Grouting under baseplates.

1.02 RELATED REQUIREMENTS

A. Section 05 2100 - Steel Joists.

B. Section 05 3110 - Steel Roof Deck: Support framing for small openings in roof deck.

C. Section 05 3130 - Steel Floor Deck: Support framing for small openings in floor deck.

D. Section 05 5000 - Metal Fabrications: Non-framing fabrications affecting structural steel work.

E. Section 09 9000 - Painting: Finish painting.

1.03 REFERENCE STANDARDS

A. ASTM A36, A992 - Structural Steel.

B. ASTM A53 - Welded and Seamless Steel Pipe.

C. ASTM A325 - High Strength Bolts for Structural Steel Joints.

D. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

E. AWS D1.1 - Structural Welding Code.

F. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

G. AISC - Specification for Architectural Exposed Structural Steel.

H. SSPC - Steel Structures Painting Council.

I. AISI - American Iron and Steel Institute.

J. LGSI - Light Gage Steel Institute.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 3300.

B. Shop Drawings:

1. Indicate profiles, sizes, spacing, and locations of structural members, openings, attachments and fasteners.
2. Connections.
3. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Submit under provisions of Section 01 3300 certifying that products meet or exceed specified requirements.

D. Welders' Certificates: Submit under provisions of Section 01 3300 Manufacturer's Certificates, certifying welders employed on the Work, verifying AWS qualifications within the previous 12 months.

E. Products Furnished but Not Installed Under This Section:

1. Section 03 3000 - Cast-In-Place Concrete: Anchors for casting into concrete.
2. Section 04 3000 - Unit Masonry System: Anchors for embedding into masonry.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

B. Perform Work in accordance with AISC - Specification for Architectural Exposed Structural Steel.

C. Maintain one copy of document on site.

D. Qualifications:

1. Fabricator: Company specializing in performing the work of this Section with minimum ten (10) years documented experience.
2. Erector: Company specializing in performing the work of this Section with minimum five (5) years documented experience.

1.06 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on shop drawings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural Steel Members: ASTM A992, Channels and angles: ASTM A36.

B. Structural Tubing: ASTM A500, Grade B.

C. Pipe: ASTM A53, Grade B.

D. Bolts, Nuts, and Washers: ASTM A325 & AISC-98: primed after installation.

E. Anchor Bolts: ASTM A307.

F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days; manufactured by Independent Cement or Lehigh Valley.

H. Masonry Column Anchors: equal to Dur-O-Wall's D/A 710 mounted continuous to flange of column by welding in accordance with the manufacturer's recommendations. Coordinate with ties specified in Section 04 3000.

I. Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide.

J. Touch-up Primer for Galvanized Surfaces: Zinc rich type.

2.02 FABRICATION

A. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

2.03 FINISH

A. Prepare structural component surfaces in accordance with SSPC SP-2.

B. Shop prime structural steel members. Do not prime surfaces that will be in contact with concrete.

C. Provide Architectural grade finish for all structural steel exposed to view at the lobby and dining room. All welds shall be ground smooth with filler as required to provide a level, plumb, and uniform surface.

2.04 SOURCE QUALITY CONTROL AND TESTS

A. Testing and analysis of components will be performed under provisions of Section 01 4000.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Beginning of installation means erector accepts existing conditions.

3.02 ERECTION

A. Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

B. Field weld components indicated on Drawings.

C. Do not field cut or alter structural members without approval of Architect/Engineer.

D. After erection, clean, wire brush and prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

E. Contractor shall provide full, 100 percent grouting under baseplates.

3.03 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01 4000.

B. Provide inspections and reports in accordance with IBC 2006 - Table 1704.3.

END OF SECTION 051200

SECTION 061000 – ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

B. Keep all rough and finish lumbers a minimum of 6" off ground carefully covered and out of direct sunlight and precipitant weather. Allow air to flow freely through storage areas

1.3 SUMMARY

A. See Structural Drawings

PART 2 - PRODUCTS

2.1 STRUCTURAL WOOD PRODUCTS, GENERAL

A. Lumber: For built up beams and sistered rafter unless otherwise indicated on structural drawings use SPF or HEMFIR lumber. L

B. Lumber is to be free of large knots over 2", and fungus and molds of all types.

C. Lumber is to be less than 19% moisture content as measured by weight.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber. Do not use material that is warped or does not comply with requirements for untreated material.

B. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

C. Application: Treat items indicated on Drawings, and the following:

1. Wood framing members in Stable Level.

2.

2.3 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency.

B. Structural Framing: unless otherwise indicated on structural drawings Construction or No. 2 grade.

2.5 FASTENERS

A. General:

1. Where carpentry is exposed to weather, in ground contact, or in area of high relative humidity, unless otherwise indicated on structural drawings provide fasteners with hot-dip zinc coating complying with ASTM A 153 or Type 304 stainless steel.

2. Exposed fasteners in building interior shall have a surface appearance compatible with historical context of building. **No Phillips head fasteners may be used in exposed areas** unless otherwise indicated on structural drawings**.**

B. Wood Screws: Where exposed, flat head, straight slot sized appropriately for use unless otherwise indicated on structural drawings.

C. Lag Bolts: or use in Stable Level, unless otherwise indicated on structural drawings use hot dip galvanized sized appropriate for use.

D. Bolts: Steel bolts for use in Stable Level- unless otherwise indicated on structural drawings use hot dip galvanized sized appropriate for use, Grade A, with hex nuts and flat washers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers blocking and similar supports to comply with requirements for attaching other construction.

C. Apply AnchorSeal to all exposed end cuts and ends cuts on all wood materials in crawlspace or basement immediately prior to installation.

D. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.

E. Use fasteners of appropriate type and length. Predrill members when necessary to avoid splitting wood.

END OF SECTION 061000

SECTION 061200 - STRUCTURAL PANELS

PART 1 – GENERAL 1.01 SUMMARY

A. Section Includes: Structural Insulated Panels
B. Related Sections: Section(s) related to this section include:
1. Section 061000 Rough Carpentry
2. Section 072100 Building Insulation

1.02 SYSTEM DESCRIPTION
RAYCORE Structural Insulated Panels are component product stick framing module consisting of conventional 2x6 spf lumber studs prepositioned with polyurethane foam insulation molded in place between studs and foil radiant air barrier applied to the exterior sides of the panels.

RAYCORE Structural Insulated Panels are installed using conventional stick frame construction methods and practices per UCC, IBC, IRC and ICC standards. RAY-CORE Panels are to be combined with standard dimensional lumber studs, plates, nailers, headers and sills, as required, supplied onsite by contractor as detailed in manufacturer's installation details meeting all 2019 building codes.

1.03 REFERENCES

A. UCC – Universal Construction Code – Framing
B. IBC – International Building Code - Framing
C. IRC – International Residential Code - Framing
D. UL-723 – Foam Surface Burning Characteristics
E. ASTM E-72-05 - Compressive Load and Transverse Load
F. ASTM D 1622 - Foam Density
G. ASTM C 518 – Foam Initial K-Factor
H. ASTM D-2856 –Foam Closed Cell Content
I. ASTM D-2842 – Foam Water Absorption
J. ASTM D-2126 – Foam Dimensional Stability RAY-CORE Technical Data Sheet 20200915—

1.04 DESIGN REQUIREMENTS

A. Provide panels which have been manufactured to standard taking care to maintain performance criteria stated by manufacturer without defects, damage or failure. Provide labeling of all insulation used in the manufacture of panels. Manufacturer's listing programs shall cover both flame and physical properties.

B. Panel manufacturer will provide R-value documents for building owner acceptance and execution upon request. Manufacturer's standard forms will be submitted.

1.05 SUBMITTALS

A. Product Data: Submit product data for specified products
B. Installation Guide: Submit installation guide for specified products
C. Warranty: Warranty documents specified herein

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Installer should be experienced in performing work with a degree of experience equal to conventional wood framing construction and other conventional construction methods and practices similar to that required for this project.
B. Source Limitations: Obtain all panels through one source.

1.07 REGULATORY REQUIREMENTS

A. RAY-CORE Structural Insulated Panels shall be sized and installed in conformance and compliance with local codes.

1.08 DELIVERY, STORAGE & HANDLING

A. Prior to installation, RAY-CORE Structural Insulated Panels shall be stored in a protected area and elevated to prevent ground contact and covered to prevent exposure to sunlight, moisture and the elements.
B. Prior to installation, RAY-CORE Structural Insulated Panels shall be covered and protected from exposure to sunlight and moisture.
C. After installation, RAY-CORE Structural Insulated Panels shall be protected from prolonged exposure to sunlight and covered to prevent contact with water and /or moisture on all exposed panel edges and faces.

PART 2 - PRODUCTS

2.01 MANUFACTURERS/SUPPLIERS

A. RAY-CORE, INC., 305 E. Elva Street, Idaho Falls, ID 83401 2.02 MATERIALS

B. RAY-CORE Structural Insulated Panels are component building panel product using proprietary manufacturing method consisting of the following:

1. Integrated SPF #2 or better kiln dried or treated or engineered lumber
2. UL certified polyurethane foam – meeting manufacturer quality standards
3. Aluminum foil faced radiant vapor barrier with kraft substrate and direction reinforcing

2.03 FABRICATION

A. Sizes: RAY-CORE Structural Insulated Panels come in 4 foot widths and are available in standard spf lumber 2x6 thicknesses and standard lengths of 92.625”, 96”, 104.625”, 108, 120” and 144” based on stud configuration. See structural Drawings fro Required lengths.

2.04 PERFORMANCE CHARACTERISTICS

A. Thermal Resistance, R-value 38:
B. Panel Dimensional Tolerances: RAY-CORE Structural Insulated Panels shall comply with values listed in the manufacturer’s Quality Control Manual.
C. Structural Testing: Each RAY-CORE Structural Insulated Panel type shall meet or exceed performance standards, values, testing and applicable technical data reports when tested in accordance with:

1. ASTM E84 Surface burning characteristics for the rigid insulation core.
2. ASTM E84 Surface burning characteristics conducted for the interior and exterior surfaces of the finished panel.

PART 3 – EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Installation shall be in strict accordance with manufacturer's published instructions and conventional construction methods and practices, and compliance per local code requirements. Deviations from conventional building methods and practices should be calculated, signed and sealed by a registered professional engineer.

B. Certification: Builders plans and panel manufacturer's installation manual

3.02 EXAMINATION

A. Site Verification of Conditions: The contractor shall inspect conditions of substrate, grade and other conditions, which may affect the proper installation of panels. Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions. Any adverse conditions are to be reported in writing to the construction manager. Do not proceed with the installation until adverse conditions are corrected.

RAYCORE SIP PANELS TYPICAL R-VALUES PANEL THICKNESS (IN) ASTM C518 Standard Tested At 75° and F 55° F
5-1/2" 39 and 42

3.03 INSTALLATION: Installation shall be in strict accordance with manufacturer's published instructions and conventional construction methods and practices and compliance per local code requirements. Deviations from conventional construction methods and practices should be calculated, signed and sealed by a registered professional engineer.

A. Panel Supports: Provide level and square foundation/structural system/substrate to support wall and/or roof panels. Provide adequate bracing of panels during erection. Remove debris from panel edge prior to attachment of plates.

B. Panel Fastening: Connect panels to plates by construction adhesive, nails, staples or screws as required. Where screw fasteners are used, provide a minimum of 2" penetration into support. Join panels using plates. Apply adhesive and foam sealant to all joints, penetrations, cracks and voids to fill and seal, following manufacturer recommendations.

C. Tape: Provide tape at joints between panels and at intersection of roof and wall.

D. Thermal Barriers: Internal surfaces of panels shall be finished with a minimum 15-minute thermal barrier, such as ½ " gypsum wallboard other approved materials as required by local code requirements.

E. External Finishes: External surfaces of panels shall be finished with materials that provide protection from sunlight, weather, moisture and all elements.

F. Restrictions: Panels shall be protected from exposure to sunlight, moisture, the elements, solvents and their vapors, and any other substance that will damage the aluminum vapor barrier or polyurethane foam.

3.04 PROTECTION

A. When storing RAY-CORE Panels, panels shall be stored in a protected area and elevated to prevent ground contact and covered to prevent exposure to sunlight, moisture and the elements. Do not allow panels to be stored in an unsupported manner. Improper storage may cause materials damage or decomposition and tolerance problems in the field.

B. RAY-CORE Panels used on walls must be covered by an external finish to fully protect from sunlight, moisture and the elements.

C. RAY-CORE Panels used on roof must be fully protected from sunlight, moisture and the elements utilizing tarps, roofing materials or other means to provide temporary protection at the end of the day, or when rain or snow is imminent, and permanently upon completion of construction.

D. Remove and replace RAY-CORE panels, which have become excessively wet or damaged before proceeding with installation of additional panels or other work.

E. The construction manager, or his designee, shall remove all refuse created by the installation of work in this section.

F. Ordinary care and safety precautions should be followed when handling panels, as with other construction materials. Proper lifting techniques should be followed. Extra caution should be taken in wet, icy or windy conditions. Panel surface can be slippery. Exercise caution walking on panels and always use appropriate and approved fall protection. Do not walk on panels in wet, icy or windy conditions. Wear appropriate eye and dust protection when cutting panels.

SECTION 061340 - TIMBER FRAME RESTORATION AND REPAIR

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 RELATED SECTIONS

A. Division 01 Section 013591: Historic Treatment Procedures
B. Division 01 Section 012200: Unit Prices
C. Division 02 Section 024119: Selective Demolition

1.3 SUMMARY

A. Restoration: The wood framing and framing components are a character defining feature of the Claggett Barn. All efforts shall be committed to the retention, restoration and protection of the original wood members. The work of this section is to be undertaken only by craftsmen who are familiar with the repair techniques of heavy timber framing. The Owner will expect the Contractor to accept this policy of restoration and retention of the original materials. No framing members may be replaced unless clearly indicated as such on the Structural Drawings or until the Preservation Consultant and Architect review and approve each timber member proposed for replacement and grants written permission for each member to be replaced.

B. Related Sections

1. Division 1, Section 010000: General Conditions and Notes
2. Division 2, Section 024119: Selective Demolition
3. Division 6, Section 061000: Rough Carpentry
4. Division 6, Section 063010: Wood Treatment

1.4 HISTORIC BUILDING

A. Project work involves rehabilitation of a historically significant building. The building shall be treated respectfully. Existing conditions are to be carefully respected and no material, component or element shall be removed or disfigured unless specifically indicated on the Drawings, specified herein, or directed by the Historic Structure Consultant or Architect.

1.5 QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced, timber frame restoration firm to perform work of this Section. Any worker who is slated to do any work on the

frame reairs shall have completed work on buildings and materials similar in age, material, design, and extent to that indicated for this Project with a record of successful in-service performance. The firms being asked to provide bids have been selected because of their experience with similar structures. Individuals who will actually perform the work on the barn must also have a minimum of 5 years of successful completion of this type of work. Vitaes/resumes must be submitted for the firm and each worker who will work on the timber frame portions of the barn.

1. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisor (s) on Project site during times that timber frame restoration work is in progress. Supervisor(s) shall not be changed during Project except for causes beyond the control of restoration specialist firm.

2. Restoration Worker Qualifications: Provide persons who are experienced and specialize in restoration work of types they will be performing per above written Restoration Specialist Qualifications.

PART 2 - PRODUCTS

2.1 NEW TIMBER FRAME COMPONENTS

A. See structural drawings for notes on acceptable materials for timber frame replacement parts such as ne braces where missing.

2.2 NEW TIMBER FRAME REPAIR COMPONENTS

A. All patches are to match the wood species and grade and moisture content of the wood component to be repaired.

B. The exposed surfaces of the repairs are to match the sizes and profiles of the wood component to be repaired.

PART 3 - EXECUTION

3.1 Only workmen with experience in this work and with a record of successful completion of similar types of repairs may be assigned to complete repairs to the barn.

END SECTION 061340: TIMBER RESTORATION AND REPAIR

SECTION 062013 - EXTERIOR FINISH CARPENTRY

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 RELATED SECTIONS

A. Section 076100, Metal Roofing
B. Section 085550, Window and Vent Restoration
C. Section 099113, Exterior and Interior Painting

1.3 SUMMARY

A. This Section includes the following:

1. Exterior siding and trim
2. Wood fascias, soffits and rakes
3. Railings at East Forebay Doors

1.4 DEFINITIONS

A. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.
3. RIS: Redwood Inspection Service.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.5 SUBMITTALS

A. Samples for Initial Selection: For each type of siding and trim indicated.

B. Samples for Verification:

1. For each species and cut of lumber and panel products, with 1/2 of exposed surface finished; 50 sq. in. for lumber

C. Compliance Certificates:

1. For lumber that is not marked with grade stamp.
2. For preservative-treated wood that is not marked with treatment quality mark.

D. Warranties: Special warranties specified in this Section.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect materials against weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation within and around stacks and under temporary coverings.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.

1. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.
2. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.

B. Softwood Plywood: DOC PS 1.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process:

1. Lumber: AWPA C2. Kiln dry after treatment to a maximum moisture content of 19 percent.
2. Preservative Chemicals: Acceptable to authorities having jurisdiction **and containing no arsenic or chromium**.

3. For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.
4. Do not use material that is warped or does not comply with requirements for untreated material.
5. Mark lumber with treatment quality mark of an inspection agency approved by ALSC's Board of Review.

    a. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

6. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

    a. For exposed plywood indicated to receive a stained or natural finish, mark back of each piece.

2.3 STANDING AND RUNNING TRIM

A. Lumber Trim for Painted Finish:
1. Species and Grade: Yellow pine, cypress or white pine in that order, 1 common Maximum moisture content for seasoned or kiln-dried, board-size lumber varies depending on species, grade, and grading agency. See the Evaluations in Division 06 Section "Finish Carpentry."
2. Maximum Moisture Content: [15].
3. Finger Jointing: Not allowed]
4. Face Surface: smooth

B. Moldings for Painted Finish: .

1. Species: Hemlock, Yellow Pine, Cypress in that order, 1 common
2. Finger Jointing: Not allowed

2.4 LUMBER SIDING for New Addition

A. Provide kiln-dried lumber siding complying with DOC PS 20

B. Species and Grade: Hemlock, Yellow Pine, Cypress in that order, 1 common

C. Pattern: 1-1/8" thick. Band-sawn

D. Surface: Band-sawn exposed side, rough planned on back side to 1" thickness for even boards throughout.

2.5 Lumber Siding for Barn

A. Provide kiln-dried lumber siding complying with DOC PS 20

B. Species and Grade: Yellow pine, cypress or white pine in that order, 1 common

C. Pattern: 7/8" finish thickness, tongue and grooved, double beaded on exposed side, rough sawn on back side, skip planned on back side to even thickness

D. Surface: smooth on finished exterior side, can be left in the rough on the back side. Boards are to be planned to even thickness

2.6 RAILINGS (at East forebay Wagon Doors)

A. Railings: Clear, kiln-dried, solid, painted oak; railing stock of pattern indicated on A7.2.

B. Balusters: 1-1/4-inch- (27-mm-) square, clear, kiln-dried, solid painted oak.

C. Newel Posts: 3-1/2-inch- (70-mm-) square, clear, kiln-dried painted oak

2.7 MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 2 inches (38 mm) into wood substrate.

1. For face-fastening siding and battens, provide hot dipped galvanized spiral-shank siding nails.
2. For prefinished items, provide matching prefinished aluminum fasteners where face fastening is required.
3. For pressure-preservative-treated wood, provide hot-dip galvanized steel fasteners.
4. For applications not otherwise indicated, provide hot-dip galvanized steel.

B. Wood Glue: Waterproof resorcinol glue recommended by manufacturer for exterior carpentry use.

2.8 FABRICATION

A. Back out or kerf backs of standing and running trim wider than 5 inches (125 mm), except members with ends exposed in finished work.

B. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

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

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Prime lumber to be painted, including both faces and edges. Cut to required lengths and prime ends. Comply with requirements in Division 09 Section "Exterior Painting."

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

1. Do not use manufactured units with defective surfaces, sizes, or patterns.

B. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
3. Coordinate exterior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install flat grain lumber with bark side exposed to weather.

Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long except where necessary.

1. Use scarf joints for end-to-end joints.
2. Stagger end joints in adjacent and related members.

B. Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

C. Unless otherwise indicated, countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.

3.5 SIDING INSTALLATION

A. Install as per Drawing A5.3 and Structural Drawings.

3.6 ADJUSTING

A. Replace exterior finish carpentry that is damaged or does not comply with requirements. Exterior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.7 CLEANING

A. Clean exterior finish carpentry on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.8 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062013

SECTION 07 21 13
THERMAL INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Section Includes:
   1. Thermal insulation.
      a. Rigid Foam Insulation at exterior walls.
   2. Acoustical insulation.
      a. Batt and blanket insulation at interior framed partitions and ceilings.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 Rough Carpentry
B. Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS adhesives VOC Limits

1.3 SUBMITTALS:

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
B. Submittal Drawings:
   1. Show insulation type, thickness, and R-value for each location.
C. Manufacturer's Literature and Data:
   1. Description of each product.
   2. Adhesive indicating manufacturer recommendation for each application.
D. Sustainable Construction Submittals:
   1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.
   2. Low Pollutant-Emitting Materials:
      a. Show volatile organic compound types and quantities.

1.4 DELIVERY

E. Deliver products in manufacturer's original sealed packaging.
F. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.

G. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.5 STORAGE AND HANDLING

H. Store products indoors in dry, weathertight facility.

I. Protect products from damage during handling and construction operations.

J. Protect foam plastic insulation from UV exposure

1.6 APPLICABLE PUBLICATIONS:

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

1. C516-08(2013)e1 - Vermiculite Loose Fill Thermal Insulation.
2. C549-06(2012) - Perlite Loose Fill Insulation.
3. C552-15 - Cellular Glass Thermal Insulation.
4. C553-13 - Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
5. C578-15 - Rigid, Cellular Polystyrene Thermal Insulation.
6. C591-15 - Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
7. C612-14 - Mineral Fiber Block and Board Thermal Insulation.
8. C665-12 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
9. C728-15 - Perlite Thermal Insulation Board.
10. C954-15 - Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Base to Steel Studs From 0.033 (0.84 mm) inch to 0.112 inch (2.84 mm) in thickness.
11. C1002-14 - Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
12. D312/D312M-15 - Asphalt Used in Roofing.
13. E84-15a - Surface Burning Characteristics of Building Materials.

14. F1667-15 - Driven Fasteners: Nails, Spikes, and Staples.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing urethane foam products and systems of this section with minimum ten years documented experience.

B. Installer Qualifications: Installer must be certified by SWD Urethane to install SWD urethane insulation systems.

C. Pre Installation Conference: Convene a pre-installation conference to review installation procedures with the COTR.

1.2 WARRANTY

A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 INSULATION – GENERAL:

A. Insulation Thickness:
   1. Provide thickness required by R-value shown on drawings.
   2. Provide thickness indicated when R-value is not shown on drawings.

B. Insulation Types:
   1. Provide one insulation type for each application.

C. Sustainable Construction Requirements:
   1. Insulation Recycled Content:
      a. Polyisocyanurate/polyurethane rigid foam: 9 percent recovered material.
      b. Polyisocyanurate/polyurethane foam-in-place: 5 percent recovered material.
      c. Glass fiber reinforced: 6 percent recovered material.
      d. Phenolic rigid foam: 5 percent recovered material.
      e. Rock wool material: 75 percent recovered material.
   2. Low Pollutant-Emitting Materials: Comply with VOC limits specified in Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS for the following products:

a. Non-Flooring Adhesives and Sealants.

