



## FOUNDATION OFFICES RENOVATION

715 E. Front St.  
Traverse City, MI 49686  
PROJECT NO. 24.513

SPECIFICATIONS

**Bid/Permit Set**

July 17, 2026

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### Architecture

**Cornerstone Architects**

122 S. Union Street, Suite 200  
Traverse City, MI 49684  
phone: 231.947.2177  
contact: John Dancer, AIA

### Owner

**Northwestern Michigan College**

1701 E. Front St.  
Traverse City, MI 49686  
phone: 231.995.1114  
contact: Patrick Quinlan

### Mechanical / Electrical / Plumbing

**Nealis Engineering**

1419 Industry Dr.  
Traverse City, MI 49686  
phone: 231.933.0510  
contact: Jason VanBrocklin, PE

**SECTION 00 01 10**  
**TABLE OF CONTENTS**

**DOCUMENTS -- INTRODUCTORY INFORMATION, BIDDING AND CONTRACT REQUIREMENTS**

|               |                                           |
|---------------|-------------------------------------------|
| 00 01 01..... | Project Title Page                        |
| 00 01 10..... | Table of Contents                         |
| 00 01 15..... | List of Drawings                          |
| 00 11 13..... | Advertisement for Bid                     |
| 00 11 16..... | Invitation to Bid                         |
| 00 21 13..... | Instructions to Bidders                   |
| 00 41 00..... | Bid Form                                  |
| 00 43 00..... | Supplements to Bid Form                   |
| 00 43 30..... | Supplement B - List of Subcontractors     |
| 00 45 50..... | Statement Regarding Familial Relationship |
| 00 45 51..... | Iran Economic Sanctions Act Certification |
| 00 52 13..... | Agreement                                 |
| 00 72 00..... | General Conditions                        |
| 00 73 00..... | Supplementary Conditions                  |

**DIVISION 1 -- GENERAL REQUIREMENTS**

|               |                                            |
|---------------|--------------------------------------------|
| 01 11 00..... | Summary                                    |
| 01 20 00..... | Price and Payment Procedures               |
| 01 30 00..... | Administrative Requirements                |
| 01 40 00..... | Quality Requirements                       |
| 01 42 19..... | Reference Standards                        |
| 01 60 00..... | Product Requirements                       |
| 01 70 00..... | Execution Requirements                     |
| 01 74 19..... | Construction Waste Management and Disposal |
| 01 78 00..... | Closeout Submittals                        |

**DIVISION 03 – CONCRETE**

|               |                               |
|---------------|-------------------------------|
| 03 54 16..... | Hydraulic Cement Underlayment |
|---------------|-------------------------------|

**DIVISION 04 – MASONRY**

|               |                          |
|---------------|--------------------------|
| 04 06 50..... | Mortar and Masonry Grout |
| 04 22 00..... | Concrete Unit Masonry    |

**DIVISION 05 – STEEL**

05 50 00 .....Metal Fabrications

**DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES**

06 10 00 .....Rough Carpentry

06 41 19 .....Countertops

**DIVISION 7 -- THERMAL AND MOISTURE PROTECTION**

07 21 00 .....Insulation

07 84 00 .....Fire-stopping

07 90 00 .....Joint Sealers

**DIVISION 08 – OPENINGS**

08 40 00 .....Entrances and Storefronts

08 71 10 .....Door Hardware

08 80 00 .....Glazing

**DIVISION 09 – FINISHES**

09 21 16 .....Gypsum Board Assemblies

09 51 00 .....Suspended Acoustical Ceilings

09 65 00 .....Resilient Flooring

09 68 00 .....Carpeting

09 90 00 .....Painting and Coating

**DIVISION 12 – FURNISHINGS**

12 24 13 .....Manually Operated Window Shades

12 32 16 .....Plastic-Laminate-Clad Casework

***See MEP Related Specifications on Drawings Sheets*****END OF SECTION 00 01 10**

**SECTION 00 01 15****LIST OF DRAWINGS****1.01 REFERENCE**

ATS-1                      TITLE SHEET

**1.02 CODE**

ADA                      ADA BARRIER FREE CLEARANCES  
CODE-1                CODE PLAN

**1.03 ARCHITECTURAL**

A101                    DEMO PLAN, FLOOR PLAN  
A102                    REFLECTED CEILING PLAN

**1.04 PLUMBING**

PD101                PLUMBING ENLARGED DEMOLITION PLAN  
P101                   PLUMBING ENLARGED FLOOR PLAN  
P200                   PLUMBING SCHEDULES & DETAILS

**1.05 MECHANICAL**

MD101                MECHANICAL ENLARGED DEMOLITION PLAN  
M101                   MECHANICAL ENLARGED FLOOR PLAN  
M200                   MECHANICAL SCHEDULES & DETAILS

**1.05 ELECTRICAL**

E000                   ELECTRICAL SCHEDULES & DETAILS  
ED101                ELECTRICAL ENLARGED DEMOLITION PLAN  
E101                   ELECTRICAL ENLARGED FLOOR PLAN  
E200                   ELECTRICAL SCHEDULES  
E900                   ELECTRICAL SPECIFICATIONS  
E901                   ELECTRICAL SPECIFICATIONS  
E902                   ELECTRICAL SPECIFICATIONS  
ELC                    EMERGENCY LIGHTING CALCULATIONS

**END OF SECTION****00 01 15**

**SECTION 00 11 13****ADVERTISEMENT FOR BID****FROM:****The Owner** (hereinafter referred to as Owner):

Northwestern Michigan College (NMC)  
1701 E. Front St.  
Traverse City, MI 49686  
Phone: 231.995.1147  
Contact Person: Troy Kierczynski

**And the Architect:**

Cornerstone Architects, Inc.  
122 S. Union Street, Suite 200  
Traverse City, MI 49684  
Phone: 231.947.2177  
Contact Person: John E. Dancer, AIA Principal

**DATE: July 20<sup>th</sup>, 2026****TO: POTENTIAL BIDDERS**

The Owner will receive sealed bids for a Single Prime, Stipulated Sum Contract for the **NMC Foundation Offices Renovation** located at **715 E. Front Street, Traverse City, MI 49686**

Bids for a Stipulated Sum contract shall be received by Wednesday, **August 5<sup>th</sup>, 2026 at 2:00 pm.** Bid proposals must be attached as a PDF in an email to Don Loeffler ([dloeffler@nmc.edu](mailto:dloeffler@nmc.edu)). The email subject line shall be indicated for – **“NMC Foundation Offices Bid”**. Any bids received after the specified date and time will not be considered.