2.2 LOOSE FILL ATTIC BLOW-IN INSULATION OR HIGH DENSITY BLANKETS

A. section deleted

2.3 EXTERIOR ROOF FRAMING INSULATION (AT ADDITION ONLY)

A. Closed Cell Spray Foam Insulation: two-component, closed cell polyurethane foams with a nominal density of 2.0 pcf, shall have the following minimum physical properties when cured :
1. Core Density: 2.0 lbs/ft3 when tested in accordance with ÅSTM D 1622.
2. Compressive Strength: 25 psi when tested in accordance with ÅSTM D 1621.
3. R-Value (aged): When tested in accordance with ÅSTM C 518:
   a. 6.0 at 1 inch.
   b. 23 at 3.5 inches.
   c. 36.2 at 5.5 inches
4. Closed Cell Content: Greater than 90 percent when tested in accordance with ÅSTM D 2856.
5. Surface Burning Characteristics: Less than 25 when tested in accordance with ÅSTM E 84 and SDI less than 450 when tested in ÅSTM E 84.
6. Tensile Strength: 60 psi when tested in accordance with ÅSTM D 1623.
7. Moisture Vapor Transmission (permeance) when tested in accordance with ASTM E 96. 1.0 Perms at 1.47 inch.
8. Dimensional Stability: (7 days at 158 degrees F, 95 percent RH) less than 10 percent change in volume when tested in accordance with ASTM D 2126.
9. Air Leakage Rate: Less than 0.02 (L/s)/m2 when tested in accordance with ASTM E 283.

B. Insulation materials shall be ICC approved spray closed cell polyurethane wall foam insulation.

C. Insulation materials shall be Greenguard approved.

D. Insulation materials shall meet revised AC377, approval criteria.

E. Closed cell foam may be installed in attics to the underside of roof sheathing or roof rafters and in crawl spaces with insulation on the underside of top spaces to a maximum thickness of 9.5 inches and to a maximum thickness of 5.5 inches for vertical surfaces.

F. Exposed foam shall require intumescent coatings in attic.

G. Insulation materials shall meet AC377 thermal barrier standards with the

2.4 COATINGS:

A. Intumescent coating for spray foam insulation in attic and crawlspace applications, manufactured for use as an ignition barrier.

2.5 ACOUSTICAL INSULATION:

A. Mineral Fiber Batt or Blankets: ASTM C665. Maximum flame spread of 25 and smoke development of 450 when tested in accordance with ASTM E84.

D. Thickness as shown; of widths and lengths to fit tight against framing.

2.6 SOUND DEADENING BOARD:

A. Section Deleted

2.7 RIGID INSULATION:

A. Owens Corning® FOAMULAR® & FOAMULAR® NGX™ 250 ExtrudedP olystyrene (XPS) Insulation are closed-cell, moisture-resistant rigid foam boards

2.8 FASTENERS:

A. Staples or Nails: ASTM F1667, zinc-coated, size and type best suited for purpose.

B. Screws: ASTM C954 or C1002, size and length best suited for purpose with washer not less than 50 mm (two inches) in diameter.

C. Impaling Pins: Steel pins with head not less than 50 mm (two inches) in diameter with adhesive for anchorage to substrate. Provide impaling pins of length to extend beyond insulation and retain cap washer when washer is placed on the pin.

2.9 ADHESIVE:

A. Non-flammable type recommended by the manufacturer of the insulation.

2.10 TAPE:

A. Pressure sensitive adhesive on one face.

PART 3 - EXECUTION

3.1 ACOUSTICAL BATT INSTALLATION - GENERAL

A. General:

1. Install insulation without voids.
2. Pack insulation around door frames and windows, in building expansion joints, door soffits, and other voids.
3. Pack behind outlets, around pipes, ducts, and services encased in walls.
4. Hold insulation in place with pressure sensitive tape.

5. Lap facer flanges together over framing for continuous surface. Seal all penetrations through the insulation and facers.
6. Do not compress insulation below required thickness except where embedded items prevent required thickness.

B. Semi Rigid, Batts and Blankets:
   1. Semi Rigid Batts and Blankets:
      a. When insulation is not full thickness of cavity, adhere insulation to one side of cavity, maintaining continuity of insulation and covering penetrations or embedments.
      b. Wood Framing:
         1) Fasten blanket insulation as per manufacturer's instructions.

3.2 EXTERIOR FRAMING AND ATTIC INSULATION:

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not apply the polyurethane foam when substrate or ambient air temperatures are above or below the acceptable temperatures identified by the manufacturer on the product data sheets.

C. Ensure that the project site is sealed off and ventilated properly per the safety standards set forth by the American Chemistry Council, and by SWD Urethane. In addition during installation, create negative pressure with fans and plastic sheeting to vent the fumes towards the East and West ends of the building to avoid fumes entering main corridor.

3.3 ACOUSTICAL INSULATION:

A. Fasten blanket insulation between studs and wall furring with continuous pressure sensitive tape along edges or adhesive.
B. Pack insulation around door frames and windows and in cracks, expansion joints, control joints, door soffits and other voids. Pack behind outlets, around pipes, ducts, and services encased in wall or partition. Hold insulation in place with pressure sensitive tape or adhesive.
C. Do not compress insulation below required thickness except where embedded items prevent required thickness.

D. Where semirigid insulation is used which is not full thickness of cavity, adhere to one side of cavity maintaining continuity of insulation and covering penetrations or embedments in insulation.

3.8 CLEANING

A. Remove excess adhesive before adhesive sets.

3.9 PROTECTION

A. Protect insulation from construction operations.

B. Repair damage.

- - - E N D - - -

SECTION 07620 - Flashing, Sheet Metal & Trim

Part 1 - General

1.01 Description

A. Work of this Section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Roof Flashings (reglet and counterflashing)
2. Shop-Formed Roof Vents
3. Downspouts
4. Flashing above doors and windows

B. Related Work Specified Elsewhere

1. Metal Roofing & Accessories: Section 07610

1.02 REFERENCES

A. Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
B. American Society for Testing and Materials (ASTM).
C. Federal Specifications (FS).

1.03 SUBMITTALS

A. Shop Drawings - Show the manner of forming, jointing, and securing the metal flashings and trim. Include expansion joint connections, and the method of forming waterproof connections to adjoining construction.

B. Product Data - Catalog sheets, specifications, installation instructions for each item specified except for shop or job formed items, solder, flux, and bituminous coating.

C. Samples

1. Materials for Flashings: one 6" sq. piece, for each type material specified.

2. Anchors: Six, each type required.

3. Cap Flashings: Full section, 6" long.

4. Gutter: Full section, 12" long.

5. Rolling Barn Door Hardware Z flashing: 6" long

1.04 QUALITY ASSURANCE

A. Except as otherwise shown or specified, comply with applicable recommendations, details, and standards of CDA, and SMACNA.

B. All metal Work shall be ink-stamped at intervals, identifying Manufacturer, type metal, and gage or thickness.

C. Manufacturer's Recommendations
For factory fabricated items, follow the manufacturer's recommendations and installation instructions unless specifically shown or specified otherwise.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products of this Section in such manner to protect them from damage.

B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation and replace with acceptable materials.

C. Deliver in as long lengths as practical, which will result in as few joints as possible.

1.06 PROJECT CONDITIONS

A. Do not execute the Work of this Section unless the Owner's Representative is present, unless otherwise directed.

B. Make the roof and all uncompleted flashings watertight at the end of each work day.

C. Clean and dry all splicing and bonding surfaces.

D. Coordinate work of this Section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of the work and protection of materials and finishes.

1.07 GUARANTEE

A. The Contractor shall provide a two (2) year written guarantee, covering the flashing and sheet metal materials and workmanship. Should any defects occur during the stated period, they shall be corrected immediately, and all damage caused by such defects shall be corrected; all corrective Work shall be at the Contractor's expense.

Part 2 - Products

2.01 MATERIALS FOR FLASHING FABRICATION

B. Through Wall Flexible Flashing (See 2.04)

C. Rake Flashing: Galvanized aluminum (26 gauge)

2.02 FASTENERS

A. Nails "Stronghold" type large flat head roofing nail: Stainless steel.

B. Screws, Bolts, and other Fastening Accessories: Stainless steel.

2.03 MISCELLANEOUS MATERIALS

A. Solder: Composition of block tin/pig lead of properties recommended by the metal manufacturer, stamped either 50/50 or 60/40 "Warranted".

B. Flux: Paste or acid type as recommended by the metal manufacturer.

C. Bituminous Coating (for separating dissimilar metals): FS TT-C494.

D. Type 3 Sealant (For concealed sealant joints of through wall cap receivers and other areas which require concealed sealant). One part butyl rubber sealant; Pecora BC-158, PTI 707, or Woodmont chem-Calk 300.

2.04 FABRICATION

A. Where practicable, form and fabricate sheet metal work in the factory or shop. Produce bends and profiles accurately to the indicated shapes. Where not indicated or specified, follow the applicable requirements of the reference standards listed in PART 1.

B. Reglet and counterflashing

1. Extruded aluminum reglet and roll formed counterflashing units with Finish to match roof color.

2. Provide MM System RC-3 for masonry, or approved equals.

C. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer's instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

E. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.

F. Separations: Provide for separation of metal from incompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

G. Other Materials: No asphalt roofing cements, coatings, asbestos impregnated asphalt compounds or other patching materials shall be used as joint adhesive, sealant, or caulking for cover flashing, sheet metal,or adjacent surfaces unless approved in writing by the Architect.

Part 3 - Execution

3.01 EXAMINATION

A. Coordinate the work of this Section with other Work for the correct sequencing of items which make up the entire, system of weatherproofing or waterproofing.

B. Verify all dimensions at site. Bring field dimensions which are at variance to the attention of the Architect. Obtain a decision regarding corrective measures before starting work.

3.02 PREPARATION

A. Do not install the Work of this Section unless all necessary nailers, blocking and other supporting components have been provided.

B. Do not install the Work of this Section unless all substrates are clean and dry.

C. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place, providing for thermal expansion of metal units; conceal fasteners where possible; set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

3.03 INSTALLATION

A. Isolation

Separate dissimilar metals from each other with bituminous coating.

B. Tinning and Soldering

1. Use soldering irons (heavy coppers) as Industry Standard. Torch soldering is not acceptable.

2. Clean, flux and tin all surfaces to be soldered.

3. Sweat solder thoroughly into seams, completely filling the seam for the full width.

4. Upon completion of soldering, remove all traces of flux residue, and if required, apply a neutralizing wash followed by a clean water wash.

C. Gutters and Downspouts

1. Factory Form cornice sheet metal as indicated on drawings.

2. Solder all construction joints.

3. Provide expansion joints as recommended by SMACNA.

4. Conceal all fasteners and make all connections water tight.

D. Rolling Barn door hardware Z Flashing

1. Provide double hemmed Z shaped flashing to cover rolling door track

3.04 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

B. Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion. Work which does become damaged in any way or is not watertight shall be repaired and/or replaced as directed to the satisfaction of the Architect at no additional cost to the Owner.

END OF SECTION 07620

SECTION 07900 - Sealants

PART 1 - GENERAL

1.01 Description

A. Work of this Section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Work Includes: Sealant wherever indicated on the drawings or required for a watertight or visually complete job.

2. Provide dense compressible UV resistant foam (neoprene) at all exterior vertical joints between dissimilar materials.

B. Related Work Specified Elsewhere

1. Rough Carpentry: Section 06100
2. Finish Hardware: Section 08700
3. Painting: Section 09900

1.02 SUBMITTALS

A. Submit three (3) each of the following to Architect for review prior to delivery and installation:

1. Cured sealants and color charts.
2. Filler and backer rods - 6" long - each type and kind.
3. Guarantee.
4. Manufacturers' literature and data sheets.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver sealants, primers, fillers and backup to the job site in sealed containers and packages bearing the manufacturer's label shall indicate date of manufacturer of each sealant, and the sealant shall not be used beyond the recommended shelf life.

B. Store and handle materials, prior to installation, in a manner recommended by the manufacturer.

C. Remove broken and damaged containers from the site. Sealants in damaged containers will not be permitted to be used on the Project.

1.04 JOB CONDITIONS

A. Examine the joint surfaces and backing, and their anchorage to the structure, and the conditions under which the sealant work is to be performed, and do not proceed with the sealant work until unsatisfactory conditions have been corrected in an acceptable manner.

1.05 GUARANTEE

A. Provide a written, notarized guarantee from the manufacturer and the applicator stating that the applied sealants shall remain watertight for a period of two (2) years.

B. Guarantee shall be in a form acceptable to the Architect and/or the Owner and executed by an authorized individual.

C. Include in the guaranteed a provision to repair and/or replace at Contractor's expense, sealant defects which develop during guarantee period, because of faulty labor and/or materials.

1.06 PROTECTION

A. Protect all surfaces adjacent to sealants with tape or other. approved covering. Remove tape immediately after joints have been sealed and tooled.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Colors: For exposed materials provide color as indicated or, if not indicated, as selected by Architect from standard color lines.

B. Hardness: As recommended by manufacturer for type of application indicated.

C. Modulus of Elasticity: Provide the lowest available modulus of elasticity which is consistent with exposure to weathering, indentation, abrasion and support of loading.

D. Compatibility: Before purchases of each required material, confirm its compatibility with each other material it will be exposed to or come in contact with in the joint system.

E. Size and Shape: As recommended by the material manufacturer for the type and condition of joint, and for the required joint performance and movement. Obtain approval of each joint profile before proceeding.

F. Grade of Sealant: For each application, provide the grade of sealant (non-sag, self-leveling, no-track, knife grade, performed, etc.) as recommended by the manufacturer for the particular condition of installation (location, joint shape, ambient

temperature and similar conditions) to achieve the best possible overall performance. Grades specified herein are for normal condition of installation.

2.02 ELASTOMERIC SEALANTS

A. Polyurethane 4 sealant: Two part elastomeric complying with FS TT-S-00227, Class A Type 2 (gun grade) and ASTM C-920. Colors as selected by Architect.

1. Location: exterior building joints vertical and horizontal not subject to vehicular or pedestrian traffic.

2. Acceptable manufacturers:

a. Tremco Inc.
b. Mameco
c. Toch/Carboline
d. Or an acceptable equal.

B. Two-component Polyurethane Sealant: Polyurethane-based 2-part elastomeric sealant, complying with FS TT-S-00227E Class A, Type 1 (self-leveling) unless Type 2 recommended by manufacturer for the application shown, and ASTM C-920. Colors selected by the Architect.

1. Locations: exterior, subject to vehicular or pedestrian traffic.

2. Acceptable manufacturers

a. Tremco Inc.
b. Mameco
c. Toch/Carboline
d. Or an approved equal

C. Sealant and backing for joints at floor penetrations and penetrations through interior fire rated construction: Tremco Fire Resistive Joint System using Tremco,"Mono" sealant and Tremco "Cerablanket-FS".

2.03 NON-ELASTOMERIC SEALANTS

A. One-component acrylic base sealant: Acrylic terpolymer, solvent based, one part, thermoplastic sealant compound, solids not less than 95 percent acrylic; complying with FS TT-S-00230, Class 8, Type II, paintable, non-staining.

1. Locations: Exposed interior locations.

B. Butyl rubber sealant: Polymerized butyl rubber and inert fillers (pigments), solvent-based with minimum 75 percent solids, non-sag consistency, tack-free time of 24 hours or less.

1. Locations: Concealed interior locations.

2.04 SANITARY SEALANT

A. Silicone rubber based sealant, one part, mildew resistant, nonnutrient surface conforming to FS TT-S-001543 and ANSI A136.1 Section 6.4.

1. Locations: Wet locations where sealants are noted.

2. Acceptable manufacturers
   a. General Electric No. 1700
   b. Or an equal acceptable to the Architect.

2.05 PREFORMED SEALANT

A. Polyethylene foam impregnated with bitumen, density 8 lb. pcf, elongation 190 percent, 15 lb. tensile strength.

1. Locations: secondary sealant behind backer rods of exposed sealant where noted on the drawings. (expansion joints).

2. Acceptable manufacturer:
   a. Emseal USA., Stamford, CT.
   b. Or an acceptable equal

2.06 JOINT FILLERS

A. Preformed, non-extruding joint filler: Provide resilient and non-extruding type premolded cork units complying with ASTM D 1752, Type II; FS HH-F-341, Type II, Class B; and AASHO M153, Type II.

1. Locations: Backing for two-component, polyurethane sealants at vehicular and pedestrian traffic.

B. Sealant Backer Rod: Compressible rod stock of polyethylene foam unless other flexible, permanent, durable non-absorptive material is recommended by sealant manufacturer, and approved by Architect, for compatibility with sealant used, and shall form no bond with the sealant.

1. Locations: All locations except where silicone sealant is used, unless otherwise recommended by sealant manufacturer in writing.

C. Bond breaker tape: Polyethylene tape or other plastic tape as recommended by the sealant manufacturer to be applied to sealant-contact surfaces where bond to the substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape as required.

2.07 JOINT PRIMER/SEALER

A. Joint Primer/Sealer: Provide,the type of joint primer/sealer recommended by the sealant manufacturer for the joint surfaces to be primed or sealed. Non-staining type.

2.08 MIXING

A. Mix sealant, in strict accordance with sealant manufacturers instructions, by workmen skilled in this type of work. Mix as recommended by the manufacturer, for two part materials.

2.09 MISCELLANEOUS MATERIALS

A. Cleaning Solvents: Oil free solvents as recommended in writing by the sealant manufacturer. Do not use re-claimed solvents.

B. Masking Tape: Removal paper,or fiber tape, self-adhesive, nonstaining.

PART 3 - EXECUTION

3.01 INSPECTION AND WORKMANSHIP

A. Examine surfaces to which the work is to be applied and notify the Architect if conditions exist which are detrimental to the proper and expeditious installation of the work. Starting of work shall imply acceptance of surfaces to perform work as specified herein.

B. Joints shall be clean, free of release agents, curing compounds, loose aggregate, and shall be free of dust.

C. Joints shall not be less than 1/2" depth by 1/4" width. For joints in non-porous surfaces such as metal and glass, sealant depth shall be a minimum of 1/2 sealant width and shall in no case exceed width of sealant. Depth of sealant may be equal to width of joints up to 1/2" wide. For expansion and other joints exceeding 1/2" joint width, depth of joint is defined as distance from outside face of joint to closest point filler, whether joint filler is rod shape 'or rectangular.

3.02 PREPARATION

A. Joints to be sealed and caulked shall be thoroughly cleaned of mortar or foreign materials in an approved manner before sealing and caulking materials are applied. Remove coating from metal surfaces by.use of solvent recommended by manufacturer of metal.

B. The use of primers and other preparatory treatments shall be as recommended by the sealant manufacturer for the encountered substrates. If the primer used will

produce discoloration or dirt pickup, when applied on porous substrates, then protect surfaces adjacent to joint from such contamination by use of masking tape.

3.03 INSTALLATION

A. Use primer as it comes from the can, unadulterated, and apply as per the approved manufacturer's printed directions, and/or recommendations. Prime joints before insertion of joint back-up material.

B. When installing rod stock filler, roll filler into joints so that rod filler in its final position will not be twisted.

C. Apply sealants within "pot life" recommended by the manufacturer for prevailing temperature and humidity-conditions.

D. Apply vertical sealants from gun devices and horizontal traffic bearing sealants gun or pour grade. Tool joints using approved tools to concave profiles assuring uniform and continuous bonding to the back-up material. Complete work shall be uniform in appearance without voids, tears or other imperfections.

E. Install preformed sealant in strict accordance with the recommendations of the approved manufacturer. Use material two times joint width. Install behind backer rod of exposed sealant in continuous length with scarf joints at abutting ends.

3.04 SEALANT TESTS

A. Install two (2). foot lengths of primed and unprimed sealed joints between all combinations of substrate to be sealed. Wait three days before performing pull tests in the presence of the Architect.

3.05 PROTECTION AND CLEANING

A. Protect exposed surfaces, adjacent to joints, to prevent permanent staining and/or damage to adjacent work.

B. Immediately after application of sealants, clean adjacent surfaces, which may have become soiled. Method and materials it makes contact with.

C. Joints which are not properly sealed, show evidence of lack of adhesion or other defects, as determined by the Architect, shall be cut out and re-caulked at no additional cost to Owner.

END OF SECTION 07900

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies steel doors, steel frames and related components.

B. Terms relating to steel doors and frames as defined in ANSI A123.1 and as specified.

1.2 RELATED WORK

A. Frames fabricated of structural steel: Section 05 40 00, COLD FORMED METAL FRAMING.

B. Door Hardware: Section 08 71 00, DOOR HARDWARE.

C. Glazing: Section 08 80 00, GLAZING.

1.3 TESTING

An independent testing laboratory shall perform testing.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturers Literature and Data:

1. Fire rated doors and frames, showing conformance with NFPA 80 and Underwriters Laboratory, Inc., or Intertek Testing Services or Factory Mutual fire rating requirements .

1.5 SHIPMENT

A. Prior to shipment label each door and frame to show location, size, door swing and other pertinent information.

B. Fasten temporary steel spreaders across the bottom of each door frame.

1.6 STORAGE AND HANDLING

A. Store doors and frames at the site under cover.

B. Protect from rust and damage during storage and erection until completion.

1.7 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

B. Federal Specifications (Fed. Spec.):

L-S-125B ..... Screening, Insect, Nonmetallic

C. Door and Hardware Institute (DHI):

A115 Series ..... Steel Door and Frame Preparation for Hardware, Series A115.1 through A115.17 (Dates Vary)

D. Steel Door Institute (SDI):

113-01 ..... Thermal Transmittance of Steel Door and Frame Assemblies

128-1997 ..... Acoustical Performance for Steel Door and Frame Assemblies

A250.8-03 ..... Standard Steel Doors and Frames

E. American Society for Testing and Materials (ASTM):

A167-99(R2004)	Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
A568/568-M-07	Steel, Sheet, Carbon, and High-Strength, Low-alloy, Hot-Rolled and Cold-Rolled
A1008-08	Steel, sheet, Cold-Rolled, Carbon, Structural, High Strength Low Alloy and High Strength Low Alloy with Improved Formability
B209/209M-07	Aluminum and Aluminum-Alloy Sheet and Plate
B221/221M-08	Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
D1621-04	Compressive Properties of Rigid Cellular Plastics
D3656-07	Insect Screening and Louver Cloth Woven from Vinyl Coated Glass Yarns
E90-04	Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

F. The National Association Architectural Metal Manufactures (NAAMM):
Metal Finishes Manual (1988 Edition)

G. National Fire Protection Association (NFPA):
80-09 ..... Fire Doors and Fire Windows

H. Underwriters Laboratories, Inc. (UL):
Fire Resistance Directory

I. Intertek Testing Services (ITS):
Certifications Listings…Latest Edition

J. Factory Mutual System (FM):
Approval Guide

PART 2 - PRODUCTS .