**Project Description:**

Interior renovation of existing classroom space for new offices for the NMC Foundation which includes an open office area, individual office, kitchenette, and conference room.

**The Project Scope include but is not limited to:**

- Interior renovation in existing space including selective demolition of existing, modification to existing, and new construction work.
- Fire Alarm & Fire Suppression modification: design and installation.
- Electrical work: Demolition of existing lighting/power, new lighting/power, new emergency lighting
- Mechanical work: Demolition/modification of existing mechanical system/components and installation of new mechanical components
- Plumbing work: Demolition/modification of existing plumbing components, installation of new plumbing components

**Schedule:**

- A. It is the intent of the Owner to award a contract within thirty (30) days after opening bids.
- B. A complete list of all subcontractors, material and equipment suppliers shall be furnished to the Owner's PM by the apparent low bidder within 24 hours after bid opening.
- C. The successful bidder is to prepare a Preliminary Construction Schedule for review with the Owner within three (3) calendar days of the bid opening.
- D. Construction period to begin upon Board Approval on **August 17<sup>th</sup>** with Substantial Completion in Fall 2026.

- E. Contractor to coordinate schedule of work with Owner's PM. Contractor shall not begin work prior to receiving proper authorization from Owner's PM.

**Bidding Documents:**

Requirements, drawings and specifications for submissions are available on/at or through:

- Builder's Exchange Northwest Michigan
- Traverse Reproduction / 1373 Barlow Rd / Traverse City, MI 49686 at the bidders' expense.

**Pre-Bid Meeting:**

A Pre-Bid Conference, mandatory for General Contractors and sub-contractors, will be held on Wednesday, **July 29<sup>th</sup>**, 2026 at the project site beginning at 11:00 AM. Supplemental conferences will **not** be held.

It is expected all bidders will be familiar with the site, project and existing conditions at the time their bid is submitted.

**Bidding:**

Refer to other bidding requirements described in **Document 00 21 13 - Instructions to Bidders**; and Document 00 30 00 - Information Available to Bidders.

Submit your offer on the Bid Form provided – **Document 00 41 00 – Bid Form**. Bidders may supplement this form as appropriate.

Bids shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the Owner or any employee of the bidder.

Use the Form provided as **Section 00 45 50 – Statement Regarding Familial Relationship**.

Bids shall be accompanied by a sworn and notarized statement certifying bidder and subcontractors to this bidder are not Iran-linked business.

Use the Form provided as **Section 00 45 51 – Iran Economic Sanctions Act Certification**.

Your offer will be required to be submitted under a condition of irrevocability for a period of 60 days after submission.

The Owner reserves the right to accept or reject any or all offers, waive irregularities, and to accept the bid that in their opinion is in the best interest of the Owner.

**END OF SECTION 00 11 16**

**SECTION 00 21 13****INSTRUCTIONS TO BIDDERS****PART 1 - GENERAL****1.1 PROJECT IDENTIFICATION**

- A. Project: **NMC Foundation Offices Renovation**  
715 E. Front St, Traverse City, MI 49686
- B. Owner: Northwestern Michigan College
- C. Owner Contact(s)  
Patrick Quinlan  
[pquinlan@nmc.edu](mailto:pquinlan@nmc.edu)  
231.995.1114
- D. Architect:  
Representative: John Dancer  
Cornerstone Architects  
122 S. Union, Suite. 200  
Traverse City, MI 49684  
[jdancer@cornerstone-arch.com](mailto:jdancer@cornerstone-arch.com)  
231.947.2177

**1.2 SUMMARY OF WORK**

- A. The Work of the Project is defined by the Contract Documents and includes but is not limited to the following:
1. Provide all work, permits and coordinate inspections, testing and start-up necessary for a complete and operational facility. Work of this proposed Contract comprises renovation and demolition, including general construction, mechanical, and electrical work.
- B. Type of Contract
1. Project will be constructed under a single prime contract.
  2. The Contract form of agreement between the Owner and Contractor shall be: according to **AIA document A104-2017**. (*Standard Abbreviated Form of Agreement Between the Owner and Contractor*)

**1.3 QUALITY CONTROL**

- A. The Contractor shall maintain continuously, a competent superintendent, satisfactory to the Owner, with authority to act for him in all matters pertaining to the work.

#### 1.4 PROCUREMENT OF DOCUMENTS

- A. Bid documents are available in PDF format at:
- Northwestern Michigan College RFPs: <https://www.nmc.edu/departments/finance-administration/requests-for-proposals/index.html>
  - Builders Exchange of Northwest Michigan / 1373 Barlow Street / Traverse City / MI.
  - Bid sets may be printed & purchased from Traverse Reproduction / 1373 Barlow Rd / Traverse City, MI 49686 at the bidders' expense.
- B. Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not grant a license for other purposes. Only full sets of Bid Documents will be provided. Partial distribution of the Bid Documents to bidding parties is not permitted.
- C. Upon receipt of Bid Documents verify that documents are complete. Notify Architect should the documents be incomplete.
- D. Immediately notify Architect upon finding discrepancies or omissions in the Bid Documents.

#### 1.5 INQUIRIES/ADDENDA

- A. Email questions to Cornerstone Architects:  
( Andy Lin, [alin@cornerstone-arch.com](mailto:alin@cornerstone-arch.com) )
- B. Addenda will only be issued to General Contractors who are plan holders.
- C. Addenda may be issued via email during the bidding period.  
1. Provide your email contact information to Architect's office upon receiving Bid Documents.
- D. All Addenda become part of the Contract Documents. Include resultant costs in the Bid Amount.
- E. Verbal answers are not binding on any party.
- F. Clarifications requested by bidders must be in writing not less than 4 days before date set for receipt of bids. The reply will be in the form of an Addendum, a copy will be forwarded to known recipients via email.