2.1 MATERIALS

A. Sheet Steel: ASTM A1008, cold-rolled for panels (face sheets) of doors.

B. Anchors, Fastenings and Accessories: Fastenings anchors, clips connecting members and sleeves from zinc coated steel.

C. Aluminum Sheet: ASTM B209/209M.

D. Aluminum, Extruded: ASTM B221/221M.

G. Prime Paint: Paint that meets or exceeds the requirements of A250.8.

2.2 FABRICATION GENERAL

A. GENERAL:

1. Follow SDI A250.8 for fabrication of standard steel doors, except as specified otherwise. Doors to receive hardware specified in Section 08 71 00, DOOR HARDWARE. Tolerances as per SDI A250.8. Thickness, 44 mm (1-3/4 inches), unless otherwise shown.
2. Close top edge of exterior doors flush and seal to prevent water intrusion.
3. When vertical steel stiffeners are used for core construction, fill spaces between stiffeners with mineral fiber insulation.

B. Fire Rated Doors (Labeled):
1. Conform to NFPA 80 when tested by Underwriters Laboratories, Inc., Inchcape Testing Services, or Factory Mutual for the class of door or door opening shown.
2. Fire rated labels of metal, with raised or incised markings of approving laboratory shall be permanently attached to doors.
3. Close top and vertical edges of doors flush. Vertical edges shall be seamless.

2.3 METAL FRAMES

A. General:
1. SDI A250.8, 1.3 mm (0.053 inch) thick sheet steel, types and styles as shown or scheduled.
2. Frames for exterior doors: Fabricate from 1.7 mm (0.067 inch) thick galvanized steel conforming to ASTM A525.
3. Frames for labeled fire rated doors .
   a. Comply with NFPA 80. Test by Underwriters Laboratories, Inc., Inchcape Testing Services, or Factory Mutual.
   b. Fire rated labels of approving laboratory permanently attached to frames as evidence of conformance with these requirements. Provide labels of metal or engraved stamp, with raised or incised markings.
4. Knocked-down frames are not acceptable.

B. Reinforcement and Covers:
1. SDI A250.8 for, minimum thickness of steel reinforcement welded to back of frames.
2. Provide mortar guards securely fastened to back of hardware reinforcements except on lead-lined frames.

C. Terminated Stops: SDI A250.8.

D. Glazed Openings and Panel Opening:
a. Integral stop on exterior, corridor, or secure side of door.
b. Design rabbet width and depth to receive glazing material or panel shown or specified.

E. Two piece frames:
a. One piece unequal leg finished rough buck sub-frames as shown, drilled for anchor bolts.
b. Unequal leg finished frames formed to fit subframes and secured to subframe legs with countersunk, flat head screws, spaced 300 mm (12 inches) on center at head and jambs on each side.

c. Preassemble at factory for alignment.

F. Frame Anchors:

1. Floor anchors:
   a. Where floor fills occur, provide extension type floor anchors to compensate for depth of fill.
   b. At bottom of jamb use 1.3 mm (0.053 inch) thick steel clip angles welded to jamb and drilled to receive two 6 mm (1/4 inch) floor bolts. Use 50 mm x 50 mm (2 inch by 2 inch) 9 mm by (3/8 inch) clip angle for lead lined frames, drilled for 9 mm (3/8 inch) floor bolts.
   c. Where mullions occur, provide 2.3 mm (0.093 inch) thick steel channel anchors, drilled for two 6 mm (1/4 inch) floor bolts and frame anchor screws.
   d. Where sill sections occur, provide continuous 1 mm (0.042 inch) thick steel rough bucks drilled for 6 mm (1/4 inch) floor bolts and frame anchor screws. Space floor bolts at 50 mm (24 inches) on center.
2. Jamb anchors:
   a. Locate anchors on jambs near top and bottom of each frame, and at intermediate points not over 600 mm (24 inches) apart except for fire rated frames space anchors as required by labeling authority.
   b. Form jamb anchors of not less than 1 mm (0.042 inch) thick steel unless otherwise specified.
   c. Anchors set in masonry: Use adjustable anchors designed for friction fit against the frame and for extension into the masonry not less than 250 mm (10 inches). Use one of following type:
      1) Wire loop type of 5 mm (3/16 inch) diameter wire.
      2) T-shape or strap and stirrup type of corrugated or perforated sheet steel.
   d. Anchors for stud partitions: Either weld to frame or use lock-in snap-in type. Provide tabs for securing anchor to the sides of the studs.
   e. Anchors for frames set in prepared openings:
      1) Steel pipe spacers with 6 mm (1/4 inch) inside diameter welded to plate reinforcing at jamb stops or hat shaped formed strap spacers, 50 mm (2 inches) wide, welded to jamb near stop.
      2) Drill jamb stop and strap spacers for 6 mm (1/4 inch) flat head bolts to pass thru frame and spacers.
      3) Two piece frames: Subframe or rough buck drilled for 6 mm (1/4 inch) bolts.
   f. Anchors for observation windows and other continuous frames set in stud partitions.
      1) In addition to jamb anchors, weld clip anchors to sills and heads of continuous frames over 1200 mm (4 feet) long.
      2) Anchors spaced 600 mm (24 inches) on centers maximum.

g. Modify frame anchors to fit special frame and wall construction and provide special anchors where shown or required.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Plumb, align and brace frames securely until permanent anchors are set.
   1. Use triangular bracing near each corner on both sides of frames with temporary wood spreaders at midpoint.
   2. Use wood spreaders at bottom of frame if the shipping spreader is removed.
   3. Protect frame from accidental abuse.
   4. Where construction will permit concealment, leave the shipping spreaders in place after installation, otherwise remove the spreaders after the frames are set and anchored.
   5. Remove wood spreaders and braces only after the walls are built and jamb anchors are secured.

B. Floor Anchors:
   1. Anchor the bottom of door frames to floor with two 6 mm (1/4 inch) diameter expansion bolts. Use 9 mm (3/8 inch) bolts on lead lined frames.
   2. Power actuated drive pins may be used to secure frame anchors to concrete floors.

C. Jamb Anchors:
   1. Anchors in masonry walls: Embed anchors in mortar. Fill space between frame and masonry wall with grout or mortar as walls are built.
   2. Coat frame back with a bituminous coating prior to lining of grout filling in masonry walls.
   3. Secure anchors to sides of studs with two fasteners through anchor tabs. Use steel drill screws to steel studs.
   4. Frames set in prepared openings of masonry or concrete: Expansion bolt to wall with 6 mm (1/4 inch) expansion bolts through spacers. Where subframes or rough bucks are used, 6 mm (1/4 inch) expansion bolts on 600 mm (24 inch) centers or power activated drive pins 600 mm (24 inches) on centers. Secure two piece frames to subframe or rough buck with machine screws on both faces.

D. Install anchors for labeled fire rated doors to provide rating as required.

E. Frames for Sound Rated Doors: Coordinate to line frames for sound rated doors with insulation.

F. Overhead Bracing (Lead Lined Frames): Where jamb extensions extend to structure above, anchor clip angles with not less than two, 9 mm (3/8 inch) expansion bolts or power actuated drive pins to concrete slab. Weld to steel overhead members.

3.2 INSTALLATION OF DOORS AND APPLICATION OF HARDWARE

Install doors and hardware as specified in Section 08 11 13, HOLLOW METAL DOORS AND FRAMES; Section 08 14 00, WOOD DOORS, and Section 08 71 00, DOOR HARDWARE.

- - - E N D - - -

SECTION 08200 - Wood Doors

Part 1 - General

1.01 Description

A. Work of this Section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Stained and painted solid wood doors.
2. All drilling, tapping, reinforcements and cut outs as required to accommodate the installation of finish hardware.

B. Related Work Specified Elsewhere

1. Rough carpentry - Section 06100
2. Hollow Metal Frames - Section 08100
3. Finish hardware - Section 08700
4. Painting - Section 09900

1.02 Quality assurance

A. Doors shall conform to NWMA Industry Standard for solid wood panel doors of the National Woodwork Manufacturer's Association. Factory mark each door with the NWMA "Quality Certified" Seal of Approval for conformance with NWMA I.S.

1.03 SUBMITTALS

A. Manufacturer's data: For information only, submit three copies of door manufacturer's specifications and installation instructions for each type of wood door required to show compliance with the specified requirements. Indicate by transmittal form that copy of each instruction has been transmitted to the installer.

1. Include details of construction, trim for openings and similar components.

2. Include certifications as may be required to show compliance with the specifications.

3. Contractor will provide a 12" x 12" sample of finished door construction. Submit two (2) matching samples for approval by Architect.

B. Door Schedule

1. Submit a complete Schedule of Doors for approval by the Architect.

2. Each item listed shall be in accordance with the Specification and approved samples.

3. List door numbers and type as indicated on drawings.

4. Each item listed shall be identified with respect to:

   a. Manufacturer
   b. Brand
   c. Model number
   d. Material
   e. Finish
   f. Dimension and size
   g. Operation
   h. Hardware
   i. and all other information required to fully describe its location, function and use on the door and building.

5. The Architect will check the Door Schedule for quality and types only.

6. Submit copies of catalog cuts for all doors scheduled.

7. Supply copies of the final approved Door Schedule to the Architect and all affected trades.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaging: Wood doors shall be individually wrapped and sealed in waterproof cartons. Cartons and waterproof wrapping shall be marked with door site and location given on the door schedule on the drawings.

B. Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with the "On-Site Care" recommendations of NWMA pamphlet "Care and Finishing of Wood Doors" and with Manufacturer's instructions.

Part 2 - PRODUCTS

2.01 QUALITY CONTROL

A. Maximum allowable warp or twist in doors shall be 1/16 inch as measured by a 1/16 inch feeler gauge and a straight-edge extending from corner to corner of the door face at stiles, top and bottom rails and along both diagonals. The Architect may

accept slightly greater tolerances providing the hardware operates properly and the door operates without binding.

Part 3 - Execution

3.01 INSTALLATION (Refer to Section 06100).

END OF SECTION 08200

SECTION 08350 - Access Doors

Part 1 - General

1.01 Description

A. Work of this Section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Provide access doors as required to access mechanical and plumbing valves/controls.
2. Provide access door from second floor to mechanical attic

B. Related Work Specified Elsewhere

1. Membrane Roofing - Section 07531.
2. Hardware - Section 08700.

1.02 REFERENCES

A. Underwriters Laboratories, Inc. (UL)

B. National Fire Protection Association (NFPA)

C. Warnock Hersey (WHI)

1.03 SUBMITTALS

A. Product Data Catalog sheets, specifications, and installation instructions.

B. Shop Drawings Schedule of locations, details of construction and installation.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaging: Doors shall be individually wrapped and sealed in cartons. Cartons and wrapping shall be marked with door site and location given on the door schedule on the drawings.

Part 2 - PRODUCTS

2.01 MANUFACTURERS

A. J.L. Industries

B. or equal

2.02 ACCESS DOORS

A. 1 Hour Fire Rated Insulated Flush Access Panel for Ceiling with white powder coat finish.

Part 3 - Execution

3.01 INSTALLATION

A. Install the access doors in accordance with the manufacturer's printed installation instructions, except as shown or specified otherwise.

B. Coordinate access door installation with installation of supporting construction.

C. Set units accurately in position and securely attach to support with face panel plumb or level in relation to adjoining finish surface.

3.02 ADJUSTMENT

A. Adjust hardware and doors for proper operation.

END OF SECTION 08350

SECTION 084213 – ALUMINUM FRAMED ENTRANCES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes Tubelite Therml=Block Entrance Series and all system components and installation accessories. *<select>*
   1. Tubelite Therml=Block Medium Series

1.02 RELATED PRODUCTS

A. Single Manufacture: All products in divisions listed below shall be supplied by a single manufacturer. To ensure consistency in quality, warranty, finish, and product compatibility, products supplied by different manufacturers are not acceptable.
   a. Division 08 43 13 – Aluminum Framed Storefronts

1.03 PERFORMANCE REQUIREMENTS

A. Design Wind Loads
   1. Provide aluminum entrance system with all structural components including but not limited to anchors and mullions based on the following wind load design pressures and the deflection and stress criteria of paragraph 1.04 B. Pressures based on Allowable Stress Design (ASD).
      a. 22 psf positive and negative - typical zones
         34 psf negative - corner zones.
      b. Basic Wind Speed of 115 mph
         i. Exposure Category B
         ii. Importance factor 1
      c. Design criteria based on IBC 2018/ASCE 7-16 building code *or* wind pressure diagram.

B. Air and Structural Performance:
   1. Air Infiltration Performance:
      a. Shall not exceed 1.0 cfm/ft^2 at 1.57 psf static air pressure differential, when tested per ASTM 283.
   2. Structural Performance:
      a. Design Loads: System to withstand +/- 30 psf when tested per ASTM E330.
         i. Maximum allowable deflection of L/175 of the clear span for spans up to 13'-6" or L/240 of clear spans plus ¼" for spans greater than 13'-6" or an amount that restricts edge deflection of individual glazing lites of glass to ¾" whichever is smaller.
      b. 1.5x Design Loads: System to withstand +/- 45 psf when tested per ASTM E330.
         i. There shall be no permanent deformation of main frame members in excess of 0.2% of its clear span, glass breakage, or permanent damage to fasteners or anchors.

C. Thermal Transmittance and Condensation Resistance Performance Requirements
   1. Thermal transmittance (U-factor) for window system shall not exceed .56 BTU/hr-ft$^{2-\,O}$F per NFRC 100.

      a. U-Factor performance reference data per NFRC 100 thermal simulations:

		THERMAL=BLOCK ENTRANCE SYSTEM U-FACTOR (BTU/hr-ft²°F)							
DOOR TYPE	***SPACER***	***CENTER OF GLASS U-FACTOR*** (BTU/hr-ft^{2-O}F)							
		0.18	**0.20**	**0.22**	**0.24**	**0.26**	**0.28**	**0.29**	**0.30**
SINGLE – 10" bottom rail									
MEDIUM	aluminum	**0.56**	**0.57**	**0.57**	**0.59**	**0.60**	**0.61**	**0.61**	**0.62**
MEDIUM	warm edge	**0.55**	**0.56**	**0.56**	**0.58**	**0.59**	**0.60**	**0.60**	**0.61**
WIDE	aluminum	**0.57**	**0.58**	**0.59**	**0.60**	**0.61**	**0.61**	**0.62**	**0.62**
WIDE	warm edge	**0.56**	**0.57**	**0.57**	**0.59**	**0.59**	**0.60**	**0.61**	**0.61**
DOUBLE – 10" bottom rail									
MEDIUM	aluminum	**0.50**	**0.51**	**0.52**	**0.53**	**0.54**	**0.55**	**0.56**	**0.56**
MEDIUM	warm edge	**0.49**	**0.50**	**0.51**	**0.52**	**0.53**	**0.54**	**0.55**	**0.55**
WIDE	aluminum	**0.52**	**0.53**	**0.53**	**0.55**	**0.55**	**0.56**	**0.57**	**0.57**

WIDE	warm edge	**0.51**	**0.51**	**0.52**	**0.53**	**0.54**	**0.55**	**0.56**	**0.56**

2. Solar Heat Gain Coefficient (SHGC) for the window area shall not exceed [____] as determined in accordance with NFRC 200. *(Coordinate performance with 08 80 00 Glazing)*
3. Condensation Resistance Factor (CRF) shall meet or exceed 57 CRF_{frame} as determined in accordance with AAMA 1503.

1.04 SUBMITTALS

A. Product Data:
   1. Manufacturer's literature for each specified system.
   2. Components within assembly, including material descriptions, component profiles, finishes, anchorage and fasteners, glazing, and internal drainage.

B. Shop Drawings:
   1. Shop drawings must be prepared by a qualified engineering service under the employ of the installer.
   2. Include system dimensions, framed opening requirements and tolerances, affected related Work, anchorage, expansion and contraction joint location and details, and field welding required.

C. Include scaled shop drawings showing detailed relationships with glazing, flashing, internal drainage, joinery, and provisions for thermal expansion.

D. Design Data: Submit framing member structural and physical characteristics/dimensional limitations.

E. Samples:
   1. System components: Submit corner samples, anchors, fasteners, trim, and other materials as requested by the architect.
   2. Finish: Submit [two] aluminum sheet stock samples [2" x 3"] for each finish type.

F. Warranty: Submit manufacturer sample warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

G. Entrance Door Hardware Schedule: Coordinate entrance door hardware schedule with doors, frames, and related work for sizes, orientation, thickness, hardware types and finishes.

1.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least twenty years of documented experience.

B. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State that the Project is located.

C. Installer: Company approved by manufacturer and specializing in performing work of this section with at least 10 years of [documented] installation experience.

D. Source Limitations: Obtain the entrances and all products listed in Section 1.02 from a single manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Materials to be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.

B. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of this Work to be performed according to manufacturer's installation instructions and warranty requirements.

B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before fabrication of entrance framing and indicate measurements on Shop Drawings.

C. Install sealant according to sealant manufacturer guidelines.

D. Coordinate installation with other applicable trades.

1.08 WARRANTY

A. Aluminum Therml=Block Entrance Warranty:
   1. Manufacturer agrees to repair or replace defective entrance components for a period of 10 years from the date of shipment.
   2. The warranty for Tubelite's tie rod corner construction extends to the useful life of the entrance door.

B. Finish Warranty:
   1. Warranty covers factory-applied organic and anodic finishes on exposed extruded aluminum surfaces without standing water accumulation, against peeling, checking, cracking, chalking and change of color, per applicable AAMA specifications.
      a. Anodized Coatings
         i. AAMA 611 Class I: 10 years

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Basis of Design: Aluminum Framed Thermal Entrances
   1. Tubelite Inc. Therml=Block Entrance Series: Medium], [Wide] stile. *<select>*
   2. Substitutions
      a. Manufacturer's products that meet specified design requirements may be considered as a substitution. Substitution requests / submittals must include the following, and be submitted at least ten working days prior to the bid date.
         i. Submittal information must include test reports as specified in performance sections.
         ii. Copy of manufactures warranty
         iii. Any additional information as requested
         iv. System details / samples

2.02 ALUMINUM FRAMED ENTRANCES

A. Aluminum Framed Thermal Entrances: Factory fabricated, field glazed, factory finished aluminum, with tie rod construction.
   1. System description: Wide/Double Door] >

TYPE	VERTICAL STILES	TOP RAIL	BOTTOM RAIL
WIDE	5"	5"	10"

      a. Depth: 1-3/4"
      b. Optional:
         i. Threshold Blade Sweep on bottom rail attached at interior.
      c. Threshold: Extruded thermally broken aluminum threshold machined to fit door type and size. Standard thresholds are ½" in height and beveled to the floor on both sides for easy accessibility. Butt type tile thresholds are optional.
   2. Glass and Glazing:
      a. Thickness: 1"

2.03 FINISHES

A. Finish all exposed areas of aluminum entrance components in accordance with applicable AAMA Voluntary Finish Guide Specification:

SPECIFICATION	DESCRIPTION	DESIGNATION	COLOR
AAMA 611	Class I - Color anodize coating, Eco-friendly etch (0.7 mils thick min)	AA-M10C21A44	Dark Bronze

A. Combination anodic oxide and transparent organic coatings as defined in AAMA 612 are not equivalent substitutions for the AAMA 611 anodized finishes shown above due to surface hardness disparities.
B. Applicator Qualifications: Certified by AAMA and listed on AAMA Verified Components List.
C. Verify accuracy of components, quantities, and sizes prior to application of finishes.
D. Applicator – PVDF Based Finishes:
   a. Use regenerative thermal oxidizer to destroy VOC's.
   b. Utilize chrome-based five –stage pretreatment system applied in accordance with AAMA and ASTM standards. Use of a chrome-based five-stage system ensures long-term adhesion and an option for an extended warranty.
   c. Possess in-house blending capabilities, allow for only specific amount of paint needed for each project.

d. Utilize automated rotary atomization spray bell application providing uniform coverage with manual spray reinforcement for coverage in areas unreachable by automation.
e. Employ skilled professional field service division to repair warranty or application issues arising at Project site.
f. Utilize documented quality control protocol in accordance with AAMA procedures.

E. Applicator – Anodize Finishes
   a. Offer both standard eco-friendly (acid) and optional caustic (traditional) etching technologies.
   b. Utilize fully automated, computer-controlled process lines for consistency through Project.
   c. Utilize documented quality control protocol in accordance with AAMA 611 procedures.
      i. Online quality assurance inspection:
         1. Random sample check for color uniformity, maximum difference of 5AE.
         2. Random coating thickness testing:
            a. Class I clear and color anodize – 0.7 mils (18 microns)
            b. Class II clear anodize – 0.4 mils (10 microns)

2.04 MATERIALS

A. Aluminum extrusions: 6063-T6 or 6063-T5 alloy and temper in accordance with ASTM B221, and extruded within commercial tolerances and free from defects that impair strength and/or durability.
B. Tie rods: Steel tension tie-rods of 3/8" diameter shall run the full width of the top and bottom rails and shall be fixed with steel plates and lock nuts.
C. Thermal Break:
   1. Rails, Stiles, and Frames: Glass fiber reinforced polyamide extrusion mechanically crimped into cross-knurled cavities.
   2. Threshold: Two part chemically curing, unfilled polyurethane casting resin poured in place. Thermal barrier extrusion pour cavities shall be mechanically lanced or Azo-Braded® to secure the thermal break material.
D. Weatherstrip: Entrance frame members shall have dual durometer bulb weatherstripping at the head and jamb members.
E. Threshold Blade Sweep: Aluminum extrusion with EPDM blade sweep gasket attached to interior exposed surface of bottom rail with concealed fasteners. *(required to meet specified air performance)*
F. Primary extruded rail and stile members will be a minimum 0.125" thick.
G. Entrance frames shall be 0.080" minimum increased to 0.125" at hardware attachment locations.
H. Extruded or formed trim components will be a minimum 0.050" thick.
I. Exposed Flashings: aluminum sheet; finish matching framing members.
J. Structural Steel Reinforcement and anchors necessary to meet the performance requirements of 1.04.
   1. ASTM A36/A36M; [galvanized per ASTM A123/A123M] or [shop primed]. *<select>*
   2. Where galvanizing is not compatible with alloy of component parts, apply heavy coating of epoxy paint where necessary to prevent galvanic action with dissimilar materials.
K. Galvanizing Repair Paint: High zinc content paint for over welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight and in compliance with SSPC Paint 20.
L. Bituminous Paint: Cold applied asphalt mastic, containing no asbestos fibers.
M. Door stops shall be snap-in design eliminating the use of exposed screws.
N. Glazing and Sealant material:
   1. Glazing method shall be in accordance with manufacturer installation instructions and the GANA Glazing Manual for specified glass type or as approved by the glass manufacturer. Refer to section 08 80 00.
   2. Glazing gaskets shall be replaceable and made from extruded EPDM reinforced with non-stretchable integral cord.
   3. Setting blocks and Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual and glass manufacture.
   4. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
   5. Frame joinery sealants shall be suitable for application specified and as tested and approved by the entrance manufacturer.

2.05 FABRICATION

A. Ensure joints and corners are flush, hairline and weatherproof, accurately fitted and secured.
   1. Prepare framework to receive anchors and hardware.
   2. Conceal fasteners from view.
   3. Reinforce framework as required for imposed loads.
B. Expansion and Contraction: Fabricate to allow for thermal movement of materials when subjected to project temperature differential requirements.
D. Allow for movement between entrance and adjacent construction, without damage to components or deterioration of seals.
E. Provide for membrane interface as indicated on architectural drawings.
F. Fabricate entrance door corners using steel tie rods connection design allowing for field adjustment.

PART 3 – EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of this Work.
B. Notify Contractor in writing, with a copy sent to Owner and Architect, of any conditions detrimental to proper and timely completion of this Work.
C. Proceed with installation only after unsatisfactory conditions have been corrected.
D. Start of this Work shall indicate acceptance of areas and conditions as satisfactory by the Installer.

3.02 INSTALLATION

A. Preparation: Coordinate and furnish anchors, concrete inserts, sleeves, anchor bolts, and other accessories to be embedded in concrete or masonry construction or welded to structural steel. Coordinate delivery of these items to project site.
B. Install aluminum entrances in accordance with manufacturer's installation instructions, reviewed product data, approved shop drawings, and as indicated on Drawings (per Professional Engineer review when applicable).
C. Do not install damaged components.
D. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
E. Provide alignment attachments and shims to permanently fasten system to building structure.
F. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, [aligning with adjacent work].
G. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
H. Coordinate attachment and seal of membrane materials per architectural drawings. Refer to section 07 25 00.
I. Install accessories with positive anchorage to building, weather tight mounting, provisions for thermal expansion, and coordinate installation with flashings and other components.
J. Install hardware using templates provided. Refer to Section 08 71 00 for hardware installation requirements.
K. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
L. Install perimeter sealant in accordance with Section 07 92 00.
M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
N. Adjust operating hardware for smooth operation.
O. Tolerances:
    1. Maximum variation from plumb: 1/16” every 3’ non-cumulative, or 1/16” per 10’, whichever is least.
    2. Maximum Misalignment of two adjoining members abutting in plane: 1/32”.

3.03 CLEANING

A. Comply with AAMA 609 and 610 for methods, equipment, and materials to clean finished aluminum after installation and for subsequent periodic maintenance.
B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Rinse with clear water. Take care to remove dirt from corners, and wipe surfaces clean.
C. Remove excess sealant from glass and aluminum by method acceptable to sealant and finish manufacturer.

3.04 PROTECTION

A. Protect installed products from damage during subsequent construction.
B. Protect anodized finishes from prolonged exposure to alkaline, such as lime in masonry mortar, or acidic and other corrosive materials.

END OF SECTION 08 42 13
This document supersedes all previous versions.

SECTION 08 43 13 – ALUMINUM FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes Tubelite aluminum storefront and all components and installation accessories supplied with the system.
   1. Tubelite 24650 Series Storefront systems: 2" x 6-1/2"
      a. TU24650 Storefront (dual thermal barrier)

1.02 RELATED PRODUCTS

A. Single Manufacture: All products in divisions listed below shall be supplied by a single manufacturer. To ensure consistency in quality, warranty, finish, and product compatibility, products supplied by different manufacturers are not acceptable.
   a. Division 08 42 13 - Aluminum Framed Entrances

1.03 PERFORMANCE REQUIREMENTS

A. Design Wind Loads
   1. Provide aluminum storefront system with all structural components including but not limited to anchors and mullions based on the following wind load design pressures and the deflection and stress criteria of paragraph 1.04 B. Pressures based on Allowable Stress Design (ASD).
      a. 22 psf positive and negative - typical zones
         34 psf negative - corner zones.
      b. Basic Wind Speed of 115mph
         i. Exposure Category B
         ii. Importance factor 1
      c. Design criteria based on IBC 2018/ASCE 7-16 building code *or* wind pressure diagram.

1.04 PERFORMANCE REQUIREMENTS (continued)

B. Air, Water and Structural Performance:
   1. Air Infiltration Performance:
      a. Shall not exceed 0.06 cfm/ft^2 at 6.24 psf static air pressure differential, when tested per ASTM 283.
   2. Water Infiltration Performance:
      a. Static: No uncontrolled water entry at a 12 psf static pressure differential with water applied at a minimum rate of 5 gal/ft^2 hr when tested per ASTM E 331.
      b. Dynamic: No uncontrolled water entry at 12 psf dynamic pressure with water applied at a minimum rate of 5 gal/ft^{2}hr when tested per AAMA 501.1.
   3. Structural Performance at design loads:
      a. System to withstand +/- 30 psf when tested per ASTM E330.
         i. Maximum allowable deflection of L/175 of the clear span for spans up to 13'-6" or L/240 of clear spans plus ¼" for spans greater than 13'-6" or an amount that restricts edge deflection of individual glazing lites of glass to ¾" whichever is smaller.
   4. Structural Performance at 1.5x design loads:
      a. System to withstand +/- 45 psf when tested per ASTM E330.
         i. There shall be no permanent deformation of main frame members in excess of 0.2% of its clear span, glass breakage, or permanent damage to fasteners or anchors.
   5. Thermal Cycling:
      a. There shall be no air and water infiltration exceeding primary performance requirements, buckling, stress on glass, edge seal failure, excess stress on structure, anchors and fasteners, or reduction in performance when tested in accordance with AAMA 501.5 at a temperature range of -20 °F to 180 °F. Interior ambient air temperature at 70°F (+/- 5 °F) for hot and cold cycles.
   6. Interstory Differential Horizontal Movement per AAMA 501.4.
      a. 3 cycles: 1.68" left, back to zero, 1.68" right, back to zero (one complete cycle)
         i. There shall be no failure or gross permanent distortion of anchors, frame, glass, or panels. Glazing gaskets may not disengage and weather seals may not fail.
   7. Seismic Horizontal Movement at 1.5X design displacement per AAMA 501.4.
      a. 3 cycles: 2.4" left, back to zero, 2.4" right, back to zero (one complete cycle).

i. There shall be no glass breakage, permanent damage to frame members or anchors.

C. Acoustic Performance:
   a. The system shall have a sound transmission class (STC) and an outdoor-indoor transmission class (OITC) rating when tested per ASTM E90 and ASTM E1332. Coordinate performance with 08 80 00 Glazing.
      i. TU24650 Storefront: STC 29, OITC 25 *< 1" IGU: 1/4", 1/2" air space, 1/4" >*
   b. Test results using glass-only values is not acceptable.

D. Thermal Transmittance and Condensation Resistance Performance Requirements
   1. Thermal transmittance (U-factor) for window system shall not exceed .37 BTU/hr-ft^2- ^{O}F per NFRC 100.

      a. U-Factor performance reference data per NFRC 100 thermal simulations:

	24650 SYSTEM U-FACTOR (BTU/hr-ft^2-^{O}F)			
CENTER OF GLASS U-FACTOR (BTU/hr-ft^2-^{O}F)	**T24650** (single thermal) *aluminum spacer*	**T24650** (single thermal) *warm edge spacer*	**TU24650** (dual thermal) *aluminum spacer*	**TU24650** (dual thermal) *warm edge spacer*
0.30	**0.43**	**0.40**	**0.40**	**0.37**
0.29	**0.42**	**0.40**	**0.39**	**0.36**
0.28	**0.41**	**0.39**	**0.38**	**0.36**
0.26	**0.39**	**0.37**	**0.36**	**0.34**
0.24	**0.38**	**0.35**	**0.35**	**0.32**
0.22	**0.35**	**0.32**	**0.32**	**0.29**
0.20	**0.34**	**0.31**	**0.31**	**0.28**
0.18	**0.32**	**0.30**	**0.30**	**0.26**

NOTE: The above table for reference only. Please contact a Tubelite representative for system U-Factors using project specific glass and framing. Values based on 6-1/2" system depth and determined in accordance with NFRC 100 for a glazed wall configuration.
Glass makeup: 1" IGU with ¼" lites, and ½"gap.

1.04 PERFORMANCE REQUIREMENTS (continued)

2. Condensation Resistance Factor (CRF) shall meet or exceed 75 CRF_{frame} and 70 CRF_{glass} as determined in accordance with AAMA 1503.
   a. CRF performance data:

	CONDENSATION RESISTANCE FACTOR (CRF)	
SYSTEM	**FRAME**	**GLASS**
E24650	**n/a**	**n/a**
T24650	**64**	**69**
TU24650	**75**	**70**

1.05 SUBMITTALS

A. Product Data:
   1. Manufacturer's literature for each specified system.
   2. Components within assembly, including material descriptions, component profiles, finishes, anchorage and fasteners, glazing, and internal drainage.

B. Shop Drawings:
   1. Shop drawings must be prepared by a qualified engineering service under the employ of the installer.
   2. Include system dimensions, framed opening requirements and tolerances, affected related Work, anchorage, expansion and contraction joint location and details, and field welding required.
   3. Include scaled shop drawings showing detailed relationships with glazing, flashing, internal drainage, joinery, and provisions for thermal expansion.

C. Design Data: Submit framing member structural and physical characteristics, and dimensional limitations.
D. Samples:
   1. System components: Submit corner samples, anchors, fasteners, trim, and other materials as requested by the architect.
   2. Finish: Submit [two] aluminum sheet stock samples [2" x 3"] for each finish type.
E. Warranty: Submit manufacturer sample warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least twenty years of documented experience.
B. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State that the Project is located.
C. Installer: Company approved by manufacturer and specializing in performing work of this section with at least 10 years of installation experience.
D. Source Limitations: Obtain the storefront and all products listed in Section 1.02 from a single manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Materials to be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.
B. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of this Work to be performed according to manufacturer's installation instructions and warranty requirements.
B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before fabrication of storefront framing and indicate measurements on Shop Drawings.
C. Install sealant according to sealant manufacturer guidelines.
D. Coordinate installation with other applicable trades.

1.09 WARRANTY

A. Aluminum Storefront Framing Warranty:
   1. Manufacturer agrees to repair or replace defective storefront components for a period of 5 years from the date of shipment.

B. Finish Warranty:
   1. Warranty covers factory-applied organic and anodic finishes on exposed extruded aluminum surfaces without standing water accumulation, against peeling, checking, cracking, chalking and change of color, per applicable AAMA specifications.
      a. Paint Coatings
         i. AAMA 2604 50% PVDF: 10hyears
      b. Anodized Coatings
         i. AAMA 611 Class I: 10hbyears

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Basis of Design: Aluminum Framed Storefront
   1. Tubelite Inc. TU24650 Series Storefront: 2" x 6-1/2" dual thermal barrier
   2. Substitutions
      a. Manufacturer's products that meet specified design requirements may be considered as a substitution. Substitution requests / submittals must include the following, and be submitted at least ten working days prior to the bid date.
         i. Submittal information must include test reports as specified in performance sections.
         ii. Copy of manufactures warranty
         iii. Any additional information as requested
         iv. System details / samples

2.03 ALUMINUM FRAMED STOREFRONT

A. Aluminum Framed Storefront: Factory or field fabricated, field glazed, factory finished aluminum, screw spline construction with infill and related flashings, anchorage and attachment devices.
   1. System dimensions: 2" x 6-1/2"
      a. Exterior face dimensions
         i. Primary mullions: 2"
         ii. Expansion mullion: 2-5/8"
      b. Depth: 6-1/2"
      c. Corner mullions
         i. 90°: 7-7/8" [inside][outside] *<select>*
   2. Glazing:
      a. Position: 1-3/4" from exterior
      b. Thickness: 1"
      c. Method: outside glazed, captured and retained with gaskets on all four sides
   3. TU24650 thermal barrier
         i. Primary frames: dual pour- debridge

2.04 FINISHES

A. Finish all exposed areas of aluminum storefront components in accordance with applicable AAMA Voluntary Finish Guide Specification:

SPECIFICATION	DESCRIPTION	DESIGNATION	COLOR
AAMA 611	Class I - Color anodize coating, Eco-friendly etch (0.7 mils thick min)	AA-M10C21A44	Dark Bronze

A. Combination anodic oxide and transparent organic coatings as defined in AAMA 612 are not equivalent substitutions for the AAMA 611 anodized finishes shown above due to surface hardness disparities.
B. Applicator Qualifications: Certified by AAMA and listed on AAMA Verified Components List.
C. Verify accuracy of components, quantities, and sizes prior to application of finishes.
D. Applicator – PVDF Based Finishes:
   a. Use regenerative thermal oxidizer to destroy VOC's.
   b. Utilize chrome-based five –stage pretreatment system applied in accordance with AAMA and ASTM standards. Use of a chrome-based five-stage system ensures long-term adhesion and an option for an extended warranty.
   c. Possess in-house blending capabilities, allow for only specific amount of paint needed for each project.
   d. Utilize automated rotary atomization spray bell application providing uniform coverage with manual spray reinforcement for coverage in areas unreachable by automation.
   e. Employ skilled professional field service division to repair warranty or application issues arising at Project site.
   f. Utilize documented quality control protocol in accordance with AAMA procedures.
E. Applicator – Anodize Finishes
   a. Offer both caustic (traditional) and eco-friendly (acid) etching technologies.
   b. Utilize fully automated, computer-controlled process lines for consistency through Project.
   c. Utilize documented quality control protocol in accordance with AAMA 611 procedures.
      i. Online quality assurance inspection:
         1. Random sample check for color uniformity, maximum difference of 5AE.
         2. Random coating thickness testing:
            a. Class I clear and color anodize – 0.7 mils (18 microns)
            b. Class II clear anodize – 0.4 mils (10 microns)

2.02 MATERIALS

A. Aluminum extrusions: Alloy 6063-T6 or 6063-T5 in accordance with ASTM B221, and extruded within commercial tolerances and free from defects that impair strength and/or durability.
   1. Optional recycled aluminum: *<specify as required>*
      a. Provide EcoLuminum™ by Tubelite containing 70% recycled aluminum comprised of 55% pre-consumer and 15% post-consumer material.

B. Primary extruded framing members will be a minimum 0.075" thick.
C. Extruded or formed trim components will be a minimum 0.060" thick.
D. Exposed Flashings: aluminum sheet; finish matching framing members.
E. Structural Steel Reinforcement and anchors necessary to meet the performance requirements of 1.04.
   1. ASTM A36/A36M; [galvanized per ASTM A123/A123M] or [shop primed]. *<select>*
   2. Where galvanizing is not compatible with alloy of component parts, apply heavy coating of epoxy paint where necessary to prevent galvanic action with dissimilar materials.
F. Galvanizing Repair Paint: High zinc content paint for over welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight and in compliance with SSPC Paint 20.
G. Bituminous Paint: Cold applied asphalt mastic, containing no asbestos fibers.
H. Thermal Barrier:
   1. Pour and debridge thermal barrier shall be a two part chemically curing polyurethane casting resin poured in place. specified. Thermal barrier extrusion pour cavities shall be mechanically lanced to secure the thermal break material. The aluminum bridge section must be removed to provide a nominal ¼" separation between exterior and interior metal surfaces.
   2. Continuous extruded polyamide with 25% glass fiber reinforcing, mechanically crimped into cross-knurled cavities
I. Glazing and Sealant material:
   1. Setting blocks and Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-e glass shall be silicone.
   2. Glazing gaskets shall be EPDM [silicone], weather-resistant, and compatible with all materials in contact.
   3. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
   4. Frame joinery sealants shall be suitable for application specified and as tested and approved by the storefront manufacturer.

2.03 FABRICATION

A. Ensure joints and corners are flush, hairline and weatherproof, accurately fitted and secured.
   1. Prepare framework to receive anchors and hardware.
   2. Conceal fasteners and attachments from view.
   3. Reinforce framework as required for imposed loads.
B. Expansion and Contraction: Fabricate to allow for thermal movement of materials when subjected to project temperature differential requirements.
C. System Internal Drainage: Drain to exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   1. Fabricate drainage system so weeps and flashings are integral to system and others are not required.
D. Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
E. Provide for membrane interface as indicated on architectural drawings

2.04 COMPONENTS

A. Glass
   1. Provide in accordance with Section 08 80 00.
B. Glazing
   1. Glazing method shall be in accordance with manufacturer installation instruction and the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.
   2. Refer to Section 08 80 00 for requirements.
C. Operable Windows: Provide operable windows at locations indicated on the architectural drawings.
   1. Basis of design: Tubelite 3700 Series Windows
      a. 3700 Awning
      b. Refer to Section 08 51 13 for requirements.
D. Muntins:
   1. Provide muntin grids as shown on architectural drawings. Finish to match storefront frames.

PART 3 – EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of this Work.
B. Notify Contractor in writing, with a copy sent to Owner and Architect, of any conditions detrimental to proper and timely completion of this Work.
C. Proceed with installation only after unsatisfactory conditions have been corrected.
D. Start of this Work shall indicate acceptance of areas and conditions as satisfactory by the Installer.

3.02 INSTALLATION

A. Preparation: Coordinate and furnish anchors, concrete inserts, sleeves, anchor bolts, and other accessories to be embedded in concrete or masonry construction or welded to structural steel. Coordinate delivery of these items to project site.
B. Install aluminum storefront framing in accordance with manufacturer's installation instructions, reviewed product data, approved shop drawings, and as indicated on Drawings (per Professional Engineer review when applicable).
C. Do not install damaged components.
D. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
E. Provide alignment attachments and shims to permanently fasten system to building structure.
F. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, [aligning with adjacent work].
G. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
H. Coordinate attachment and seal of membrane materials per architectural drawings. Refer to section 07 25 00.
I. Install accessories with positive anchorage to building, weather tight mounting, provisions for thermal expansion, and coordinate installation with flashings and other components.
J. Install hardware using templates provided.
    1. Refer to Section 08 71 00 for hardware installation requirements.
K. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
L. Install perimeter sealant in accordance with Section 07 92 00.
M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
N. Adjust operating hardware for smooth operation.
O. Tolerances:
    1. Maximum variation from plumb: 1/16” every 3’ non-cumulative, or 1/16” per 10’, whichever is least.
    2. Maximum Misalignment of two adjoining members abutting in plane: 1/32”.

3.03 CLEANING

A. Comply with AAMA 609 and 610 for methods, equipment, and materials to clean finished aluminum after installation and for subsequent periodic maintenance.
B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths.
C. Take care to remove dirt from corners, and wipe surfaces clean.
D. Remove excess sealant from glass and aluminum by method acceptable to sealant and finish manufacturer.

3.04 PROTECTION

A. Protect installed products from damage during subsequent construction.
B. Protect anodized finishes from prolonged exposure to alkaline, such as lime in masonry mortar, or acidic and other corrosive materials.

END OF SECTION 08 43 13

Section 08 54 00 Fiberglass Awning Windows

Part 1 General

1.1 Section Includes

A. Elevate® Awning complete with hardware, glazing weather strip, insect screen, grilles-between-the-glass, simulated divided lite, jamb extension, and standard or specified anchors, trim and attachments.

1.2 Construction Specification Institute (CSI) MasterFormat Numbers and Titles

A. Section 07 92 00 – Joint Sealants: Sill sealant and perimeter caulking

B. Section 08 71 00 – Door Hardware: Hardware other than furnished by door and frame manufacturer

C. Section 09 90 00 – Paints and Coatings: Paint and stain other than finish

1.3 References

A. ASTM, International:

1. E283: Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

2. E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference

3. E547: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Cyclic Air Pressure Difference

4. E2190: Standard Specification for Insulating Glass Unit Performance and Evaluation

5. C1036: Standard Specification for Flat Glass

6. E2112: Standard Practice for Installation of Exterior Windows, Doors, and Skylights

B. North American Fenestration Standard (NAFS) - American Architectural Manufacturer's Association/Window and Door Manufacturer's Association/Canadian Standards Association (AAMA/WDMA/CSA 101/I.S.2/A440):

1. AAMA/WDMA/CSA 101/I.S.2/A440-17: NAFS: North American Fenestration, Standard/Specification for windows, doors, and skylights

C. Window and Door Manufacturers Association (WDMA)

1. WDMA I.S.4: Industry Standard for Water Repellent Preservative Treatment for Millwork

2. WDMA I.S.2: Hallmark Certification Program

D. Insulating Glass Certification Council (IGCC) and Fenestration Glazing Industry Alliance (FGIA) Glass Products Council (GPC)

E. Fenestration Glazing Industry Alliance (FGIA) – note: AAMA combined with IGMA and formed FGIA as of 08/01/2019

1. AAMA 2605: Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels

F. National Fenestration Rating Council (NFRC):

1. NFRC 101: Procedure for Determining Fenestration Product Thermal Properties

2. NFRC 200: Procedure for Determining Solar Heat Gain Coefficients at Normal Incidence

G. Window Covering

1. WCMA A100.0: American National Standard for Safety of Window Covering Products

1.4 System Description

A. Design and Performance Requirements:

Product	Air Tested to psf	Water Tested to psf	Certification Rating	Max Overall Width	Max Overall Height
Elevate Awning (4947)	1.57	7.5	LC-PG50-AP	48	47 1/8

A. Air leakage shall not exceed the following when tested at 1.57 psf according to ASTM E283: 0.30 cfm per square foot of frame.

B. No water penetration when tested at the following pressure according to ASTM E547:9.75 psf

C. Assembly shall with stand a positive or negative uniform static air pressure difference of psf without damage when tested according to ASTM E330.

D. Impact and Cycling per ASTME1996 and E1886 with passing results for Missile Level D and Pressure Cycling of +55/-55 psf.

1.5 Submittals

A. Shop Drawings: Submit shop drawings under provision of CSI MasterFormat Section 01 33 23.

B. Product Data: Submit catalog data under provision of CSI MasterFormat Section 01 33 23.

C. Samples:

1. Submit corner section under provision of CSI MasterFormat Section 01 33 23.

2. Include glazing system, quality of construction, and specified finish.

D. Quality Control Submittals: Certificates: Submit manufacturer's certification indicating compliance with specified performance and design requirement under provision of CSI MasterFormat Section 01 33 23.

1.6 Quality Assurance

A. Requirements: Consult local code for IBC [International Building Code] and IRC [International Residential Code] adoption year and pertinent revisions for information on:

1. Egress, emergency escape and rescue requirements.

2. Basement window requirements.

3. Windows fall prevention and/or window opening control device requirements.

1.7 Delivery

A. Comply with provisions of CSI MasterFormat Section 01 65 00.

B. Deliver in original and protect from weather.

1.8 Storage and Handling

A. Prime and seal wood surfaces, including to be concealed by wall construction, if more than thirty (30) days will expire between delivery and installation.

B. Store window units in an upright position in a clean and dry storage area above ground to protect from weather under provision of CSI MasterFormat Section 01660.

1.9 Warranty

The following limited warranty is subject to conditions and exclusions. There are certain conditions or applications over which Marvin has no control. Defect or problems as a result of such conditions or applications are not the responsibility of Marvin. For a more complete description of the Marvin limited warranty, refer to the complete and current warranty information that is available at http://www.marvin.com/support/warranty.

A. Clear insulating glass with stainless steel spacers is warranted against seal failure caused by manufacturing defects and resulting in visible obstruction through the glass for twenty (20) years from the original date of purchase. Glass is warranted against stress cracks caused by manufacturing defects from ten (10) years from the original date of purchase.

B. Hardware and other non-glass components are warranted to be free from manufacturing defects for ten (10) years from the original date of purchase.

Part 2 Products

2.1 Manufactured Units

A. Description: Elevate® Awning unit (and related stationary or picture units) as manufactured by Marvin Windows and Doors, West Fargo, North Dakota.