#### 1.6 PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS

- A. Where the Bid Documents stipulates a particular product, substitutions will be considered up to 4 days before receipt of bids.
- B. When a request to substitute a product is made, Architect may approve the substitution and will issue an Addendum to known bidders.
- C. The submission shall provide sufficient information to determine acceptability of such products.
- D. Provide complete information on required revisions to other work to accommodate each proposed substitution.
- E. Provide products as specified unless substitutions are submitted in this manner and accepted.
- F. See Section 01 60 00 - Product Requirements for additional requirements.

## **SITE ASSESSMENT**

### **1.7 SITE EXAMINATION**

- A. It shall be understood that each Bidder has been given the opportunity to visit the site (by appointment only) and knows the conditions under which the work will be done. Lack of such knowledge will not constitute a basis for any claims whatsoever for extra compensation or extension of time.

### **1.8 PRE-BID MEETING**

- A. A Pre-Bid Conference, mandatory for General Contractors and Sub-Contractors, will be held on Wednesday, July 29th, 2026 at the project site beginning at 11:00 AM. Supplemental conferences will not be held.
- B. Individuals present and listed on sign-in sheet for the conference will be included on the distribution list for future issued addenda or clarifications.
- C. Representatives of Architect will be in attendance.
- D. Information relevant to the Bid Documents will be recorded in an Addendum, issued to Bid Document recipients.

### **1.9 SCHEDULE**

- A. It is the intent of the Owner to award a contract within thirty (30) days after opening bids.
- B. A complete list of all subcontractors, material and equipment suppliers shall be furnished to the Owner's PM by the apparent low bidder within 24 hours after bid opening.
- C. The successful bidder is to prepare a Preliminary Construction Schedule for review with the Owner within three (3) calendar days of the bid opening.
- D. Construction period to begin upon Board Approval on **August 17<sup>th</sup>** with Substantial Completion in **Fall 2026**.
- E. Contractor to coordinate schedule of work with Owner's PM. Contractor shall not begin work prior to receiving proper authorization from Owner's PM.

### **1.10 BID RECEIPT**

- A. Bids for a Stipulated Sum contract shall be received by Wednesday, **August 5<sup>th</sup>, 2026 at 2:00 pm**. Bid proposals must be attached as a PDF in an email to Don Loeffler ([dloeffler@nmc.edu](mailto:dloeffler@nmc.edu)). The email subject line shall be indicated for – **"NMC Foundation Offices Bid"**. Any bids received after the specified date and time will not be considered.
- B. Bids will be privately opened. The Owner complies with all federal and state laws and regulations including the requirement not to contact with sanctioned individuals or companies

**1.11 WORK RESTRICTIONS**

- A. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
- B. Parking: Contractor vehicles must be parked in legal parking areas or will be subject to towing, unless specific consent has been given by the Owner for purposes of loading or unloading tools, equipment, materials, etc. Parking of vehicles on sidewalks, landscape or other areas is prohibited.
- C. Trash disposal: Contractor is responsible for the removal of all trash, debris, excess material, etc. The use of the Owner's dumpsters is not permitted.
  - 1. Failure to abide by this may render Contractor subject to back charges.
- D. Use of the Owner's owned equipment, lifts, ladders, tools, custodial equipment or supplies, etc is specifically prohibited. Contractor shall supply all necessary tools, equipment and materials necessary to complete the work.

**1.12 ACCESS TO SITE**

- A. Use of Site: Limit use of Project site to areas within the Contract limits. Do not disturb portions of site beyond areas in which the Work is indicated. Contractor to protect all adjacent building materials, surfaces, Owner's furnishings, etc and is responsible for any repair/restoration/replacement required as a result of any damage caused by the contractor's operations. Worker access will be badged through employee entrance.
- B. Area of Work: Contractor must keep the area of work reasonably presentable and clean throughout the duration of the work.
- C. Security: Contractor is responsible for barricades, signage, etc necessary to secure the area of work during construction.
- D. Driveways, Walkways, Entrances, Doors: Keep all means of access and egress serving premises clear and available to Owner, Owner's staff, students, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Do not restrict, close or obstruct access to premises unless given specific written permission from the Owner's PM.
- E. Deliveries: Schedule deliveries to minimize use of driveways and entrances by construction operations and to minimize space and time requirements for storage of materials and equipment on-site. Materials delivers to come through door west of Employee entrance. Route will be walked during Pre-bid meeting.
- F. Storage: Staging of contractor equipment, materials, tools or other project related items in data closets, janitorial closets, penthouses, tunnels or areas other than those specifically directed by the Owner is prohibited. Contractor shall safeguard their materials, tools, equipment. The Owner is not responsible for vandalism and/or theft of same.

**1.13 COORDINATION WITH OCCUPANTS**

- A. Owner Occupancy: Owner will occupy the premises during entire construction period, including potentially the areas under construction.

- B. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations.
- C. Provide not less than 72 hours notice to Owner's Representative of activities that will affect Owner's operations or building occupants, including but not limited to utility interruptions, odor, noise, vibration.

#### **1.14 PROJECT CLOSEOUT**

- A. Cleaning: Contractor is responsible for final cleaning of work area. No dust, debris, trash, excess materials etc. may be left behind.
  - 1. Failure to properly clean work area may result in the contractor being back charged for the use of the Owner's custodial staff.
- B. As-built Record Drawing(s): Provide Owner with record documents of installation including but not limited to:
  - 1. Detailed layout drawings of system showing piping and device locations.
  - 2. Wiring and control diagrams.
  - 3. Other requirements as noted in other specification sections.
- C. Warranties: Provide one (1) year warranty on all materials and labor. Provide additional warranty information for all products, systems, materials, equipment, etc
- D. Operation & Maintenance Data: Refer to system specification section(s).
- E. Certified Payroll: Submit with each invoice for the work.
- F. Final payment will not be made until all closeout documents have been received, punch list items are complete and the work area is clean and the Owner's PM has approved the work.