2.2 Frame Description

A. Interior: clear pine exposed surfaces

1. Kiln-dried to moisture content no greater than twelve (12) percent at the time of fabrication

2. Water repellant, preservative treated in accordance with ANSI/NWWDA I.S.4.

B. Exterior: Fiberglass reinforce Ultrex®, 0.080” (2mm) thick

C. Composite frame thickness: 1 5/16” (33mm).

D. Frame depth: 4 9/16” (116mm).

2.3 Sash/Panel Description

A. Interior: pine

1. Kiln-dried to moisture content no greater than twelve (12) percent at time of fabrication

2. Water repellant preservative treated in accordance with ANSI/NWWDA I.S.4.

B. Exterior: fiberglass reinforced Ultrex®, 0.080” (2mm) thick

C. Composite sash thickness: 1 9/16” (40mm) – standard glass; 1 31/32” (50mm) – Tri-pane.

2.4 Glazing

A. Select quality complying with ASTMC1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E2190.

B. Glazing Method: 11/16 (17mm) inch insulating glass.

C. Glass Type: Low E

D. Glazing Seal: Silicone bead at interior and exterior.

E. Glazing option: Simulated Divided Lites with Spacer Bars.

2.5 Finish

A. Exterior:

1. Pultruded Fiberglass.
2. Factory baked on acrylic urethane.
3. Meets AAMA 624-10 requirements.
4. Color: Pebble Gray.

B. Interior:

1. Optional clear interior.

2.6 Hardware

A. Lock: Multipoint locking mechanism is actuated from a simgle point of operation. The lock mechanism is concealed with only the actuator handle and escutcheon being visible.

B. Hinges: Concealed stainless steel track and injection molded shoe.

C. Handle: Die cast detachable folding handle.

D. Roto Gear Operator: E-Gard™ coated hinge arm and housing mechanism.

E. Snubber: Pulls the sash tight to the frame and provides positive engagement to keep the sash in place under structural loads.

F. Color: Applies to the handle and locking hardware:

1. Oil Rubbed Bronze

2.8 Optional Hardware

A. Casement Window Opening Control Device – Factory applied.

1. Minimum frame OSM: 17 27/32” (453mm) x 31 1/8” (791); Maximum frame OSM: 36” (914) x 71 1/8” (1807).
2. WOCD locking assembly: Factory installed. Die cast. Color: White, Almond Frost, Matte Black
3. WOCD tether assembly: Factory installed. Injection molded nylon. Color: E-Guard™ color match

B. Sash Limiter – 3” Travel - Factory or Field applied

4. Awning min frame OSM: 24” (610mm) x 23” (584mm)

2.7 Weather Strip

A. Weather stripped at frame and sash perimeter with flexible gaskets.

1. Color: Black.

2.8 Insect Screen

A. Factory Installed

1. Screen mesh, 18 by 16: charcoal fiberglass.

2. Aluminum frame finish: Almond Frost, White, Ebony or Bare Wood Veneer.

2.9 Simulated Divided Lites (SDL)

A. 7/8” (22mm) wide. Available with optional interior spacer bar

1. Exterior muntins: Ultrex finished to color match exterior

2. Interior muntins: clear interior

3. Pattern:

a. As shown on drawings

2.10 Accessories and Trim

A. Installation Accessories:

1. Factory-installed nailing fin at head, sill and side jambs.

2. Installation Brackets: Brackets for 4 9/16” (116mm); 6 9/16” (167mm).

3. Mullion kit: Mullion kit for field assembly of units – Kit includes: instructions, aluminum pins, filler blocks, wood mullion tie, sealant foam tape, interior mullion trim, mullion insulation and nailing fin connectors.

4. Structural mullion kit: structural mullion kit for field assembly of units. Kits includes: instructions, reinforcement member, aluminum pins, wood mullion tie, sealant foam tape, interior mullion trim, #8 x 1 3/4” screws, #7 x 1 5/8” screws, nailing fin connectors and structural brackets.

5. Pole operator with adapter for each sash indicated. Mill finish aluminum. Length: (five feet) (eight feet) (eleven feet six inches).

6. Installation clips standard with nailing fin on impact glazed windows.

Part 3 Execution

3.1 Examination

A. Verification of Condition: Before installation, verify openings are plumb, square and of proper dimensions as required in CSI MasterFormat Section 01 71 00. Report frame defects or unsuitable conditions to the General contractor before proceeding.

B. Acceptance of Condition: Beginning on installation confirms acceptance of existing conditions.

3.2 Installation

A. Comply with CSI MasterFormat Section 01 73 00.

B. Assemble and install window/door unit(s) according to manufacturer's instruction and reviewed shop drawing.

C. Install sealant and related backing materials at perimeter of unit or assembly in accordance with CSI MasterFormat Section 07 92 00 Joint Sealants. Do not use expansive foam sealant.

D. Install accessory items as required.

E. Use finish nails to apply wood trim and mouldings.

3.3 Field Quality Control

A. Remove visible labels and adhesive residue according to manufacturer's instruction.

B. Unless otherwise specified, air leakage resistance tests shall be conducted at a uniform static pressure of 75 Pa (~1.57 psf). The maximum allowable rate of air leakage shall not exceed 2.3 L/sm^2 (~0.45 cfm/ft^2).

C. Unless otherwise specified, water penetration resistance testing shall be conducted per AAMA 502 and ASTM E1105 at 2/3 of the fenestration products design pressure (DP) rating using "Procedure B" – cyclic static air pressure difference. Water penetration shall be defined in accordance with the test method(s) applied.

3.4 Cleaning

A. Remove visible labels and adhesive residue according to manufacturer's instruction.

B. Leave windows and glass in a clean condition. Final cleaning as required in CSI MasterFormat Section 01 74 00.

3.5 Protecting Installed Construction

A. Comply with CSI MasterFormat Section 07 76 00.

B. Protecting windows from damage by chemicals, solvents, paint or other construction operations that may cause damage.

End of Section

SECTION 085550 - WOOD WINDOW AND VENT RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 RELATED SECTIONS

A. Section 085269, Storm Windows, Aluminum, Residential
B. Section 099100, Painting, surfaces other than wood windows

1.3 SUMMARY

A. Furnish all labor, materials, tools, equipment and services necessary and reasonably incidental to restore existing wood windows as indicated on the Drawings.

B. Work detailed and scheduled includes, but is not limited to the following:

1. Repair/restore existing frames, sills and sash for all window/vent openings.
2. Repair existing window/vent frames, sills and trim material in-situ. Restore in existing openings. No frame or sill removals will be permitted. Prepare for painting and apply paint.
3. Weather strip sash.
4. Install new storm sash in all restored window/vent openings.

1.4 HISTORIC BUILDING

A. Project work involves rehabilitation of a historically significant building. The building shall be treated respectfully. Existing conditions are to be carefully respected and no material or element shall be removed or disfigured unless specifically indicated on the Drawings, specified herein, or directed by the Engineer/Consultant.

1.5 SUBMITTALS/MOCKUPS

A. Product Data: Manufacturer's product literature for all specified products.
B. Qualifications: Restorer shall submit qualifications, including years of experience and list of similar projects.
C. One Window Frame and sash shall be completed as a mock-up, reviewed and approved prior to the completion of any additional windows.

D. One complete vent assembly including a restored vent, new exterior vent and interior translucent panel shall be created as a mockup, reviewed and approved prior to the completion of any additional units.

1.6 QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced**,** preapproved window restoration firm to perform work of this Section. Firm shall have completed work on buildings and materials similar in age (mid-19th century), material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard wood windows is not sufficient experience for historic wood window restoration work. The firm must have a minimum 5 years of successful completion of this type of work. Individuals who are lead and journeyman level carpenters, millworkers, craftsmen who will actually perform the work on this site and the main house and smoke house must also have a minimum of 5 years of successful completion of this type of work. Vitaes/resumes must be submitted for the firm and each worker who will perform work on the windows and doors of the main house and smoke house.

1. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisor (s) on Project site during times that window/door restoration, painting and cleaning work is in progress. Supervisor(s) shall not be changed during Project except for causes beyond the control of restoration specialist firm.
2. Restoration Worker Qualifications: Provide persons who are experienced and specialize in restoration work of types they will be performing per above written Restoration Specialist Qualifications.

1.7 REGULATORY/SAFETY REQUIREMENTS

A. Existing wood window sash and trim are assumed to contain lead-based paint. Conform to local and federal codes and regulations for the protection of workers and the handling and disposal of the lead containing paint residue from interior trim pieces.

B. If local, state or federal regulations require wholesale removal of lead coated materials, consult with the Consultant/Architect concerning mitigation efforts.

1.8 DELIVERY, STORAGE AND HANDLING

A. Protect materials from the weather. Store materials a minimum of 6 inches above ground on framework or blocking and protect with waterproof covering allowing for adequate air circulation and ventilation. Do not store materials in damp portions of the building.

1.9 PROJECT CONDITIONS

A. Do not perform wood consolidation and epoxy repair work when air temperature is below 60 degrees F.

B. Wood to be consolidated must be dry and have a moisture content below 20% by weight. Protect area from moisture until epoxy has completely cured.

C. Epoxy consolidant and epoxy patching material must be within a temperature range of 50º to 90º F at the time of application. Wood within 3 inches of the consolidation and patching area must be within the temperature range of 45º-90º F at the time of application. Area consolidated and/or patched must not be subjected to freezing temperatures within 24 hours of application. Shade mixing and application areas from direct sunlight. Provide shade to application area for a minimum of 8 hours following consolidation and/or patching of the affected area.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Epoxy Wood Consolidant: Low viscosity two-part penetrating epoxy resin wood consolidant, which has regular and proven use for consolidation applications in decayed wood and which is slow curing (3 to 5 days) to allow for maximum penetration and successive applications. When fully cured epoxy must be more flexible than wood.

B. Epoxy Manufacturers:

1. West System, Gougeon Brothers
   www.westsystem.com
2. Total Boat Epoxy and Polyester Resins
   www.totalboat.com

C. Epoxy Patching Material: Non-structural, flexible, epoxy system for filling cavities, voids and surface imperfections in wood. When fully cured epoxy must be more flexible than wood. Provide suitable product by Gougeon Brothers, or approved equal.

D. End Grain Sealer

1. ANCHORSEAL End Sealer for Logs and Lumber (Winter Formula)
   www.uccoatings.com

E. Wood Products for Restoration of Sills and Jambs

1. No entire sills were observed during a brief field examination that needed to be replaced. There were pieces that will need to be restored.

2. For replacement pieces, and if any sills do need to be totally replaced, use only locally provided, dry, American Black Walnut. No other wood will be accepted.
3. Use only solid, black walnut heart wood. No white wood will be accepted.
4. Use only clear wood with maximum small dime sized knots allowed if they are tight and full.
5. Black walnut wood pieces must be dry measuring less than 19% moisture content by weight.

F. Products for Weatherstripping

1. Barbed -Pile (1/8") Weatherstripping, Advanced Repair Technology www.advancedrepair.com
2. Wood Double Hung Weatherstripping, Blaine Window Hardware, Inc. www.blainewindow.com, WS0100 for sills and WS0103 for tracks, appropriately sized. Order and use on lower operable sash only. No meeting rail or upper sash metal weatherstripping to be used.

G. Products for Preparation of Existing Wood for Painting:

1. Sandpaper: Garnet, 60 to 120 grade.
2. Tools:

   a. Paint scrapers, putty knives, and electric vibrating sanders.
   b. The use of belt sanders is not allowed.

3. Wood Filler: Painters Wood Filler or DAP "33" glazing compound are both accepted wood fillers for the proposed work. Plastic wood filler or wood putty as selected by the Contractor different from above two mentioned products must be approved by the Engineer/Consultant.

H. Paint: Paint specified in this Section is based on products manufactured by Benjamin Moore Company, except where specifically noted otherwise. Other manufacturer's products may be used provided they are approved as equals. Paint products shall be fresh and well ground; shall not settle readily, cake, or thicken in the container; shall be broken up readily with paddle to a smooth consistency; and shall have easy application properties. Other materials such as linseed oil, turpentine, mineral spirits, miscellaneous thinners, varnish, and shellac shall be the highest quality of an approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. A brief, visual, field examination of the windows, frames and sills was conducted in preparation for these specifications. No serious deterioration was noted except in a few locations. It is anticipated that almost all headers, side jambs, sills and sash components

are restorable in-situ. Except for windows 104-107, no headers, side jambs or sills will be removed from their original positions, shop restored and replaced. All work will be performed on site with all components remaining in place during the restoration process for each opening. Only the sash may be removed from the openings, restored on site and replaced in their original openings.

B. Carefully, using a sharp pointed tool, lightly prod headers, side jambs and sills exposed to the exterior for punky, deteriorated or otherwise damaged wood.

C. While the entire enclosing frame around each window opening is to be examined, areas of particular concern will be the headers, lower side jamb ends where they meet the sills and all parts of the sills and sub-sills.

D. Write a report listing all damaged areas found on all window openings and all repair techniques Contractor proposes for the restoration of headers, jambs, sills and sash.

E. Do not proceed with restoration of the window openings until the report and restoration procedures have been approved in writing by the Engineer/Consultant.

3.2 REMOVALS

A. If present, remove all lead coatings per local, state and federal regulations. If regulations call for removal of wooden components, consult with Engineer/Consultant prior to any work. Work through Engineer/Consultant for work mitigation program to be approved in writing prior to starting any lead paint removal.

B. Label sash to be repaired and reinstalled with window opening number to ensure that sash is reinstalled in original openings.

C. No removal of existing sills, frames, and other items is indicated on the Drawings and will not be permitted unless specifically authorized in writing prior to removal of any component by the Engineer/Consultant.

3.3 REPAIR OF EXISTING WINDOW FRAME AND SILLS

A. Carefully remove rotted and/or deteriorated wood from all window components. The determination of which areas of wood are rotted/deteriorated shall be made based on the Contractor's expertise and craftsmanship. However, the Owner's representative reserves the right of final determination of which areas of existing wood are sufficiently rotted and/or deteriorated to warrant removal.

B. Rotted/deteriorated wood is to be removed only to the extent solid wood is achieved in the remainder of the wood component to which new wood pieces can be attached to fill out the remaining component.

C. Rebuild damaged/deteriorated wood by reinforcing deteriorated wood using epoxy wood consolidant followed by the replacement of missing material using epoxy patching material or, if a large piece is missing, the introduction of a new Black Walnut replacement piece custom made to fill in the missing area. Use consolidant, patching materials and/or wood replacement pieces in strict accordance with manufacturer's instructions. The final patch must match the plane, profile and shape of the adjoining material. Keep epoxy consolidant and epoxy patching material out of direct sunlight and at temperatures above 60º F. until fully cured.

D. Replace sections of damaged, deteriorated, or missing wood. Treat all end cuts of new wood where the ends will not be glued or epoxy coated with AnchorSeal wax coating to seal the end grain.

E. Any new or old wood components where end grain is bare, liberally coat end grain with AnchorSeal. AnchorSeal is a waxy, liquid product used to seal end grain to prevent moisture migration into and along wood grain.

F. After repairs have been completed, prepare wood for reinstallation and finishing. Remove loose paint on existing surfaces to sound surface using hand scrappers only. Do not use chemical or heat removal methods; total removal of sound paint coating is not required. Sand surfaces to sound paintable surface by hand or mechanical vibrating sander only. The use of rotary disk sanders will not be permitted. Feather rough paint layer edges by sanding, and clean surfaces of dust.

3.4 REPAIR/RESTORATION OF WOOD SASH

A. Carefully remove all sash.
B. Remove all broken glass and deteriorated glazing.
C. Glue all sash where loose making sure to retain the proper shape for it to be refitted into its original location. Caution: This may not necessarily be a square shape. Check frame opening.
D. Repair/restore muntins where broken, damaged or missing. Maintain original profiles and sizes.
E. Replace broken glass to match the type and thickness of what was removed.
F. Clean glass on both sides.
G. Install new glazing where old glazing was removed.
H. Glazing is to be clear of the "sight line" of the muntins. Glazing that extends beyond the muntin into the visual glass area will be removed and replaced to be even with the muntin edge.

3.5 SASH REINSTALLATION

A. Reinstall restored sash, taking care to install each sash in its original location.
B. All sash units shall be fixed in place.

3.6 WEATHERSTRIPPING

A. Windows are not operable and are therefore required to be restored to a weathertight condition and sealed shut.

3.7 PAINTING APPLICATION, GENERAL

A. Examine surfaces and conditions to which this work is to be applied and notify Contractor if conditions or surfaces exist which are detrimental to the proper application of the work. Starting on the work will imply acceptance by the Painting Contractor of the surfaces and conditions to perform the work as specified.

B. Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
2. Provide finish coats that are compatible with primers used.

C. Apply paint in accordance with manufacturer's instructions. Apply material evenly without runs, sags, or other defects. Leave moldings, trim, ornaments, edges, and millwork clean and true to details without excess paint in corners or depressions. Delete first subparagraph below if casework is prefinished.

D. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

E. Application Procedures: Apply paints and coatings by brush. Use of spray painting equipment is not allowed. Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.

F. Minimum Coating Thickness: Apply paint materials no thinner than manufacturers recommended spreading rate.

1. 2-Coat Work: Provide a total dry film thickness of not less than 3.5 mils for the entire coating system of prime and finish coats.

2. 3-Coat Work: Provide a total dry film thickness of not less than 5.0 mils for the entire coating system of prime and finish coats.

3.8 PAINT SCHEDULE

A. FINISH NO. 1. Painted Wood Windows: Includes sash, sills and frames.

1. Gloss Oil Base Finish, two finish coats over primer.

a. Primer: BM 100-00, Fresh Start Oil-based Penetrating Primer
b. 1st Coat: BM 309-01, Latex High Gloss.
c. 2nd Coat: BM 309-01, Latex High Gloss.

3.9 PROTECTION AND CLEANING

A. After painting has been completed, painting contractor is to return to the site once a week for four weeks and work all windows to prevent them from sticking and freezing in place. All windows will work freely in their openings after paint coats have been applied and hardened.

B. Before, during, and after installation and repair, protect finishes and surfaces of materials in place. Do not remove protection until final cleaning operations.

C. Replace glass that is broken, cracked, or damaged during the installation process and clean on both sides. Glass shall match existing in appearance, thickness and color.

END OF SECTION 085550 – Wood Window and Vent Restoration

SECTION 08700 - Finish Hardware

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Provide hardware for all existing and new doors as called out for this job.
2. All locks shall be master keyed.

B. Related Work Specified Elsewhere

1. Installation of finish hardware: Section 06200
2. Metal Saddles: Section 05500
3. Hollow Metal Doors & Frames: Section 08100
4. Wood Doors: Section 08200

1.02 QUALITY ASSURANCE

A. Codes and Regulations - Work specified in this Section shall conform to all regulations of Local, State and Federal authorities having jurisdiction, including safety, health and antipollution requirements, and Rules and Regulations for access for physically challenged persons in effect at the time of execution of the Contract.

1.03 SUBMITTALS

A. Samples

1. Submit one sample of each of the following items of Finish Hardware to the Architect for approval of quality, design and finish, together with Hardware Schedule: typical finished hinge, typical lock with cylinder and trim, surface closer. Samples shall be returned to Contractor upon approval.

B. Hardware Schedule

1. Submit a complete Schedule of Finish Hardware for approval by the Architect.

2. Each item listed shall be in accordance with the Specification and approved samples.

3. List door numbers or other door identification as indicated on drawings of Door Schedule.

4. Each set of Hardware shall be identified with the appropriate set number listed hereinafter.
5. Identify the side of the door, for each opening, which will receive the cylinder.

6. Identify on which side of the door the surface closer will be installed.

7. Each item listed shall be identified with respect to:

    a. Manufacturer
    b. Brand
    c. Model number
    d. Material
    e. Finish
    f. Dimension and size
    g. Operation
    h. Fire label and other UL label information
    i. and all other information required to fully describe its location, function and use on the door and building.

8. The Architect will check the Hardware Schedule for quality and types only.

9. Submit copies of catalog cuts for all Hardware scheduled.

10. Supply copies of the final approved Hardware Schedule to the Architect and all affected trades.

C. Shop Drawings

1. Submit Shop Drawings for any hardware that is not a cataloged item, or any item that required modification.

2. Shop Drawings shall indicate name of manufacturer, size, methods of manufacturing and fastening, material and finishes.

1.04 TEMPLATES

A. After approval of Hardware Schedule by Architect, furnish template information to fabricators of items of work to which Finishing Hardware is to be applied.

1.05 KEYING SCHEDULE

A. Develop Keying Schedule for entire Project in cooperation with the Owner and the manufacturer of keying system.

B. Keying Schedule shall contain all information with regard to keying system, master keying, numbering of keys, etc.

C. Keying Schedule shall be submitted to the Owner and Architect for approval .

1.06 PACKAGING, DELIVERY AND STORAGE

A. Pack Finish Hardware in heavy duty containers, complete with all accessories, bolts, screws, washers, etc., as necessary to protect and secure them. Store hardware in a clean, dry and safe place.

B. Finish Hardware shall be individually wrapped and protected in such a manner that no marring or damage to finish will be possible.

C. Deliver hardware in the order required and in ample time to permit installation at the schedule time.

D. Keying: All locks shall be keyed as directed. Master keys and change keys shall be delivered directly to the Owner by the Contractor personally or by certified mail.

1.07 WARRANTY

A. In addition to the Warranty provisions of the General Conditions, the Contractor shall warrant the work provided under this Section to be free from defects in materials and workmanship for a period of two years from the date of final acceptance by the Owner, except door closers shall be warranted for five years.

B. Should any defects develop during the warranty period, the Contractor shall upon written notice from the Architect or Owner replace or satisfactorily repair such defects including adjustments to adjacent work, at the convenience of and without expense to the Owner.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Finish Hardware for fire-rated doors and frames shall conform to the applicable requirements of the American Insurance Association and the National Board of Fire Underwriters Laboratories, Inc., indicating its conformity with such requirements for use in connection with its specified location.

B. Exposed screws shall have countersunk oval heads (Phillip's), except screws for butt hinges, lock faces and strikes which shall have flat head countersunk heads. All countersunk screws shall fit hole properly.

C. Bolts, screws and other fastenings required for the application of the Finish Hardware shall be of size and type requirements and shall be of same material and finish as the exposed parts of such hardware which they adjoin. Use stainless steel screws with aluminum parts.

D. Surface-mounted closers shall be mounted on the room side or generally on the less important side of the door. Use parallel arm closer where necessary to achieve this.

E All hollow metal doors called out to receive cylindrical locksets shall be provided to the job with added latch reinforcement.

F. Through-bolts shall be avoided; if not possible, exposed bolt ends shall be provided with cap nuts.

G. Locks shall have beveled or rounded faces as required by door construction.

H. When door stiles are too narrow for standard back-set of lock specified, special back-set shall be furnished.

2.02 ACCEPTABLE PRODUCTS AND MANUFACTURERS

A. Only manufacturers hereinafter specified and only the products from the manufacturer's specified series or equals approved by the Architect shall be used for the work of the Section.

B. If no specific product is specified, the item shall be by the specified manufacturer as approved by the Architect.

2.03 HARDWARE

A. All finishes shall be uniform in color and texture, free from blemishes and other imperfections, and shall match the approved sample.

B. Finish for Closers: Unless otherwise noted, finish for closers shall be compatible with finish of locks.

C. All locks shall be furnished with cylinders to accept interchangeable cores. Provide construction cores during construction to secure building. Install new cores at end of project as per keying schedule. Campus standard is Schlage.

D. Provide blocking in walls for door stops and other hardware anchored to wall.

2.04 HARDWARE SCHEDULE

A. Manufacturers' Reference

1. Hinges	Rockwood, Bommer
2. Locks/Latches	Corbin Russwin, Schlage
3. Closers, Patches	Dorma, Norton
4. Floor Stops, Silencers, Flush Bolts	Rockwood, Glynn Johnson
5. Weatherstripping, Threshold	Reese
6. Push/Pulls, Protection Plates	Rockwood

B. Finishes Reference

USP	Prime Coat for Painting
US10	Bronze
US15	Brushed Nickel
US32D	Stainless Steel
US26D	Satin Chrome Plated Steel

C. Hardware Sets

Set #1 – Interior Board Door (D102) EACH SET TO HAVE

1 Pair	HD T Hinges	National N129-213 Extra Heavy, Black, 8", V286	
1	Spring Hinge	McKinney 1502 4.5" x 4.5"	Black
1	Cylindrical Lock	ND70PD-R-ATH	Black
	Weatherstripping	Reese 632 (perimeter)	

Set #1A – Ext Exit Board Door (D106, D109) EACH SET TO HAVE

1 Pair	HD T Hinges	National N129-213 Extra Heavy, Black, 8", V286	
1	Spring Hinge	McKinney 1502 4.5" x 4.5"	Black
1 Pair	Exit Device	ED4200 x 36 x 10B LT LC	Black
	Weatherstripping	Reese 632 (perimeter)	

Set #2 - Entry Glass Doors (101B) EACH SET TO HAVE

1 Pair	Offset Pivots	Tubelite standard	DB
1 Pair	Exit Device	ED4800 x 36 x 10B LT LC	US10
1 Pair	Rim Cylinder	Schlage 7 pin IC	US10
1	Threshold	Reese (4" x Full Width)	US10
1 Pair	Pulls	CR 12	US10
1 Pair	Closer	Dormakabba RTS88	DB
	Weatherstripping	Tubelite	

Set #3 – Kitchen (D115) EACH SET TO HAVE

1	Center Pivots	Bommer 7813	640
1 Pair	Push plates	Rockwood 4 x 10	640
1 Pair	Kickplates	Rockwood 35 x 10	640

Set #4 – Kitchen Exit (D117) EACH SET TO HAVE

1	Butt Hinge	4.5x4.5	US10B
2	Spring Hinges	4.5x4.5Adjustable	US10B
1	Entry Lock	L9453-R-07	US10B
1	Kick Plate	J102	
1	Floor Stop	L0212x 3 FASTENERS	
1	Door Sweep	321 CN x TEC	
1	Threshold	171 A x Hcp x MS/DB	
	Weatherstripping	Reese 632 (perimeter)	

Set #5 - Entry Glass Doors (D204, D205) EACH SET TO HAVE

1 Pair	Offset Pivots	Tubelite 180º action	DB
1	Lockset	Schlage ND75PD-R-ATH	US10B
1	Dummy Pull	Schlage -ATH	US10B
1 Pair	Flush Bolts	Ives, top & bottom	US10
1	Threshold	Reese (4" x Full Width)	US10
1 Pair	Closer	Dormakabba RTS88	DB
	Weatherstripping	Reese 632 (perimeter)	

Set #6 – Interior Board Door (D206, D207, D208) EACH SET TO HAVE

1 Pair	HD T Hinges	National N129-213 Extra Heavy, Black, 8", V286	
1	Spring Hinge	McKinney 1502 4.5" x 4.5"	Black
1	Thumb Latch	B&B V19-047	Black
1	Privacy Slide Bolt	B&B (D206 only)	Black

Set #7 - Toilet (D116, D214) EACH SET TO HAVE

1/2 Pair	Butt Hinges	McKinney TA2314 4.5" x 4.5"	US10B
1 Pair	Spring Hinges	McKinney 1502 4.5" x 4.5"	US10B
1	Lockset (privacy)	Schlage ND40S-ATH	US10B
1	Floor stop	Rockwood 409	US10B
1	Weatherstripping	Reese 632 (perimeter)	

Set #8 – Bathrooms (D209, D210) EACH SET TO HAVE

1/2 Pair	Butt Hinges	McKinney TA2314 4.5" x 4.5"	US10B
1 Pair	Spring Hinges	McKinney 1502 4.5" x 4.5"	US10B
1	Push/Pull	Rockwood 4 x 12	US10B
1	Floor stop	Rockwood 409	US10B
1	Weatherstripping	Reese 632 (perimeter)	

Set #9 – Utility Room (B01, B02, B03, D211) EACH SET TO HAVE

1/2 Pair	Butt Hinges	McKinney TA2314 4.5" x 4.5"	US10B
1 Pair	Spring Hinges	McKinney 1502 4.5" x 4.5"	US10B
1	Lockset	Schlage ND80PD-R-ATH	US10B
1	Floor stop	Rockwood 409	US10B
1	Kickplate	Rockwood 10"	640
1	Mop plate	Rockwood 10"	640
1	Weatherstripping	Reese 632 (perimeter)	

Set #10 – Stairwell (D113) EACH SET TO HAVE

1/2 Pair	Butt Hinges	McKinney TA2314 4.5" x 4.5"	US10B
1 Pair	Spring Hinges	McKinney 1502 4.5" x 4.5"	US10B
1	Lockset	Schlage ND73PD-R-ATH	US10B
1	Kickplate	Rockwood 10"	640
1	Mop plate	Rockwood 10"	640
3	Silencers	Ives	

PART 3 - EXECUTION

3.01 INSTALLATION

A. See Section 06100 - Rough Carpentry

3.02 DISPOSAL OF DEBRIS

A. All material, debris and rubbish resulting from this alteration work: Clean up, remove from the building and site as it is removed and legally disposed of. Leave all areas of work in "broom clean" condition.

END OF SECTION 08700

SECTION 08800 - GLASS & GLAZING

Part 1 - General

1.01 Description

A. Work of this Section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Glass for storefront.
2. Glass for doors.
3. Glass for interior windows.
4. Glass for exterior windows.

B. Related Work Specified Elsewhere

1. Rough Carpentry: Section 06100
2. Sealants: Section 07900
3. Hardware: Section 08700

1.02 Quality assurance

A. Design Criteria

1. Each installed glass light is to have affixed stickers indicating glass type as per schedule and stating manufacturer's labeled glass product name and thickness.

2. The bite on each glass edge shall conform to the requirements and recommendations of the glass manufacturer and the applicable reference standards cited herein.

3. Unless otherwise noted monolithic, glass shall have their edges clean cut in approved manner conforming to requirements and recommendations of the glass manufacturer.

B. Reference Standards

1. Federal Specifications (Fed. Spec.)
2. American National Standards Institute (ANSI)
3. Flat Glass Manufacturer's Association '%FGMA)
4. American Society for Testing and Materials (ASTM)
5. National Association of Architectural Metal Manufacturer's (NAAMM)
6. Architectural Aluminum Manufacturer's Association (AAMA).
7. Insulting Glass Certification Council (IGCC)
8. Sealed Insulating Glass Manufacturer's Association (SIGMA)

1.03 SUBMITTALS

A. Submit three (3) each of the following to Architect for review prior to delivery-and installation.

1. Glass - 12" x 12", each type and kind
2. Setting spacers and blocks - actual
3. Storefront frame and finish
4. Elevations of storefront system, windows, and doors

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type, manufacturer and brand. Delivered materials shall be identical to approved samples.

B. Factory label each glass light. Labels shall not be removed until after the installation has been approved.

C. Remove glass that is cracked, broken, chipped, or otherwise damaged from the job site and replace with new material. Glass surfaces which display streak lines or other imperfections will be considered unacceptable and shall be replaced.

D. Store glass in clean, cool, dry areas with interleaving protection. If it is necessary to store glass outside, tarpaulin or plastic protection must be used. Never store glass in direct sunlight without an opaque protective covering.

E. If glass must be stacked, do so at an angle of 5 degrees to 7 degrees from vertical and continuously protect the top and bottom edges with felt (and separate and protective paper) Stacking of insulated glass must be on tapered blocks so as to prevent shear action between front and back lights.

F. Never pick up glass panels without protective gloves.

G. Do not slide one light of glass over another.

Part 2 - PRODUCTS

2.01 GLASS TYPES (General Standards)

A. Glass: approved domestic manufacture conforming to the applicable requirements of Federal Specification DD-G-451 for Flat Glass for Glazing, Mirrors and other uses, and DD-G-001403 for heat strengthened and fully tempered glass. Glass shall be Type 1, Class 1, quality 3.

B. Tempered glass shall conform to ANSI Z97.1/4 and shall be cut to shape and size before tempering, and shall not be cut or trimmed after tempering. Grind edges of tempered glass lights.

Acceptable Glass Manufacturers

1. PPG Industries
2. LOF

3. Hordis Bros. Inc.
4. ASG Industries, Inc.

2.02 GLASS SCHEDULE

A. Glass Type 1: Transparent 1" insulated Low-E, 1/4" tempered, 1/2" airspace.
   1. Aluminum windows.
   2. Storefront system

B. Glass Type 2: Transparent 1/2" insulated Low-E & tempered glass.
   1. Glass in doors

C. Glass Type 3: Transparent 1/4" tempered glass.
   1. Interior windows
   2. Interior doors

2.03 GLASS SETTING MATERIALS

A. Neoprene Setting Materials for Interior Glazing

   1. Neoprene materials: extruded high quality ozone resistant, cured, elastomeric, virgin neoprene compounds with Shore A durometer hardness, profiles and design parameters, length and locations as required and recommended by the approved glass manufacturer(s). Exposed channels and gaskets shall have smooth neat exposed profiles conforming to approved profiles.

      a. Dense (solid) neoprene: AAMA SG-I

   2. Setting blocks used to support the dead load of the glass: extruded in a neoprene conforming to NAAMM Standard SG-1 with a Shore A durometer hardness of between 80 and 90. Length of each block: 0.1" for each square foot of glass area but not less than 4" in length. Width: 1/16" less than-full channel width and high enough to provide minimum edge clearance for the glass.

   3. Shims (edgeblocks) used to center and station the glass: extruded in a neoprene compound conforming NAAMM Standard SG-1 with a Shore A durometer hardness of between 60 and 70. Not less than 3" in length and sized to allow a nominal 1/80 clearance between the edge of the glass and the shim.

2.04 MANUFACTURER

A. Manufacture glass lights to proper sizes and thicknesses, from measurements taken at the project.

B. Glass lights shall have "clean cut" and/or custom factory edges conforming to manufacturer's recommendations.

C. Manufacturer tempered or laminated units to exact sizes for each opening. Discard, remove and replace over and/or undersize units with proper fitting glass units of same type.

D. Heat-soak tempered glass after tempering in an autoclave 425F. for a minimum of four (4) hours.

E. Glazing Compound by DAP or equivalent.

Part 3 - Execution

3.01 INSPECTION

A. Examine surfaces and conditions to which this work is to be attached or applied, and notify the Architect if conditions exist which are detrimental to the proper and expeditious installation of the work. Starting on the work shall imply acceptance of the surfaces and conditions to perform the work as specified.

B. Verify dimensions taken at the job site, affecting the work. Field dimensions which are at variance are to brought to the attention of the Architect. Obtain decision regarding measures to be taken before the start of installation of items affected.

C. Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.

D. Verify all glass sizes and clearances.

3.02 PREPARATION

A. Clean and prepare glazing rabbets so that they are clean, dry and free of materials that might adversely affect the bond and seal of the glazing materials or of the proper drainage of the rabbet.

B. Protect adjoining surfaces not to receive glazing materials against staining or damage.

C. Install glass and glazing materials under the climatological conditions recommended by the manufacturers.

3.03 INSTALLATION

A. Perform glazing using skilled workmen familiar with materials, methods and details noted herein, and in accordance with the best trade practices, without spring or forcing. Follow instructions of the glass and glazing materials manufacturers.

B. Glass and glass setting materials shall be compatible with each other and adequate for their intended purpose.

C. The minimum bite of glass shall be as follows unless otherwise noted or recommended by the glass manufacturer:
Under 50 united inches - 1/4"
50 to 100 united inches - 3/8"
Over 100 united inches - 1/2"

D. Setting blocks: not less than 4" long, by 1/16' less than full width of glass and of a height to permit a proper glass bite as recommended by the approved glass manufacturer and/ or as noted herein. Place two setting blocks at the glass quarter points for each light of glass.

E. Install spacer shims on 24" centers around the perimeter of each glazed opening with not less than two spacers per side. Locate in the vertical channels.

F. Set glazing to be free from rattle and strain, and centered in each opening providing the purchases and clearances required. Tong marks of tempered glass units shall not be visible in the finished work.

G. Do not remove labels from the glass until inspected in location by the Architect.

H. Install identification or markers after glass has been set. Identification or markers shall not be placed directly on the glass surfaces, but placed across the windows with ample space for air movement between markers and glass.

I. Apply silicone neatly around perimeter of floor glazing for max. acoustical performance.

J. Steel Windows: Replace damaged sections that can not be repaired. Use liquid metal compounds where feasible to build up and repair sections of rusted or damaged frames. Weather strip operable sashes. For back bedding and face glazing: ASTM C669.

3.04 PROTECTION AND CLEANING

A. Protection glass in transport and during construction, taking all normal Precautions against breakage. After installation, mark glazed opening with streamers or other means to reduce possibility of damage by other trades. Do not mark glass with compound of any type.

B. When glass is installed adjacent to or below concrete or masonry surfaces, examine regularly during construction and clean immediately when, concrete dirt or deposits appear.

C. This trade Contractor shall be responsible for damage to, or breakage of work cause by his operations during delivery and installation. After installation and initial inspection, the General Contractor shall be responsible for protection of the work until final acceptance.

D. Replace broken, cracked or chipped glass with new and identical material, as approved and/or directed by the Architect. (not applicable).

E. Before final acceptance remove the protecting materials and clean surfaces of dirt smears, paint spots, mortar and other extraneous materials from both sides of each pane of glass, at all interior and exterior locations.

END OF SECTION 08800

SECTION 092500 - Gypsum Drywall

Part 1 - General

1.01 Description

A. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Wall surfaces and wall framing, furring, etc.
2. Ceiling surfaces and ceiling framing, furring, etc.
3. Insulation in walls and ceilings.
4. Related fasteners and miscellaneous appurtenances.

B. Related Work Specified Elsewhere

1. Installation of doors: Section 06100
2. Hollow Metal: Section 08100
3. Painting: Section 09900
4. Structural Light Gauge Framing: See notes on structural drawings.
5. Acoustical Ceilings: Section 09510

1.02 Quality assurances

A. Codes and Regulations

1. Work specified herein shall conform to all applicable State and Local codes and regulations having jurisdiction.

2. Where fire resistive ratings are required for work of this section, the gypsum drywall assemblies shall be installed in strict accordance with the Underwriters Laboratory requirements.

1.03 SUBMITTALS

A. Product Literature

1. Submit product, catalog cuts and data sheets from the proposed furring and lathing manufacturer.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the site, ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Delivered materials shall be identical to approved samples.

B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.

Part 2 - PRODUCTS

2.01 GYPSUM DRYWALL

A. Gypsum drywall shall conform to Fed. Spec. SS-L=30c and ASTM C-36, with tapered edges, in thickness noted on drawings. Gypsum backing board shall conform to ASTM C-442.

B. Gypsum drywall shall be type "X" and type "XX" (C) manufactured especially for fire resistance with a core formulated from special mineral materials, and shall conform to ASTM C-707.

C. Water resistant gypsum boards: 5/8" thick, Firecode C Core, compliant with ASTM C630, 48" wide and beveled.

2.02 FURRED FRAMING MEMBERS

A. Furring channels shall consist of 25 gauge electro-galvanized "Hi-Hat" and "Z-type", manufactured of galvanized steel, "Z-Type", used at masonry and concrete walls and "Hi-Hat Type" used where indicated on the drawings.

2.03 HUNG CEILING FRAMING MEMBERS

A. Hangers: 1" x 3/16" steel painted flats or 1/4" diameter adjustable rods. Provide top and bottom attachment fittings as required.

B. Tie wires for securing main runner channels and attaching cross furring to main runners shall be No. 16 gauge galvanized annealed steel wire. Furring channel clips where used, shall be galvanized, made especially for the purpose.

C. Main runners: 1-1/2" cold rolled, painted steel, 16 gauge channels weighing not less than 500 pounds per 1000 linear feet.

D. Furring channels: rolled formed hat-shaped galvanized steel section, 7/8" depth weighing not less than 285 pounds per 1000 linear feet.

E. For condition where ceiling is concrete, provide "hook and budge" method of suspension.

1. Hooks: 1/8" x 1" straps hooked over existing reinforcing of concrete floor.

2. Bridges: 1-1/2" hot rolled channels weighing .85 lbs. per linear foot spanning between beam haunches.

2.04 INSULATION

A. Insulation within partitions: sound attenuation blankets consisting of a paperless, semi-rigid mineral fiber mat, or glass fiber conforming to thickness noted on the drawings, having a density of not less than 3 lbs. per cu. ft.

B. Insulation shall conform to Fed. Spec. HH-I-521e, Type 1, Class A and have a fire hazard classification in accordance with ASTM E-84 as follows: flame spread-25; fuel contributed-20; smoke developed-0.

2.05 MISCELLANEOUS ACCESSORIES

A. Metal accessories shall consist of corner beads, stops, edge trim, casing beads and control joints and other accessories as required conforming to proper profiles and sizes to accommodate drywall partition components encountered. Accessories: formed of galvanized or cadmium plated steel. Hot dip galvanize (ASTM A-525).

1. For terminations, provide USG series 200 casing beads (J-molding is not acceptable).

B. Screws for securing drywall and accessories in place: self-drilling, self-tapping, Phillips head steel screw, designed for power tool attachment. Length and type of screw as recommended by the manufacturer of the partition system and by conditions encountered in the field. The use of nails for application will not be permitted. Screws shall conform to ASTM C-646.

C. Joint and recess fastener treatment: a three (3) coat application as recommended by the approved drywall manufacturer for partition types noted and conditions encountered in the field.

D. Laminating adhesives for mult-layer applications: as recommended by the approved drywall manufacturer for partition types noted and conditions encountered in the field.

2.06 ACOUSTICAL SEALANT

A. Acoustical sealant: a highly elastic, non-bleeding and non-staining pump type sealant which shall remain permanently flexible, formulated especially for this type of application and manufactured by one of the following:

1. U.S. Gypsum
2. Tremco, Inc.
3. Miracle Adhesives
4. Or an acceptable equal

2.07 ACCEPTABLE DRYWALL MANUFACTURERS

A. U.S. Gypsum (US origin)
B. National Gypsum/Gold Bond (US origin)
C. Georgia Pacific (US origin)
D. Or an equal acceptable to Architect.

Part 3 - Execution

3.01 INSPECTION

A. Study the contract and specifications with regard to the work as shown and required under this section so as to insure its completeness.

B. Examine the surfaces and conditions to which this work is to be attached or applied, and notify the Architect if conditions or surfaces exist which are detrimental to the proper and expeditious installation of the work. Starting on the work shall imply acceptance of the surfaces and conditions to perform the work as specified.

C. Verify dimensions taken at the job site, affecting the work. Bring field dimensions which are at variance to the attention of the Architect. Obtain decision regarding corrective measures before the start of installation.

3.02 WORKMANSHIP

A. Install materials and partition systems specified herein and as indicated on the drawings in strict accordance with the printed directions and/or specifications of the aproned manufacturer to attain fire ratings noted on the drawings.

B. Apply drywall with the reverse side against the framing members, and with the separate panels in moderate contact. In no case shall be panels be forced into place. At interior and exterior corners, conceal the cut edges of the panels by overlapping them with the abutting boards. Stagger panels so that the corners of any four panels will not meet at the same point. Vertical joints shall not occur on the same stud on both sides of a partition. Apply panels in such lengths that will result in a minimum of joints.

C. Building into drywall partitions reinforcing plates of not less than 3/16" thick, to accommodate items which will be secured on and/or hung from the drywall partition, with control joints, spaced not over 30 feet o.c. Verify control joint locations with the Architect prior to installation.

3.03 FRAMING FOR FURRING

A. Install studs in all cases in one piece from noted floor location to underside of the encountered structure or to horizontal termination member.

B. When drywall panels are not scheduled to go on the underside of the structure provide an additional horizontal stud member at the point above the ceiling line where the drywall panels are terminated. Brace to underside of slab above with every other stud in addition to diagonal bracing at same spacing.

C. Locate double studs not more than 2" from all door frame jambs, abutting partitions, partition corners and other construction, and as indicated on the drawings.

D. Provide double studs at jambs of door and window frames and head and sill runners as required to completely frame out these openings.

E. Furring

1. Attach wall furring channels to masonry or concrete surfaces either vertically or horizontally spaced not more than 24" o.c. For channels positioned horizontally, attach a furring channel not more than 4" from both the floor line and the ceiling line.

3.05 GYPSUM WALL

A. Apply drywall with long dimension (parallel) to framing members, with abutting ends and edges occurring over stud flanges. Use panels of the maximum practical length to minimize joints. Fit and stagger end joints. Arrange joints on opposite sides of the partition to occur on different studs. Cut panels to fit outlets, switch boxes and all other items encountered which penetrate the drywall surfaces.

B. For vertical single-layer drywall application, space 1" screws at a maximum of 12" o.c. in the field of the panel and 8" o.c. staggered along the vertical abutting edges.

C. For horizontal single-layer drywall application, space 1" screws at a maximum of 12" o.c. in the field of the panel and 12" o.c. staggered along the vertical abutting end joints.

D. For two-layer job laminated construction, apply the base layer vertically with 1" screws spaced 12" o.c. in the field of the panel and 8" o.c., staggered at the vertical joints of the panel. Apply the face layer vertically with vertical joints, laminate and hold in place with supplemental fasteners until adhesive is dry.

E. For two-layer job construction with screw attachment of the face layer, apply the base layer vertically with vertical joints staggered on opposite sides of the partition and screw-attach with 1" screws spaced 16" o.c. in the field and vertical joints of the panel. Apply the face layer vertically with vertical joints offset 24" from base layer joints and staggered on opposite sides of the partition. Attach with 1-5/8" screws spaced 16" o.c. in the field and vertical joints of the board.

F. Furring all exposed piping, ducts and mechanical and electrical conduits in finished spaces with channel furring and 5/8" thick drywall panels as part of the work of this section.

G. Stagger drywall joints above door openings and not opposite each other on the same stud at door heads. At door jambs secure drywall panels to each stud of the double stud arrangement with screws space 8" on center into each stud.

3.06 ACCESSORIES

A. Install corner beads on all exterior corners in one length without joints and secure with fasteners spaced 9" o.c. on both sides. Corner Beads shall be formed to an angle of 90˚ with 1-1/4" fine mesh flanges.

B. Wherever an end of drywall will remain exposed or cannot be taped, provide continuous casing beads over face layer and secure in place with fasteners space 9" o.c.

C. Provide control joints in the face layer at continuous walls exceeding 30'-0" and where indicated on the drawings, and staple in place in a secure and rigid manner.

D. Drywall abutting dissimilar materials shall terminate in casing beads fastened to terminal stud only.

3.07 INSULATION

A. Install continuous, full height insulation blankets between channel studs. Secure insulation to the back of the drywall on one side.