### **PART 2 – MATERIALS**

#### **2.1 OWNERSHIP OF DOCUMENTS**

- A. Drawings and specifications purchased by Bidders for bidding remain property of the Bidders and shall not be sent to the Owner or Architect for a refund of the "Cost to Purchase."

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION OF DOCUMENTS AND SITE**

- A. It is the Bidder's responsibility to study the drawings and specifications, visit the construction site and examine existing conditions to correlate site observations with requirements of the Contract Documents.
- B. All bidders must give prior notification to Owner's PM and schedule a time to examine the site after the pre-bid meeting.
- C. No "EXTRA" payment or allowance will be made to cover obvious discrepancies or changes required due to existing site conditions not visually determined and addressed in writing to the Owner before bid opening, or by reason of any error or oversight on the Contractor's part.

- D. Drawings shall not be scaled by Bidders for the purpose of bidding. Information required for bidding shall be obtained by using the indicated dimensions of each plan, elevation, section or detail. All discrepancies noted by the Bidders shall be immediately brought to the Owner's attention.

### **3.2 INTERPRETATIONS AND CORRECTIONS OF DOCUMENTS**

- A. Written requests must be submitted to the Owner's PM a minimum of four (4) days before receipt of bids for clarification or interpretation of errors, inconsistencies or ambiguities found in contract documents.
- B. An addendum will be issued to Bidders to clarify the subject or request a minimum of two (2) days before receipt of bids; the addendum will become part of the Contract Documents.
- C. Only interpretations, corrections or changes made by addendum will be binding.

### **3.3 SUBSTITUTIONS**

- A. To obtain approval to use unspecified products, Bidders shall submit a written request to the Architect a minimum four (4) days before receipt of bids. Requests received after this time will not be considered.
- B. Submit, with the request, all-necessary samples and substantiating data to prove equal quality and performance to the product originally specified.
- C. If proposed product is accepted, an addendum will be issued to Bidders a minimum two (2) days before receipt of bids and will become part of the Contract Documents.
- D. Only substitutions accepted by addendum are binding.
- E. No substitutions will be allowed after receipt of bids.

### **3.4 CODES, ORDINANCES AND REGULATIONS**

- A. Furnish and install all labor and material according to latest codes, ordinances and regulations for all governing bodies having project jurisdiction.
- B. The quality of labor and material shall be as required by drawings and specifications except when exceeded by local codes, ordinances, or regulations.
- C. Contracts for work under this bid will require the Contractor and subcontractors to maintain policies of employment and to pay wage rates as described in the General Conditions and/or this Section.

### **3.5 BASIS OF BID**

- A. SECTION 1.2 SUMMARY OF WORK describes the basis of bids.
- B. A Stipulated Sum bid is to be provided.
- C. The Bidder shall include all unit cost items and allowances included in the Proposal Form. Bids, which are incomplete, conditional, obscure or which contain additions not asked for will be subject to rejection.

### 3.6 PREPARATION AND SUBMITTAL OF BID

- A. Bids are due no later than the time, date and location noted in **Section 1.10 A. BID RECEIPT**.
- B. The Bidder shall fill in all blanks by typing or lettering in ink. Sums are to be given both numerically and written, with the amount written in words to govern in case of discrepancy. Bid shall give legal name of Bidder and shall be signed by a person legally authorized to bind the Bidder to a contract.
- C. All addenda received by the Bidder shall be acknowledged by placing all identifying addendum numbers and dates on bid proposal form.
- D. Required documentation to be submitted with the bid:
  - 1. Signed Bid Form
  - 2. Signed Iran Economic Sanctions Act Certification
  - 3. Signed Statement Regarding Familial Relationship
- E. Bids to be submitted via email.
- F. Failure to submit the minimum requirements may render the bid unresponsive and may eliminate the bid from consideration for award.
- G. The bidding contractor is solely responsible for the timely delivery of the proposal. Submissions received after the posted due date and time will be returned unopened. No employee of the Owner will be held responsible for prematurely opening an incorrectly addressed bid proposal.
- H. All program and contract administration costs must be spelled out, including subcontracting, managing, documentation, containment, reporting, installation, delivery, service, maintenance, material and consumables, and replacement costs. The Owner will not accept hidden costs or fees not otherwise documented.

### 3.7 BID MODIFICATION AND WITHDRAWAL

- A. Bid may NOT be modified, withdrawn, or canceled for sixty (60) days after date of bid opening.
- B. Prior to bid date and time, Bidder may modify, cancel, withdraw and/or resubmit his bid in person or by signed, written notice. Notice must be mailed to party receiving bids, in confirming envelope, post-marked before date and time of receipt of bids. Modification of bids may require modification of bid security.

### 3.8 GUARANTY BONDS AND INSURANCE

- A. The Contractor, before commencing the Work, is required to furnish a Performance Bond and a Labor and Material Payment Bond.

The Performance Bond shall be in an amount equal to 100 percent of the full amount of the Contract Sum as security for the faithful performance of the obligations of the Contract Documents, and the Labor and Material Payment Bond shall be in an amount equal to 100 percent of the full amount of the Contract Sum as Security for the payment of all persons performing labor and furnishing materials in connection with the Contract Documents. Such bond shall be on A.I.A. Document A-311, issued by the American Institute of Architects, shall be issued by a surety satisfactory to the Owner and shall

name the Owner as primary co-obligee. Labor and Material Bonds shall comply with Public Act 213 of 1963. Performance Bonds shall comply with Public Act 32 of 1956 and all amendments. Bonds containing Stature of Limitations or time limitation will NOT be acceptable. All bonds shall be underwritten by companies authorized to do business in the State of Michigan.

- B. Refer to Section 007300 Supplementary Conditions for additional requirements.

### 3.9 SELECTION OF SUCCESSFUL BIDDER AND CONTRACT AWARD

- A. Owner reserves the right to waive bid irregularities and to accept the bid in the Owner's best interest and to award to other than the low bid.
- B. Owner reserves the right to reject any or all bids where incomplete or irregular, lacking bid bond, data required by bidding documents, or where proposals exceed funds available.
- A. The Owner will consider the qualification and experience of the Bidder and the amount of the bid when determining the award of the contract.
- B. If requested, the Bidders under consideration for award of contract shall submit a contractor's solvency qualification statement.
- C. Before award of contract, considered Bidder will be notified in writing if the Owner has reasonable objection to a person or entity proposed by Bidder. Bidder may then withdraw bid, or submit substitute person or entity together with adjustment in bid for Owner's acceptance or disqualification. In event of withdrawal by Bidder or disqualification by Owner, bid security will not be forfeited.
- D. Sub-contracts, material and equipment contract shall not be awarded until they have been accepted by the Owner.
- E. This bid in no manner obligates the Owner to the eventual contract for any items described, implied, or which may be proposed, until confirmed by written agreement issued by the Purchasing Department and may be terminated by the Owner without penalty or obligation at any time prior the issuance of an award.

### 3.10 ADDITIONAL WORK

- A. All requests for work that will require additional payment beyond the original scope of work must be submitted to the Owner's PM prior to execution of the work. Failure to obtain advanced written approval may result in non-payment.

### 3.11 PREVAILING WAGE REQUIREMENT- this is **NOT** a prevailing wage project.

### 3.12 INSURANCE REQUIREMENTS

- A. Refer to Section 00 7300 Supplementary Conditions for requirements.
- B. Contractor agrees to provide the following **minimum insurance coverage**:
  - 1. Worker's compensation insurance at the current statutory limits
  - 2. Employer's liability insurance, in conjunction with worker's compensation insurance, for claims for damages because of bodily injury, occupational sickness or disease or death of an employee when worker's compensation may not be an exclusive remedy, subject to a limit of liability of not less than \$1,000,000.

3. Commercial general liability insurance for claims for damages because of bodily injury or death of any person, other than the contractor's employees, or damage to tangible property of others, including loss of use resulting there from, to the extent that such kinds of liability are not insured by other specific liability insurance and are ordinarily insurable under commercial general liability insurance, subject to bodily injury limits of not less than \$1,000,000; personal injury coverage limits of not less than \$1,000,000; property damage limits of not less than \$1,000,000; and sexual abuse, sexual molestation and sexual misconduct coverage subject to limits of not less than \$1,000,000; or combined bodily injury/property damage/sexual abuse, sexual molestation and sexual misconduct of not less than \$5,000,000. A combination of primary and/or umbrella/excess policies may be utilized.
4. Contractual liability insurance of not less than \$1,000,000 for claims concerning indemnification for errors, omissions or negligent acts in the course of the professional service or other provision within this contract to the extent that such kinds of contractual liability are insurable.
5. Policies must be primary.
6. Contractor must furnish to the Owner, certificates of insurance evidencing the above coverage and additional insurance requirements in Section 007300 Supplementary Conditions. Certificates must be provided before contractor commences contract duties and prior to each policy renewal, or contract duties will not be allowed to commence or continue.
7. Certificates of insurance relating to the policies required under this award must contain the following words: "It is agreed that this insurance will not be canceled, not renewed or the limits of coverage in any way reduced without providing a minimum of thirty [30] days advance written notice and ten [10] days for non-payment of premium emailed to: Troy Kierczynski, [tkierczynski@nmc.edu](mailto:tkierczynski@nmc.edu)
8. Proof of such policies must be provided to the Buyer prior to the commencement of any work.
9. Contractor waives any and all rights of subrogation, with regard to property insurance, against Owner.

### 3.13 ADDITIONAL TERMS & CONDITIONS

- A. The Contractor, and the agents and employees of the Contractor, in the performance of this agreement, shall act in an independent capacity and not as officers, employees, or agents of the Owner.
- B. Upon request Contractor will provide the Owner with Material Safety Data Sheets [MSDS] for all chemicals, glues, cleaning solvents, etc. used in the building prior to, during or following the work to be performed. Such sheets shall be submitted to the following email address: [pquinlan@nmc.edu](mailto:pquinlan@nmc.edu)
- C. Contractors who must access a confined space or permit-required confined space to fulfill the service they provide to the Owner must submit a current confined space training program, and/or a permit [for permit-required confined space entry] to the Owner's Project Manager.
- D. Access to confined spaces and permit-required confined spaces will only be given after a notice to enter has been given to the Owner's Project Manager, and only then after [s]he has confirmed receipt of the contractor's current confined space training program and/or permit.
- E. Owner will not pay for any information requested herein, nor is it liable for any costs incurred by the contractor in responding to this request. Submitted proposals will not be

returned and may be subject to the Freedom of Information Act.

- F. The Contractor agrees to indemnify, defend and hold harmless the Owner, its officers, agents and employees from any and all claims and losses accruing or resulting to any and all Contractors, subcontractors, material persons, laborers and any other person, firm or corporation furnishing or supplying work, services, materials or supplies in connection with the performance of this contract; from any and all claims and losses accruing or resulting to any person, firm or corporation who may be injured or damaged by the Contractor in the performance of this agreement; or from any misrepresentation or breach of warranty by the Contractor.
- G. The contractor shall be responsible for maintaining satisfactory standards of employees' competency, conduct, courtesy, language, appearance, honesty, and integrity, and shall be responsible for taking such disciplinary action with respect to any employee, as may be necessary. The Owner may request the contractor to immediately remove from this assignment any employee found unfit to perform duties due to one or more of the following reasons:
  - 1. Neglect of duty
  - 2. Disorderly conduct, use of abusive or offensive language, quarreling, intimidation by words or actions or fighting
  - 3. Theft, vandalism, immoral conduct or any other criminal action
  - 4. Smoking or tobacco use
  - 5. Selling, consuming, possessing, or being under the influence of intoxicants, including alcohol, or illegal substances while on assignment for the Owner.
- H. The Contractor shall be responsible to the Owner for the acts and omissions of all his/her employees and all Subcontractors, their agents and employees, and all other persons performing any of the work under a contract with the Contractor.
- I. The Owner shall have the right to terminate the award with the Contractor without penalty pursuant to seven (7) days written notice of termination to the Contractor under the following circumstances:
  - 1. Default of Contractor - It shall be considered a default whenever the Contractor shall:
    - a. Disregard or violate the material provisions of the contract documents or College instructions; violate applicable law, regulation or guidance of any governmental authority; present an unreasonable risk of personal injury or property damage; or failure to execute the work according to the agreed schedule of completion and/or time of completion specified, including extensions thereof or fail to reach agreed upon performance results.
    - b. Declare bankruptcy, become insolvent, or assign company assets for the benefit of credits.
  - 2. Lack of Funds of the Owner - Lack of funds shall be construed to mean when the Owner, in the judgment of its Chief Financial Officer, determines that it cannot continue the funding of its contract services, without undue hardship to the Owner.
  - 3. Termination of contract services will be rendered if it is construed by the Owner to be in its best interests for serving the community and its students, faculty, and staff.