B. Install insulation behind furred locations where noted.

3.08 ACOUSTICAL SEALANT

A. Apply caulking in continuous beads of 1/4" diameter. Each partition shall receive not less than four (4) beads at top and four (4) beads at the bottom. apply two (2) continuous beads between the floor runner channel and the floor slab, and two (2) continuous beads between the ceiling channel runner and abutting construction.

B. Apply two (2) continuous beads between base layer of gypsum drywall, or single layer of gypsum drywall and the abutting ceiling and floor construction, on each side of every partition.

3.09 TREATMENT OF JOINTS AND FASTENERS

A. Completely fill all joints by the drywall panels and/or adjoining materials with a three (3) coat application of joint cement and tape. Joint treatment compound shall be mixed according to the approved manufacturer's directions.

B. Drive fasteners in slightly below the surface of the board, with heads forming a slight depression below the surface of the drywall. Fasteners shall not be driven closer than 3/8" from edges and ends of boards. Drywall adjacent to the joint of fastening shall be held tightly against the framing members while driving fasteners. Dependence on fasteners to draw drywall against the framing will not be acceptable.

C. All boards shall fit tightly against the supporting frame work before applying joint treatment and concealing screw depressions.

D. Joint Compound and Taping:

1. Mix joint compound in strict accordance with manufacturer's recommendations.

2. Apply taping or embedding compound in a thin uniform layer to all joints and angles to be reinforced. Immediately apply reinforcing tape centered over joint and seated into compound. Sufficient compound - approximately 1/64" to 1/32" - must remain with a skim coat to embed tape, but not to function as a second coat. Fold and embed tape properly in all interior angles to provide a true angle. The tape or embedding coat must be thoroughly dry prior to application of second coat.

3. Apply second coat of joint compound over embedding coat, filling panel taper flush with surface; cover tape and feather out slightly beyond first coat. On joints with no taper, cover the tape and feather out at least 4" on either side of tape. Allow second coat to dry thoroughly prior to application of finish coat.

4. Spread finish coat evenly over and extend slightly beyond second coat on all joints and feather to a smooth finish. Over tapered edges, do not allow finished joint to protrude beyond plane of the surface. Apply a finish coat to cover tape and taping compound at

all tapered angles and provide a true angle. Where necessary, sand between coats and following the final application of compound to provide a smooth surface ready for decoration.

5. For curved surface joints crease tape along center, make scissor cut half way across tape and 3/4" apart to make tape flexible. Apply uncut half to curved surface and fold cut half of tape onto uncurved wall surface.

E. Finishing Fasteners

1. Apply a taping or all-purpose type compound to fasten depressions as the first coat. Follow with a minimum of two additional additional coats of topping or all purpose compound, leaving all depressions level with the plane of the surface.

F. Finishing Beads and Trims

1. Apply first coat to all bead and trim and properly feather out from ground to plane of surface. Compound must thoroughly dry prior to application of finish coat.

2. Apply second coat to all bead and trim, extending compound slightly beyond the first coat and properly feathering from ground to plane or surface.

3. Apply finish coat to all bead and trim, extending compound slightly beyond the second coat and properly feathering from ground to plane or surface. Sand finish as necessary to provide a flat, smooth surface ready for decoration.

4. No exposed plastic edging or beads are allowed.

3.10 PREPARATION FOR FINISHES

A. All exposed surfaces of gypsum drywall which have depressions, gouges, cuts and dimples shall be spackled and sanded to present a smooth level surface acceptable for painting and wall covering by other trades.

B. Spackle openings around pipes, switches and other framed openings.

3.11 Protection and cleaning

A. Promptly remove joint compound from doors, door frames, windows, floors and all other surfaces which are not scheduled to receive the joint compound.

B. At the completion of installation, remove all rubbish, excess material, scaffolding, tools, and other equipment from the building and job site and leave surfaces clean and whole.

END OF SECTION 09250

SECTION 093000 - CERAMIC TILE

Part 1 - General

1.01 Description

A. Work of this Section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Provide new porcelain floor tile as indicated on drawings.

B. Related Work Specified Elsewhere

1. Sealants: Section 07900
2. Plumbing: on drawings

1.02 Quality assurance

A. Manufacturer

Before setting any tiles, furnish to the Architect a certificate of grade, etc. Certificate shall be signed by the manufacturer of the tiles and by the subcontractor for the Work, stating the grade, kind and full quantities of tiles, and give identification marks for all packages of tiles furnished under this Contract.

Brand packages with corresponding shipping marks.

1. Furnish tile of the same manufacturer and from the same origin for each tile type and color.

2. Furnish setting and grouting materials of the same manufacturer and from the same origin for each tile type and method of installation, whenever possible.

B. Qualifications

Installer is to be a firm who has a minimum of five years experience with the installation of specified materials.

1.03 SUBMITTALS

A. Product Data

Submit manufacturers' specifications and installation instructions for the following:

1. Each type of tile and trim units specified.
2. Setting materials specified
3. Grouting materials specified.

B. Shop Drawings

Submit Drawings indicating tile patterns and locations and width of control and expansion joints in tile surface when required by Architect.

C. Samples

1. Initial Selection: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures, and patterns available for each type of tile indicated. Include grout manufacturers standard range of colors for each grout type required.

2. Verification Samples:

a. Samples of each type and color specified

b. Trim units: 2, each type and shape specified.

D. Warranty

1. Submit details of 10 year warranty on shower base products and installation including mud set, thin set and liquid membrane materials.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery and Storage

1. Deliver all materials of this Section to the job site in their original unopened containers with grade seals unbroken and labels intact and legible.

2. Store all materials under cover in a manner to prevent damage and contamination; store only the specified materials at the job site.

B. Protection - Use all means necessary to protect ceramic tile materials before, during, and after installation and to protect the installed Work and materials of all other trades.

C. Replacements - In the event of damage, immediately make all repairs and replacements necessary to the approval of the Project Architect and at no additional cost to the Owner.

1.05 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 injury to persons or damage to tile work from carbon dioxide or carbon monoxide buildup.

C. Maintain temperatures at not less than 50'F. (10'C) in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

1.06 MAINTENANCE MATERIALS

A. General

Deliver stock of maintenance materials to Owner's Representative (to be transferred to the custodian). Furnish maintenance materials from same manufactured lot as material installed and enclosed in protective packaging with appropriate identifying labels.

1. Tile: Furnish not less than one box for each 25 boxes or fraction thereof, for each type, color, pattern and size installed.

2. Wall Base: Furnish not less than 10 linear feet of each type, color, and size installed.

3. Grouting Materials: Furnish 10% stock of premixed, dry-set grout - ANSI A118.6 with color added.

4. Sealants: Furnish 10% stock of silicone rubber type sealant; Federal Specification TT-S-001543, Class A.

Part 2 - PRODUCTS

2.01 MANUFACTURERS

A. Porcelain Tile

1. Stonepeak- Quartzite
2. or approved equal.

B. Mortars, Adhesives and Grout

1. American Olean Tile Co., Inc.
2. Boiardi Products Corp.
3. Cambridge Tile Mfg. Co.
4. Custom Building Products

2.02 MATERIALS

A. Tile Products

1. Glazed ceramic wall tile complying with Section 6.1 ANSI A137.1; Standard Grade.

   a. Standard size: 12" x 24" x 5/16" - unless otherwise specified.

   b. Color Name: Lime (actually a nautral/beige color)

   c. Edges: square edged.

B. Setting Materials

1. Portland Cement Mortar Complying with ANSI A108.1

   a. Portland Cement ASTM C-150 Type 1
   b. Sand ASTM C-144
   c. Hydrated Lime - ASTM C-206 or ASTM C-207 Type S
   d. Water - Clean and potable.

e. Follow recommendations outlined in TCA Handbook for Ceramic Tile Installation for mortar mix proportions.

2. Latex Portland Cement Mortar - Thin-setting bed complying with ANSI A118.4.

a. Prepackaged dry mortar mix incorporating dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site, or latex additive, serving as a replacement for part or all of gauging water, added at job site to dry mortar mix.

b. Follow recommendations outlined in TCA Handbook for Ceramic Tile Installation.

D. Grouting Materials: Use appropriate grout to match existing from the following:

1. Commercial Portland Cement Grout - compound of Portland cement and additives, factory blended to decrease shrinkage and increase moisture resistance, and complying with ANSI A118.6.

2. Commercial Sanded Portland Cement Grout - provide acid resistant grout similar to L&M Acid-R or UPCO Hydroment or approved equal by the Owner.

3. Latex - Portland Cement Grout - compound of Portland Cement grout with latex additive, complying with ANSI A118.6.

4. Colors - General: to be selected by the Architect.

2.03 MIXES

A. Mix mortars and grouts to comply with referenced standards and manufacturers recommendations. Accurately proportion materials for mixing to produce mortars and grouts of uniform quality with optimum performance characteristics.

Part 3 - Execution

3.01 EXAMINATION

A. Surfaces to receive tile shall be firm, smooth, level, plumb and square.

B. Inspect all surfaces prepared by others before starting tile work and report all unsatisfactory conditions to the Owner. Starting tile work shall be considered acceptance of Work of others.

C. Verify that substrate will allow floor tile to slope to drains.

D. Before proceeding with any tile work, verify with plumbing contractor that all waterproofing, sleeves, and pipe flashing have been installed and that all piping systems have been run and tested.

E. Inspect existing wall tile and grout for bond failure, cracks causing loose tiles or grout and holes previously drilled for, bathroom accessories.

3.02 PREPARATION

A. Prepare floors, walls and base substrates for tile installation in accordance with Tile Council of America's recommendations and requirements for wall and floor systems specified.

3.03 INSTALLATION, GENERAL

A. ANSI Tile Installation Standard - Comply with applicable parts of ANSI 108 series of tile installation standards included under American National Standard Specifications for Installation of Ceramic Tile.

B. TCA Installation Guidelines - Comply with Tile Council of America installation methods indicated or, if not otherwise indicated, as applicable to conditions shown.

C. All wall tile shall be laid up with vertical joints not over 1/16" thick, continuous and unbroken in perfect alignment. For tile mounted in sheets, make joints between tile sheets same width as joints within sheets so extent of each sheet is not apparent in finish Work.

D. Tile shall be set to the required levels and planes with true lines and angles. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting

E. Cut edges of tile shall be carefully ground and jointed. Do all cutting and drilling required for setting and as may be required by other contractors in a neat manner without marring the surface. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars, or covers overlap tile.

3.04 WALL TILE INSTALLATION METHODS

A. General - Install wall tile and base to comply with requirements indicated below for setting bed methods, TCA installation methods related to subsurface wall conditions, grout-types and existing work.

1. Commercial Portland Cement Mortar: ANSI A108.1

a. Plaster, cement, and concrete block units; interior: TCA W221, including cement parged leveling roat by installer.

b. Grout: A Portland Cement type grout.

2. Latex Portland Cement Mortar: ANSI A108.5 (Thin set method)

a. Plaster, cement, tile backer board and concrete block units, interior: TCA W202.

b. Grout: Latex-portland cement.

3.05 GROUT APPLICATION

A. Where possible, tile should not be grouted sooner than 48 hours after setting, to permit complete evaporation of solvents in the adhesive.

B. Clean all joints of dust, dirt, and excessive adhesive. Adhesive may be removed with a sharp knife or solvent.

C. When grouting wall tile thoroughly soak all joints with clean water. This is important as grout will not cure properly unless thoroughly soaked.

D. Mix grout with clean water to a consistency of thick cream. Completely fill all joints and allow to set for a few minutes. Remove the surplus grout and finish flush and true. As soon as the grout has reached its initial set, thoroughly wash with a sponge and clean water. Polish with clean, dry cloths.

3.06 CLEANING

A. Upon completion of all ceramic tile installation and grouting, thoroughly clean the exposed surfaces of all ceramic tiles so they are free of foreign matter including grout.

B. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but not sooner than 14 days after installation. Protect metal and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.

3.07 PROTECTION

A. As soon as the tile work in each space has been grouted and cleaned, it shall be covered with either reinforced kraft paper (sisal kraft) or other heavy covering. Floor covering shall be kept and maintained until completion of the Work of all trades or as otherwise directed by the Owner, when it shall be removed without damage to adjoining Work.

END OF SECTION 09300

SECTION 095000 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

A. Section Includes

1. Acoustical ceiling panels
2. Exposed grid suspension system
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
4. Perimeter Trim

B. Related Sections

1. Section 09 20 00 - Gypsum Board

C. Alternates

1. Prior Approval: Unless otherwise provided for in the Contract documents, proposed product substitutions may be submitted no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review of the proposal for acceptability and approved products will be set forth by the Addenda. If included in a Bid are substitute products that have not been approved by Addenda, the specified products shall be provided without additional compensation.

2. Submittals that do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
7. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
9. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material

A. Armstrong Fire Guard Products

10. ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
11. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems
12. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
13. ASTM E 1264 Classification for Acoustical Ceiling Products

B. International Building Code

C. ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality

D. NFPA 70 National Electrical Code

E. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

F. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components

G. International Code Council-Evaluation Services Report - Seismic Engineer Report

1. ESR 1308 - Armstrong Suspension Systems

H. International Association of Plumbing and Mechanical Officials - Seismic Engineer Report

1. 0244 - Armstrong Single Span Suspension System

1.4 SYSTEM DESCRIPTION

Continuous/Wall-to-Wall

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.

B. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.

C. Shop Drawings: Layout and details of acoustical ceilings show locations of items that are to be coordinated with, or supported by the ceilings.

D. Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.

a. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.7 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

1. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.

2. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.

3. Fire Resistance: As follows tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory

B. Acoustical Panels: As with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.

C. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.9 PROJECT CONDITIONS

A. Space Enclosure:

Standard Ceilings: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

HumiGuard Plus Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel, aluminum or stainless steel suspension systems can be installed up to 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling.

HumiGuard Max Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Ceilings with HumiGuard Max performance can be installed in conditions up to 120°F (49°C) and maximum humidity exposure including outdoor applications, and other standing water applications, so long as they are installed with either SS Prelude Plus, AL Prelude Plus, or Prelude Plus Fire Guard XL suspension systems. Products with Humiguard Max performance can be installed in exterior applications, where standing water is present, or where moisture will come in direct contact with the ceiling. Only Ceramaguard with AL Prelude Plus suspension system can be installed over swimming pools.

1.11 WARRANTY

A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:

1. Acoustical Panels: Sagging and warping

2. Grid System: Rusting and manufacturer's defects

B. Warranty Period:

1. Acoustical panels: Ten (10) years from date of substantial completion

2. Suspension: Ten (10) years from date of substantial completion

3. Ceiling System: Thirty (30) years from date of substantial completion

C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.12 MAINTENANCE

A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.

1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.

2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Ceiling Panels/Suspension Systems/Perimeter Systems:

1. Armstrong World Industries, Inc.
2. Approved equal

2.2.1 ACOUSTICAL CEILING UNITS

A. Acoustical Panels Type AP

1. Surface Texture: Smooth
2. Composition: Mineral Fiber
3. Color: White
4. Size: 24 in x 48 in for Kitchen/24" x 24" for upper bathrooms
5. Edge Profile: Square Lay-In 15/16 in for interface with PRELUDE XL 15/16" Exposed Tee grid.
6. Noise Reduction Coefficient (NRC):
7. Ceiling Attenuation Class (CAC) : ASTM C 1414; Classified with UL label on product carton 33
8. Sabin: N/A

9. Articulation Class (AC):

10. Flame Spread: ASTM E 1264; Class A (UL)

11. Light Reflectance (LR) White Panel: ASTM E 1477; 0.89

12. Dimensional Stability: HumiGuard Plus

13. Recycle Content: Post-Consumer - 0% Pre-Consumer - 36%

14. Acceptable Product for kitchen: KITCHEN ZONE, 672 as manufactured by Armstrong World Industries

15. Acceptable Product for Upper Bathrooms: Panels: 24" X 24" X 3/4" thick, angled and beveled tegular edge for lay-in; Fine Fissured ceiling panels by Armstrong.

2.3.1 METAL SUSPENSION SYSTEMS

A. Components:

Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

a. Structural Classification: ASTM C 635 Heavy Duty duty

b. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.

c. Sustainability: Environmental Product Declaration (EPD), Health Product Declaration (HPD)

d. Acceptable Product: PRELUDE XL 15/16" Exposed Tee as manufactured by Armstrong World Industries

B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.

C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least time three design load, but not less than 12 gauge.

D. Edge Moldings and Trim:

1. 7800 - 12' Wall Molding

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.

1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.3 INSTALLATION

A. Follow manufacturer installation instructions.

B. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.

C. Suspend main beam from overhead construction with hanger wires spaced 4-0 on center along the length of the main runner. Install hanger wires plumb and straight.

D. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.

E. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.

F. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 ADJUSTING AND CLEANING

A. Replace damaged and broken panels.

B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove any ceiling products that cannot be successfully cleaned and or repaired. Replace with attic stock or new product to eliminate evidence of damage.

C. Before disposing of ceilings, contact the Armstrong Recycling Center at 877-276-7876, select option #1 then #8 to review with a consultant the condition and location of building where the ceilings will be removed. The consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant with provide assistance to facilitate the recycle of the ceiling.

SECTION 099113 - EXTERIOR 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. Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Wood.
2. Portland cement plaster (stucco).

B. Related Requirements:
1. Section 099123 "Interior Painting" for surface preparation and the application of paint systems on interior substrates.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Indicate VOC content.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Label each coat of each Sample.
3. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Indicate VOC content.

1.4 CLOSEOUT SUBMITTALS

A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used,

product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials[**, from the same product run,**] that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: **1 gal.** of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups 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 each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 10 sq. ft.
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacture's label with the following information:

1. Product name and type (description).
2. Batch date.
3. Color number.
4. VOC content.
5. Environmental handling requirements.
6. Surface preparation requirements.
7. Application instructions.

B. 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 (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

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

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.

D. Hazardous Materials: Hazardous materials including lead paint **are** present in buildings and structures to be painted.

1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified.
2. Perform preparation for painting of substrates known to include lead paint in accordance with EPA Renovation, Repair and Painting Rule and additional requirements of authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company (The); products indicated or comparable product from one of the following:

1. Benjamin Moore

B. Comparable Products: Comparable products of approved manufacturers will be considered in accordance with Section 016000 "Product Requirements," and the following:

1. Products are approved by manufacturer in writing for application specified.
2. Products meet performance and physical characteristics of basis of design product including published ratio of solids by volume, plus or minus two percent.

C. Source Limitations: Obtain paint materials from single source from single listed manufacturer.

1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

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: For field applications, provide paints and coatings that complies with VOC content limits of authorities having jurisdiction.

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 the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.

1. Report, in writing, conditions that may affect application, appearance, or performance of paint.

B. Substrate Conditions:

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

a. Concrete: 12 percent.
b. Fiber-Cement Board: 12 percent.
c. Masonry (Clay and CMU): 12 percent.
d. Wood: 15 percent.
e. Portland Cement Plaster: 12 percent.
f. Gypsum Board: 12 percent.

2. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and 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.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat 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. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
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.

K. Plastic Trim Fabrication 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 and recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

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 Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Equipment, including panelboards
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.

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 EXTERIOR PAINTING SCHEDULE

A. **Portland Cement Plaster (Stucco)** Barrel Vault:

1. Latex System:

a. Prime Coat: Primer sealer, latex.

1) S-W Loxon Concrete & Masonry Primer Sealer, A24W8300, at 8.0 mils (0.203 mm) wet, 3.2 mils (0.081 mm) dry.

b. Prime Coat: Latex, exterior, matching topcoat.
c. Intermediate Coat: Latex, exterior, matching topcoat.
d. Topcoat: Latex, exterior, flat.

1) S-W A-100 Exterior Latex Flat, A6 Series, at 4.0 mils (0.102 mm) wet, 1.2 mils (0.030 mm) dry, per coat.

B. Ferrous Metal, Galvanized-Metal, and Aluminum Substrates:

1. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, water based.

1) S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, 5.0 to 10.0 mils (0.127 to 0.254 mm) wet, 2.0 to 4.0 mils (0.051 to 0.102 mm) dry.

b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.

c. Topcoat: Light industrial coating, exterior, water based, semi-gloss.

1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series, at 2.5 to 4.0 mils (0.064 to 0.102 mm) dry, per coat.

C. Wood Substrates: Including exposed wood items not indicated to receive shop-applied finish.

1. Latex System:

a. Prime Coat: Primer, latex for exterior wood.

1) S-W Exterior Latex Primer, B42, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

b. Intermediate Coat: Latex, exterior, matching topcoat.

c. Topcoat: Latex, exterior, semi-gloss:

1) S-W Solo Acrylic Semi-Gloss, A76 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.END OF SECTION 099113

SECTION 099123 - 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. Section includes surface preparation and the application of paint systems on **the following interior substrates:**
   1. Gypsum board.

B. Related Requirements:

   1. Section 051200 "Structural Steel Framing" for shop priming of metal substrates with primers specified in this section.
   2. Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
   3. Section 099300 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood substrates.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

   1. Indicate VOC content.

B. Sustainable Design Submittals:

   1. Product Data for LEED 2009 Credit EQ 4.2: For paints and coatings, showing printed statement of VOC content.
   2. Laboratory Test Reports: For paints and coatings, indicating compliance with LEED 2009 Credit EQ 4.2 requirements for low-emitting materials.

C. Samples for Initial Selection: For each type of topcoat product.

D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

   1. Submit Samples on rigid backing, 8 inches square.
   2. Label each coat of each Sample.
   3. Label each Sample for location and application area.

E. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Indicate VOC content.

1.4 CLOSEOUT SUBMITTALS

1. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials[**, from the same product run,**] that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: **1 gal.** of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups 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 each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 10 sq. ft.
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer's label with the following information:

1. Product name and type (description).
2. Batch date.
3. Color number.
4. VOC content.
5. Environmental handling requirements.
6. Surface preparation requirements.
7. Application instructions.

B. 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 (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

C. Lead Paint: It is not expected that lead paint will be encountered in the Work.

1. If suspected lead paint is encountered, do not disturb; immediately notify Architect and Owner.

D. Lead Paint: Lead paint **is** present in the existing barn.

1. Do not disturb lead paint or items suspected of containing hazardous materials except under procedures specified.
2. Perform preparation for painting of substrates known to include lead paint in accordance with EPA Renovation, Repair and Painting Rule and additional requirements of authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company (The); products indicated or comparable product from one of the following:

1. Benjamin Moore

B. Comparable Products: Comparable products of approved manufacturers will be considered in accordance with Section 016000 "Product Requirements," and the following:

1. Products are approved by manufacturer in writing for application specified.

2. Products meet performance and physical characteristics of basis of design product including published ratio of solids by volume, plus or minus two percent.

C. Source Limitations: Obtain paint materials from single source from single listed manufacturer.

1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

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: For field applications that are inside the weatherproofing system, paints and coatings shall provide materials that comply with VOC limits of authorities having jurisdiction and for interior paints and coatings applied at Project site, the following VOC limits exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Primers, Sealers, and Undercoaters: 200 g/L.

C. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers."

D. Colors: To be determined.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

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 the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.

1. Report, in writing, conditions that may affect application, appearance, or performance of paint.

B. Substrate Conditions:

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   a. Wood: 15 percent.
   b. Gypsum Board: 12 percent.
   c. Plaster: 12 percent.