Any different or additional terms and conditions contained in the Contractor's acknowledgement forms or documents furnished by the Contractor are rejected by the Buyer and are not a part of the agreement between the parties.

**END OF SECTION 00 21 13**

**SECTION 00 41 00**  
**BID FORM**

**THE PROJECT AND THE PARTIES****TO:**

Owner: Northwestern Michigan College, 1701 E. Front St. Traverse City, MI 49686

**FOR:**

NMC Foundation Offices Renovation; Project No. 26.513

**DATE:** \_\_\_\_\_ (Bidder to enter date)

**SUBMITTED BY:** (Bidder to enter name and address)

Bidder's Full Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

**OFFER**

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by the Architect for the above-mentioned projects, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

\_\_\_\_\_ dollars

(\$ \_\_\_\_\_), in lawful money of the United States of America.

All applicable federal taxes are included and State of Michigan taxes are included in the Bid Sum.

**ACCEPTANCE**

This offer shall be open to acceptance and is irrevocable for **sixty days (60)** from the bid closing date.

If this bid is accepted by Owner within the time period stated above, we will:

Execute the Agreement within seven days of receipt of Notice of Award.  
Furnish the required bonds within seven days of receipt of Notice of Award.  
Commence work within seven days after written Notice to Proceed of this bid.

**CONTRACT TIME**

Complete the Work by date established for Substantial Completion in Section 00 73 00 - Supplementary Conditions.

**CHANGES TO THE WORK**

Refer to Document 00 73 00 - Supplementary Conditions for net cost plus the percentage fee amount for overhead and profit on additional work and work deleted from the project.

**ADDENDA**

The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

Addendum # \_\_\_\_\_ Dated \_\_\_\_\_. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.  
Addendum # \_\_\_\_\_ Dated \_\_\_\_\_. Addendum # \_\_\_\_\_ Dated \_\_\_\_\_.

**BID FORM SUPPLEMENTS****Forms and Attachments**

1. Statement of Familial Relationship Form is provided with this Bid (Section 00 45 50)
2. Certification of Iran Economic Sanctions Act Form is provided with this Bid (Section 00 45 51)
3. Provide any voluntary alternates as an attachment to this bid form

The following Supplements and names of key Subcontractors, are attached to this Bid Form and listed below, and are considered an integral part of this Bid Form and submitted as part of the bid:

Name of Mechanical Contractor: \_\_\_\_\_

Name of Electrical Contractor: \_\_\_\_\_

We agree to submit the following Supplements to Bid Forms within 24 hours after submission of this bid for additional bid information:

Document 00 43 30 - Supplement B – Subcontractors: Include the names of all Subcontractors and the portions of the Work they will perform.

**BID FORM SIGNATURE(S)**

The Corporate Seal of

---

*(Bidder - print the full name of your firm)  
was hereunto affixed in the presence of:*

---

*(Authorized signing officer, Title, Seal)*

---

*(Authorized signing officer, Title)*

If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

**END OF 00 41 00 – BID FORM**

**SECTION 00 43 00**  
**SUPPLEMENTS TO BID FORM PARTICULARS**

TO: Northwestern Michigan College  
Project: NMC Foundation Offices Renovation; Project No. 26.513  
Date: \_\_\_\_\_  
Submitted by: \_\_\_\_\_  
(Bidder to insert full name and address)

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In accordance with Section 00 21 13 - Instructions to Bidders; and Section 00 41 00 - Bid Form, we include the Supplements to Bid Form listed below. The information provided shall be considered an integral part of the Bid Form.

**SUPPLEMENTS TO BID FORM**

Supplement B - List of Subcontractors

[Document 00 43 30]

**SIGNATURE(S)**

The Corporate Seal of

\_\_\_\_\_  
(Bidder please print the full name of your Proprietorship, Partnership, or Corporation)  
was hereunto affixed in the presence of:

\_\_\_\_\_  
(Authorized signing officer Title)  
(Seal)

\_\_\_\_\_  
(Authorized signing officer Title)  
(Seal)

**END OF 00 43 00 - SUPPLEMENTS TO BID FORM**

**SECTION 00 43 30**

## SUPPLEMENT B - LIST OF SUBCONTRACTORS

## PARTICULARS

Herewith is the list of Subcontractors referenced in the bid submitted by:

(Bidder) \_\_\_\_\_

To: Northwestern Michigan college

Dated \_\_\_\_\_ and which is an integral part of the Bid Form.

The following work will be performed (or provided) by Subcontractors and coordinated by us:

## LIST OF SUBCONTRACTORS

[illegible]

**END OF 00 43 30 - SUPPLEMENT B**

**SECTION 00 45 50**  
**STATEMENT REGARDING FAMILIAL RELATIONSHIP**

I am the \_\_\_\_\_ of \_\_\_\_\_, a bidder on a  
(Title) (Company Name)  
construction project for **Northwestern Michigan College**.

- ☐ I have personal knowledge and/or I have personally verified that the following are all of the familial relationships existing between the owner(s) and employee(s) of the aforementioned contractor.

The following are the familial relationship(s):

| Owner / Employee Name | Related to: | Relationship |
|-----------------------|-------------|--------------|
| 1. _____              | _____       | _____        |
| 2. _____              | _____       | _____        |
| 3. _____              | _____       | _____        |
| 4. _____              | _____       | _____        |
| 5. _____              | _____       | _____        |

*(Attach additional pages if necessary to disclose familial relationships)*

I have authority to bind the aforementioned contractor with the representations contained herein, and I am fully aware that the owner will rely on my representations in evaluating bids for the construction project.

- ☐ There is no familial relationship that exists between the owner(s) and employee(s) of the aforementioned contractor.

BIDDER'S FIRM NAME \_\_\_\_\_

BY (SIGNATURE) \_\_\_\_\_

PRINTED NAME AND TITLE

Subscribed and sworn before me, this \_\_\_\_\_ Seal:

day of \_\_\_\_\_, 2023, a Notary Public

In and for \_\_\_\_\_ County, \_\_\_\_\_

Signature \_\_\_\_\_

My commission expires \_\_\_\_\_

**END OF SECTION 00 45 50**

**SECTION 00 45 51**  
**IRAN ECONOMIC SANCTIONS ACT CERTIFICATION**

I am the \_\_\_\_\_ of \_\_\_\_\_, a bidder on a  
(Title) (Company Name)

construction / improvement project for **Northwestern Michigan College.**

I have authority to bind the aforementioned contractor with the representations contained herein, and I am fully aware that the school district will rely on my representations in evaluating bids

I have knowledge of the matters described in this Certification, and I am familiar with the Iran Economic Sanctions Act, MCL 129.311, *et seq.* ("Act").

I certify that this Bidder or any subcontractors to this Bidder is not an Iran-linked business, as that term is defined in the Act.

I understand that submission of a false certification may result in contract termination, ineligibility to bid for three (3) years, and a civil penalty of \$250,000 or twice the bid amount, whichever is greater, plus related investigation and legal costs.

BIDDER'S FIRM NAME \_\_\_\_\_

BY (SIGNATURE) \_\_\_\_\_

PRINTED NAME AND TITLE \_\_\_\_\_

Subscribed and sworn before me, this \_\_\_\_\_ Seal:

day of \_\_\_\_\_, 2023, a Notary Public

In and for \_\_\_\_\_ County, \_\_\_\_\_

---

Signature

My commission expires \_\_\_\_\_

END OF SECTION 00 45 51

**SECTION 00 52 13**

**AGREEMENT**

**FORM OF AGREEMENT**

- A. Type of Contract
  - 1. Project will be constructed under a single prime contract.
  - 2. The Contract form of agreement between the Owner and Contractor shall be: according to **AIA document A104-2017**. (*Standard Abbreviated Form of Agreement Between the Owner and Contractor*)

**END OF SECTION 00 52 13**

**SECTION 00 72 00**  
**GENERAL CONDITIONS**

**FORM OF GENERAL CONDITIONS**

**AIA Document A201-2017**, General Conditions of the Contract for Construction, 2017 Edition, is the General Conditions between the Owner and Contractor.

Copies of *AIA Document A201-2017* may be purchased and downloaded by interested parties from the following:

**American Institute of Architects US** <https://documentsondemand.aia.org>

**SUPPLEMENTARY CONDITIONS**

Refer to Section 00 73 00 for amendments to these General Conditions.

**END OF 00 72 00 - GENERAL CONDITIONS**

**SECTION 00 73 00****SUPPLEMENTARY CONDITIONS**

The following supplements modify the "General Conditions of the Contract for Construction", AIA Document A201, 2017. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

**ARTICLE 1; GENERAL PROVISIONS**

Add the following Subparagraph 1.2.1.1 to 1.2:

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

1. The Agreement.
2. Addenda, with those of later date having precedence over those of earlier date.
3. The Supplementary Conditions.
4. The General Conditions of the Contract for Construction.
5. Drawings and Specifications.

In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

**ARTICLE 3; CONTRACTOR****3.4 LABOR AND MATERIALS**

Add the following Subparagraphs 3.4.4 and 3.4.5 to 3.4:

3.4.4 After the Contract has been executed, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 1 of the Specifications).

3.4.5 By making requests for substitutions based on Subparagraph 3.4.4 above, the Contractor:

1. Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
2. Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
3. Certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's or Engineer's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and
4. Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

Add the following subparagraph 3.18.1.1 to 3.18:

3.18.1.1 The foregoing Subparagraph shall, but not by way of limitation, specifically include all claims and judgments which may be made against the Owner, Architect, Architect's consultants, and agents and employees of any of them under the governing laws of the state in which this construction is conducted, and similar laws of other state or governmental body having jurisdiction; and further, against claims and judgments arising from violations of public ordinances and requirements of governing authorities due to the Contractor's or Subcontractor's method of execution of the work.

Delete subparagraph 3.18.2 and substitute the following:

3.18.2 The indemnification which the Contractor and Subcontractors are to provide under Paragraph 3.18 shall include, extend and insure to and be for the benefit of the Owner, Architect, Architect's consultants, their respective agents, and employees of any of them, and shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under Worker's Compensation or Employer's Liability Acts, disability acts, employee benefit acts or other legislation or rule of law, whether legislative, judicial, administrative or common law.

## **ARTICLE 5; SUBCONTRACTORS**

### **5.3 SUBCONTRACTURAL RELATIONS**

Add the following subparagraph 5.3.2 to 5.3:

5.3.2 The Subcontractor agrees, to the fullest extent permitted by law, to indemnify, save harmless and defend the Contractor, Owner, Architect, Architect's consultants, their respective agents, and employees of any of them harmless from any liability for damages to any person or property upon, or at, or about the project, that may arise as a result of or in connection with the work hereunder, provided, however, that the Subcontractor shall not be required to indemnify the Contractor against the Contractor's sole negligence; and the Subcontractor agrees to procure at his own expense, before the commencement of the work comprehensive general liability including contractor's protective liability insurance, completed operations and contractual liability insurance and automobile liability insurance, including the ownership, maintenance, and operation of any automotive equipment owned, hired and non-owned for the benefit of the Contractor and Owner, for damages resulting to persons, and for damages to property arising out of each casualty, and to keep such insurance in force until the construction of the project is fully completed, and to immediately and before commencing work deliver such policy or policies or certificates of such insurance to the Contractor.