2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and 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.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer

E. Retain "Shop-Primed Steel Substrates" Paragraph below if primers are shop applied and are not removed in the field.

F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

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.

H. Aluminum Substrates: Remove loose surface oxidation.

I. 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.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

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. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

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 Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in occupied spaces:

a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 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.

3.6 INTERIOR PAINTING SCHEDULE

A. Metal Substrates (Aluminum, Steel, Galvanized Steel):

1. Latex System:

a. Prime Coat: Primer, rust-inhibitive, water based:

1) S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, at 5.0 to 10 mils (0.127 to 0.254 mm) wet, 2.0 to 4.0 mils (0.051 to 0.102 mm) dry.

b. Intermediate Coat: Water-based acrylic, interior, matching topcoat.
c. Topcoat: Water-based acrylic, semi-gloss:

1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series, at 2.5 to 4.0 mils (0.064 to 0.102 mm) dry, per coat.

d. Topcoat: Water-based acrylic, gloss:

1) S-W Pro Industrial Acrylic Gloss Coating, B66-660 Series, at 2.5 to 4.0 mils (0.064 to 0.102 mm) dry, per coat.

2) S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

B. Wood Substrates called out to be painted:

1. Latex System:

a. Prime Coat: Primer sealer, latex, interior:

1) S-W PrepRite ProBlock Primer Sealer, B51-620 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry.

b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, eggshell:

1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat.

d. Topcoat: Latex, interior, semi-gloss:

1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

e. Topcoat: Latex, interior, gloss:

1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

C. G**ypsum Board** Substrates:

1. Latex System:

a. Prime Coat: Primer, latex, interior:

1) S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils (0.102 mm) wet, 1.0 mils (0.025 mm) dry.

b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, flat:

1) S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

d. Topcoat: Latex, interior, low sheen:

1) S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

e. Topcoat: Latex, interior, eggshell:

1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat.

f. Topcoat: Latex, interior, semi-gloss:

1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

g. Topcoat: Latex, interior, gloss:

1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

END OF SECTION 099123

09 93 13 INTERIOR AND EXTERIOR STAINS & TRANSPARENT FINISHES

Part 1 GENERAL

1.1 SECTION INCLUDES

A Exterior stains, transparent, and semi-transparent finishes

B Interior stains, transparent, and semi-transparent finishes

1.2 RELATED SECTIONS

A Section 03 35 00 - Concrete Finishes

B Section 09 61 19 - Concrete Floor Staining

C Section 09 9113 – Exterior Painting

D Section 09 9123 – Interior Painting

1.3 REFERENCES

A SSPC-SP 1 - Solvent Cleaning

B SSPC-SP 2 - Hand Tool Cleaning

C SSPC-SP 3 - Power Tool Cleaning

D SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete

E ASTM F1869 - Moisture Test by use of Calcium Chloride

F ASTM D4258 - Standard Practice for Cleaning Concrete

G ASTM D4259 - Standard Practice for Abrading Concrete

H ASTM D4260 - Standard Practice for Etching Concrete

I ASTM D4263 - Plastic Sheet Method for Checking Moisture in Concrete

J ICRI #310.2 - Surface Preparation of Concrete

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00, Submittal Procedures.

B. Product Data: Manufacturer's data sheets on each paint and coating product should include:

1 Product characteristics
2 Surface preparation instructions and recommendations
3 Primer requirements and finish specification
4 Storage and handling requirements and recommendations
5 Application methods
6 Cleanup information

C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacture's color samples available.

D. Coating Maintenance Manual: upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Paint Maintenance Manual" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 MOCK-UP

Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of painting on the project.

A. Finish surfaces for verification of products, colors, & sheens
B. Finish area designated by Architect
C. Provide samples that designate prime & finish coats
D. Do not proceed with remaining work until the Architect approves the mock-up samples

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:

1 Product name, and type (description)
2 Application & use instructions
3 Surface preparation
4 VOC content
5 Environmental handling and SDS
6 Batch date
7 Color number

B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

C. Handling: Maintain a clean, dry storage area to prevent contamination or damage to the coatings.

1.7 PROJECT CONDITIONS

Maintain environmental conditions (temperature, humidity, and ventilation) within limits are recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

Part 2 PRODUCTS

2.1 MANUFACTURERS

A Acceptable Manufacturer:
The Sherwin-Williams Company
101 Prospect Avenue NW
Cleveland, OH 44115
Tel: (800) 321-8194
www.sherwin-williams.com

B. Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 Product Requirements.
When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2.2 APPLICATIONS/SCOPE

A Use this article to define the scope of painting if not fully defined in a Finish Schedule or on the drawings. This article must be carefully edited to reflect the surfaces actually found on the project. In some cases, it may be enough to use the first paragraph that says, in effect, "paint everything" along with a list of items not to paint, without exhaustively defining all the different surfaces and items that must be painted.

B If the project involves repainting some but not all existing painted surfaces, be sure to indicate the extent of the repainting.

C The descriptions of each system can also be used to further refine the definition of what is to be painted, stained, or clear finished.

D Surfaces to Be Coated:

Wood Exterior Systems – Opaque
Wood Interior Systems - Transparent

2.3 SCHEDULE INDEX - STAIN & TRANSPARENT FINISHES

A Wood Exterior Systems (vertical) - Opaque

1. Latex Systems

a Solid Color Acrylic Latex

(If severe tannin Bleeding occurs, use Exterior Oil-Based Wood Primer, Y24W8020)

1st Coat: S-W WoodScapes® Solid Color Stain, A15 Series
2nd Coat: S-W WoodScapes® Solid Color Stain, A15 Series
(200-400 sq ft/gal)

Alternate:

(If tannin bleeding occurs, use Exterior Oil-Based Wood Primer, Y24W8020)

1st Coat: S-W ProMar® Solid Color Stain, A16 Series
2nd Coat: S-W ProMar® Solid Color Stain, A16 Series
(200-400 sq ft/gal)

B Wood Interior Systems (vertical) – Clear Finish

1. Water Reducible Polyurethane

a **Clear Finish**

1st Coat: S-W Minwax® Water Based Oil-Modified Polyurethane
2nd Coat: S-W Minwax® Water Based Oil-Modified Polyurethane
(Gloss, Semi-Gloss, Satin)

Alternate:

1st Coat: S-W Minwax® Polycrylic® Protective Finish
2nd Coat: S-W Minwax® Polycrylic® Protective Finish
(Gloss, Semi-Gloss, Satin, Matte, Ultra Flat)

C Wood Interior Floors-Clear Finishes

1. Water Reducible Polyurethane (topcoat, light foot traffic)

a. Clear Finish

1st Coat: S-W Minwax® Waterbased Oil-Modified Polyurethane
2nd Coat: S-W Minwax® Waterbased Oil-Modified Polyurethane
(Gloss, Semi-Gloss, Satin)

Alternate:

1st Coat: S-W Minwax® Ultimate Floor Finish
2nd Coat: S-W Minwax® Ultimate Floor Finish
(Gloss, Semi-Gloss, Satin)

2. Polyurethane (topcoat)

a Clear Finish

1st Coat: S-W Minwax® Super Fast-Drying Polyurethane for Floors
2nd Coat: S-W Minwax® Super Fast-Drying Polyurethane for Floors
(Gloss, Semi-Gloss, Satin)

Alternate:

1st Coat: S-W Minwax® Super Fast-Drying Polyurethane for Floors (350 VOC)
2nd Coat: S-W Minwax® Super Fast-Drying Polyurethane for Floors (350 VOC)
(Gloss, Semi-Gloss, Satin)

2.4 MATERIALS - GENERAL REQUIREMENTS

A Paints and Coatings - General:
1 Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions. VOCs need to be confirmed by using the products EDS sheets.

2 For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.

B Primers:
1 Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

2.5 ACCESSORIES:

A Coating Application Accessories:
1 Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

PART 3 EXECUTION

3.1 EXAMINATION

A Do not begin application of coatings until substrates have been properly examined and prepared. Notify Architect of unsatisfactory conditions before proceeding.

B If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

D Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead based paints, notify Architect immediately if lead based paints are encountered.

3.2 SURFACE PREPARATION

WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority. Removal must be done in accordance with EPA Renovation, Repair and Painting Rule and all related state and local regulations. Care should be taken to follow all state and local regulations which may be more strict than those set under the federal RRP Rule.

A Proper product selection, surface preparation, and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.

B Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination, and the effect on the substrate will also influence the selection of surface preparation methods.

C The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

D Prior to attempting to remove mildew, it is always recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions may be advised. Mildew may be removed before painting by washing with a solution of 1-part liquid household bleach and 3-parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry at least 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

E No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F, unless products are designed specifically for these conditions.

F Methods:

1 Wood—Exterior
Must be clean and dry. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth. Patching compounds will generally be visible through clear coatings.

2 Wood—Interior
All finishing lumber and flooring must be stored in dry, warm rooms to prevent absorption of moisture, shrinkage, and roughening of the wood. All surfaces must be sanded smooth, with the grain, never across it. Surface blemishes must be corrected and the area cleaned of dust before coating. Patching compounds will generally be visible through clear coatings.

3.3 INSTALLATION

A Testing: Due to the wide variety of substrates, preparation methods, application methods and environments, one should test the product in an inconspicuous spot for adhesion and compatibility prior to full-scale application.

B Apply all coatings and materials with manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendation.

C Do not apply to wet or damp surfaces.

1.Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days.
2.Test new concrete for moisture content.
3.Wait until wood is fully dry

D Apply coatings using methods recommended by manufacturer.

E Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

F Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.

G Regardless of number of coats specified, apply as many coats as necessary for complete hide and uniform appearance.

H Exterior Woodwork: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 2 weeks.

I Inspection: The coated surface must be inspected and approved by the Architect or Engineer just prior to the application of each coat.

3.4 PROTECTION

A Protect finished coatings from damage until completion of project.

B Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION 099313

SECTION 10400 - ADA Signage

Part 1 - General

1.01 Description

A. Work of this Section shall be governed by the Contract Documents. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. ADA compliant signage.

B. Related Work Specified Elsewhere
1. Rough Carpentry: Section 06100
2. Painting: Section 09900

1.02 References

A. American with Disabilities Act

B. National Association of Architectural Metal Manufacturers (NAAMM) .

C. American National Standards Institute (ANSI)

1.03 SUBMITTALS

A. Schedule of signs and drawings indicating sign type, material , location, text, text letter style, color, and other pertinent information.

B. Sign color samples.

1.04 QUALITY ASSURANCE

A. Work of this Section shall be performed by firms experienced in ADA compliant signage manufacture and the installation of these items.

Part 2 - PRODUCTS

2.01 ROOM NAME PLATES AND NUMBER PLAQUES

A. Provide 21 ADA signs (15 Room signs, 3 elevator and 3 stair indicators)

B. Signs shall have the following characteristics:
1. Tactile characters/symbols shall be raised the required 1/32 inches from sign plate face. Signs shall be of one-piece construction; added;on and/or engraved characters are unacceptable.

2. Text shall be accompanied by Grade 2 braille.

3. All letters, numbers and/or symbols shall contrast with their background - either light characters on a dark background or dark characters on a light background. Characters and background shall have matte finish.

D. Braille-TacTM one-piece construction sign system utilizing chemical etch process to produce raised numbers and letters with corresponding Grade II Braille (complying with Specification #800), and pictograms on zinc sign, all complying with ADA and CABO/ANSI A117.1 requirements.

1. Sanded face Silvertone (natural Zinc) finish.
2. Dark Green background color.

E. Lettering style shall be helvetica medium, initial caps or other sans serif or simple serif typeface.

F. Sizes of letters and numbers shall be as indicated on the drawings.

G. Manufacturer
1. Advance Corporation, Braille-TacTM Division, 8200 - 97th Street South, Cottage Grove, Minnesota 55016 800-328-9451.

H. Mounting hardware shall be manufacturer's standard tamperproof fasteners.

PART 3 - EXECUTION

3.01 INSPECTION & PREPARATION

A. Install no Work until surfaces on which signage, seals, tablets, and other Work of this Section are to be placed and attached are free of defects and are in a completed condition.

3.02 INSTALLATION

A. Install all signage and other Work of this Section level and plumb; secure to substrate in manner as detailed on the Drawings and as recommended by the Manufacturer.

3.03 CLEAN-UP AND PROTECTION

A. Clean all surfaces of Work of this Section. Remove all debris resulting from the Work of this Section from Work area. Remove protection covers; protect Work until Project Completion.

END OF SECTION 10400

SECTION 10 44 13
FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 DESCRIPTION

This section covers recessed fire extinguisher cabinets. Contractor to supply and install units where shown on the plans.

1.2 RELATED WORK

A. Field Painting: Section 09 91 00, PAINTING.

1.3 SUBMITTALS

A. None required as unit will be provided by the Owner.

1.4 APPLICATION PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society of Testing and Materials (ASTM):
D4802-02 ..... Poly (Methyl Methacrylate) Acrylic Plastic Sheet

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHER CABINET

Recessed type with flat trim of size and design shown.

2.2 FABRICATION

A. Form body of cabinet from 0.9 mm (0.0359 inch) thick sheet steel.

B. Fabricate door and trim from 1.2 mm (0.0478 inch) thick sheet steel with all face joints fully welded and ground smooth.

1. Glaze doors with 6 mm (1/4 inch) thick ASTM D4802, clear acrylic sheet, Category B-1, Finish 1.
2. Design doors to open 180 degrees.
3. Provide continuous hinge, pull handle, and adjustable roller catch.

2.3 FINISH

A. Finish interior of cabinet body with baked-on semigloss white enamel.

B. Finish door, frame with manufacturer's standard baked-on prime coat suitable for field painting.

PART 3 - EXECUTION

A. Install fire extinguisher cabinets in prepared openings and secure in accordance with manufacturer's instructions.

B. Install cabinet so that bottom of cabinet is 975 mm (39 inches) above finished floor.

- - - E N D - - -

SECTION 108000 - Bath Accessories

Part 1 - General

1.01 Description

A. Provide materials, labor, equipment and services necessary to furnish, deliver and install all work of this Section and as shown on the drawings, as specified herein and as required by job conditions.

Work of this Section shall include but not be limited to the following:

1. Mirrors.
2. Grab Bars
3. Toilet seats.
4. Soap dispensers.
5. Hand Dryer
6. Toilet paper dispensers.

B. Related Work Specified Elsewhere

1. Rough Carpentry: Section 06100

1.02 SUBMITTALS

A. Submit two (2) each of the following to Architect for review prior to delivery and installation.

B. Product Literature

1. Submit manufacturers technical data and installation instructions for review in accordance with the requirements of the Contract Documents.

2. Submit printed manufacturer's literature, data sheets and/or catalog cuts for all items which are pre-manufactured and will be provided as part of the work of this Section.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job ready for use, and fabricated in as large sections and/or assemblies as practical and shall be identical to approved shop drawings and samples.

B. Store materials under cover in dry and clean locations off the ground. Take every precaution not to damage or mar finish.

C. Remove materials which are damaged or otherwise not suitable for installation from the job site, and replace with acceptable materials at the Contractor's expense.

Part 2 - PRODUCTS

2.01 MIRRORS

A. Mirror frame fabricated of #20 gauge stainless steel, one piece formed 1/2" x 1/2" x 1/2" channel frame, with corners precision mitered and reinforced to a hairline joint. Entire frame to be brush satin finish. #1 quality, 1/4" polished plate glass mirror, silver coated and sealed with electrolytic copper plating. Back plate #20 gauge pre-coated steel which secures padding and fillers behind mirror. Hanging device is formed to back plate for easy mounting. When mirror is installed, locking device automatically sets for theft-resistant mounting.

2.02 TOILET SEAT

A. Extra heavy duty, solid plastic, open front, without a cover, molded in one piece with no joints, seams or crevices.

B. The manufacturer's name shall be molded into the seat.

C. Metal check hinges shall be integrally molded into the seat. Hinges, inserts, bearings and posts shall be of brass or stainless steel;the upper post and metal exposed above the fixture rim shall be covered with plastic to match the seat.

D. Surface shall be hard, polished, impervious to moisture, and not affected by the action of uric acid.

E. Color: White.

2.03 COAT HOOKS/DOOR STOPS

Install one small Rejuvenation Item #C0986 classic iron coat hook per stall door.

2.04 TOILET PAPER & PAPER TOWEL DISPENSER

A. Provide one Bobrick B-2888 Surface Mounted Multi-roll Toilet Tissue Dispenser at each toilet.

2.05 SOAP DISPENSER (NIC)

A. Provided by Owner and installed by the Contractor.

2.06 AUTOMATIC HAND DRYER

A. Install Xcerator surface mounted automatic hand dryer at each location shown.

2.07 SEAT COVER DISPENSER

A. At each toilet location provide Bobrick B-221 Stainless Steel Surface Mounted Seat Cover Dispenser..

2.08 BABY CHANGING STATIONS

A. Install one Koala Kare KB310-SSWM Horizontal Stainless Steel Surface Mount at each location shown (one per bathroom).

2.09 GRAB BARS

A. Grab bar assemblies consisting of stainless steel tubing with integrally welded mounting flanges secured to concealed tenon plates with theft-resistant fasteners, and complying with the following requirements:

1. Provide one 36" and one 42" grab bar per ADA toilet compartment mounted in compliance with ADA requirements. Provide adequate blocking in wall to support grab bars.

2. Tubing: Stainless steel, 1 - 1/2" od x 18 gauge wall thickness. Bend tubing at each end and join to flanges by concealed welding. Total projection from wall line (including bar diameter): 3 inches.

3. Flanges: Stainless steel, 3 inch diameter, 11 gauge wall thickness not less that 1/2 inch deep.

4. Finish: Striated non-slip polished finish in a continuous cross-hatched (diamond) pattern or shot peened non-slip finish, on entire bar surface exclusive of returns (ends).

5. Tenon Plates: Stainless steel, 13 gauge disc. Tenon plates shall be designed to allow plate location adjustment.

6. Fasten grab bar flanges to tenon plates with not less than 3 concealed fasteners equally spaced around flange.

PART 3 EXECUTION

3.01 INSTALLATION

A. General

Unless otherwise indicated, install work of this Section in strict accordance with the manufacturer's printed instructions.

1. Install all attachments, anchorage devices and fasteners as required to securely mount accessory units to types of wall or partition construction indicated. The use of fasteners with plastic wall plugs is prohibited. Where solid substrates for fastening are not available, provide toggle bolts.

2. Provide blocking in walls for support of grab bars, shower seats and curtain rods.

B. Coordination with Drawings & Other Trades

1. Unless otherwise indicated, install work of this Section as indicated on the Interior Elevations and Floor Plans. Coordinate with plumbing and electrical work.

2. Install accessories in accordance with the Americans with Disabilities Act.

3.02 CLEANING

A. Adjust accessories for proper installation.

B. Remove protective wrapping from installed accessories after completion of other work liable to damage accessory finish. Clean and polish exposed surfaces prior to final inspection.

END OF SECTION 108000

SECTION 14240 – LU/LA ELEVATORS

PART 1 GENERAL

PART 1 — GENERAL

1.01 Section Includes: Limited Use/Limited Application (LU/LA) commercial elevator with 1:2 roped hydraulic lift system.

1.02 Work Included: Furnish all labor and materials, equipment and incidentals necessary to assemble and erect the commercial elevator.

1.03 Work by Others:
- A. Construct a hoistway of the size required by the manufacturer.
- B. Construct a machine room.
- C. Provide system to maintain hoistway and machine room temperature between 50-90 degrees Fahrenheit.
- D. Provide electrical power per the manufacturer and the approved drawings.

1.04 References:
- A. ASME/ANSI A17.1 "Safety Codes for Elevators and Escalators," Section 5.2
- B. ICC/ANSI A117.1
- C. NFPA 70 National Electrical Code
- D. NFPA 101 Life Safety Code

1.05 System Description:
- A. Travel: Approximately 10'6"
- B. Stops: Two
- C. Load Capacity: 1400 lb.
- D. Speed: 30 fpm

1.06 Submittals: Submit product data, including manufacturer's specifications and submittal drawings.

1.07 Quality Assurance:
- A. Installer Qualifications: A company experienced in the assembly and erection of elevators of the type specified; trained and certified by the manufacturer.
- B. Manufacturer Qualifications: A company specializing in the manufacture of lifts for the disabled and LU/LA elevators.

1.08 Warranty: Unit shall have a two (2) year limited parts warranty.

1.09 Maintenance:

A. Maintenance of the LU/LA elevator shall consist of regular cleaning and inspection at intervals not longer than every 6 months.

B. Inspection: ASME A17.1 requires all LU/LA elevators to be inspected every 6 months.

PART 2 — PRODUCTS

2.01 Manufacturer: National Wheel-O-Vator, A Division of ThyssenKrupp Access

2.02 Components:

A. Car:

1. Size 42"W x 54" D clear).
2. Enclosure: Securely fastened to the car frame and platform. Shall be constructed of formed sheet steel panels with powder coated finish. Floorboard shall be constructed of 1 1/2" AC plywood with fire retardant coating.
3. Car Entrances: Automatically operated, horizontally sliding steel doors with a full height safety screen.
4. Car Doors: Shall be 3'0" x 6'8" with powder coated finish.
5. Handrail: Stainless steel handrail.
6. Telephone: Recessed phone box.
7. Control Panel: Provide one momentary pressure illuminated button for each landing, keyed in car stop switch and alarm button.
8. Visual feedback indicating call for car and car's next travel direction.
9. Standard Color: Autumn White (optional colors available).
10. Audible Feedback: Provide audible signal indicating car arrival and direction of travel.
11. Tactile Feedback: Provide tactile/Braille characters on car, hall call push buttons and hoistway door jambs.
12. Interior Lighting: Provide with automatic operation.

B. Hoistway Entrances:

1. Provide each entrance with an automatically operating, horizontal sliding door in frame with primed finish.
2. Fire Rating: Hoistway doors and frame shall be UL certified for 1 1/2 hour fire rating.
3. Doors shall be provided with an interlock.

C. Drive System: Roped hydraulic (1:2) with a two speed valve and a submerged motor.

D. Cable System: 1:2 system using (2) 3/8" - 7x19 aircraft cable.

E. Guide Rail: Shall consist of two 8 lb tee rails.

F. Car Frame: Shall be equipped with nonmetallic faced roller guide wheels.

G. Leveling device: Provide hall effect switch system to maintain car within 1/4" of the landing.

H. Control Systems: Selective collective microprocessor, UL listed.

I. Motor (submerged): 5.0 HP, 1750-RPM 208/230 VAC, single phase, (three phase available).

J. Wiring:

1. Provide flexible traveling cable for electrical lights and controls in car.
2. All other electrical wiring shall be insulated, flame retardant, moisture proof and installed in conduit.

K. Safety Devices:

1. Slack cable protection with stainless steel linkage.
2. Terminal stopping device.
3. Over speed protection.
4. Platform toe guard at the car entrance.

L. Two battery emergency operation system, which powers a car light, emergency alarm system and allows car to descend to bottom terminal floor.

PART 3 — EXECUTION

3.01 Installation:

A. All components shall be assembled an erected in strict compliance with manufacturer's printed instructions.
B. All wiring shall be in accordance with the wiring diagram furnished by the manufacturer.

3.02 Field Quality Control:

A. Static/Running Load Test: Load rating and safety factors shall meet or exceed those specified in ASME A17.1.

END OF SPECIFICATION Section 142400