## **ARTICLE 9; PAYMENTS AND COMPLETION**

### **9.3 APPLICATIONS FOR PAYMENT**

Add the following subparagraphs 9.3.1.3 and 9.3.1.4 to 9.3:

9.3.1.3 Until final payment, the Owner will pay ninety percent of the amount due the Contractor on account of progress payments.

9.3.1.4 The full Contract retainage may be reinstated if the manner of completion of the Work and its progress do not remain satisfactory to the Architect (or if the Surety withholds its consent), or for other good and sufficient reasons.

Add clause to subparagraph 9.5.1

9.5.1.8 Unsatisfactory cleanup in accordance with subparagraph 3.15.

### **9.6 PROGRESS PAYMENTS**

Add the following subparagraph 9.6.8 to 9.6:

9.6.8 Should the contractor fail to complete his contract work by the completion date as stated in his contract, the Owner will suspend all further payments on the contract, until all work on the contract is substantially completed and has been accepted by the Owner. If no completion date is stated in the contract, then this paragraph shall be omitted entirely.

Add clause to subparagraph 9.10.4

9.10.4.4 Latent defects appearing during or beyond the warranty period.

**ARTICLE 11; INSURANCES AND BONDS****11.1 CONTRACTOR'S LIABILITY INSURANCE**

Delete subparagraph 11.1.2 and substitute the following:

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents, or required by law, whichever coverage is greater. Coverage, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment. Notwithstanding the above, the insurance required by paragraph 11.1 shall be on an occurrence basis.

Add the following subparagraph:

11.1.2.1 Such insurance shall be carried with companies authorized to do business in the State of Michigan and written to include the following coverage and for not less than the following minimum limits or greater if required by law:

.1 Worker's Compensation, Occupational Disease and Employer's Liability Insurance:

- A. State; Michigan - Statutory limits.
- B. Applicable Federal (if any) - Statutory limits.
- C. Employer's Liability -

|                             |                                  |
|-----------------------------|----------------------------------|
| Bodily Injury by Accident - | \$1,000,000.00 each accident     |
| Bodily Injury by Disease -  | \$1,000,000.00 each employee     |
| Bodily Injury by Disease -  | \$1,000,000.00 each policy limit |

.2 Commercial General Liability Insurance including as minimum coverage:

- Premises - Operations Liability
- Independent Contractor's Protective Liability
- Products and Completed Operations Liability
- Broad Form Property Damage Endorsement
- Blanket Contractual
- Personal Injury

A. Special Requirements:

1. Property Damage Liability Insurance will provide "X, C, and U" (Explosion, collapse and underground hazard) coverage as applicable.
2. Products and Completed Operations to be maintained for one (1) year after final payment.
3. The Owner, Architect, their consultants, agents and employees shall be named as "additional insured" on the commercial general liability policy of the general contractor and/or subcontractor of any tier.

B. Limits of Liability:

\$1,000,000.00 Each occurrence as respects Bodily Injury Liability or Property

|                |                                         |
|----------------|-----------------------------------------|
|                | Damage Liability, or both combined.     |
| \$2,000,000.00 | General Aggregate                       |
| \$1,000,000.00 | Products/Completed Operations Aggregate |
| \$1,000,000.00 | Personal and Advertising Injury         |

.3 Automobile Liability Insurance:

A. The State of Michigan has a no-fault automobile insurance requirement. Contractors shall be certain coverage is provided which conforms to any specific stipulation in the law.

B. Special Requirements:

1. All owned, hired, and non-owned vehicles including the loading or unloading thereof.

B. Limits of Liability:

|                |                                                                                                     |
|----------------|-----------------------------------------------------------------------------------------------------|
| \$1,000,000.00 | Each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined. |
|----------------|-----------------------------------------------------------------------------------------------------|

.4 Umbrella/Excess Liability Insurance:

A. Limits of Liability

|                |                 |
|----------------|-----------------|
| \$5,000,000.00 | Each Occurrence |
| \$5,000,000.00 | Aggregate       |

Delete subparagraph 11.1.3 and substitute the following:

11.1.3 Certificates of Insurance for the above coverage shall be submitted to the Architect for transmittal to the Owner for his approval prior to the start of construction. The Contractor shall certify to the Owner that he has obtained or will obtain similar certificates of insurance from each of his Subcontractors before their work commences. Each Subcontractor must be covered by insurance of the same character and in the same amounts as the Contractor unless the Contractor and Owner agree that a reduced coverage is adequate. Each Subcontractor's insurance shall cover the Owner, Project Manager, Engineer, Engineer's consultants, their agents and employees. The Contractor shall submit a statement with each monthly affidavit stating that he has obtained certificates of insurance, or other satisfactory evidence, that all required insurance is in force for each of the Subcontractors listed on his affidavit. If the "additional insured" have other insurance which is applicable to the loss, it shall be on an excess or contingent basis.

The amount of the company's liability under this policy shall not be reduced by the existence of such other insurance. Contractors certificates shall be in duplicate on standard Accord forms.

Add the following Subparagraphs:

11.1.3.1 Certificate of Insurance shall contain a statement therein or a rider attached thereto incorporating the indemnity clause stated in Paragraph 3.18 (Indemnification) and Subparagraphs 3.18.1, 3.18.1.1 and 3.18.2 of the General Conditions, and including the changes and additions made in those subparagraphs within these Supplemental General Conditions.

11.1.3.2 These Certificates and the insurance policies required by this Paragraph 11.1 shall contain a provision that coverage afforded under the policies will not be canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner, Architect and Engineers. If any of the foregoing insurance coverage are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the

final Application for Payment as required by Subparagraph 9.10.2. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

11.1.3.3 The obligations of the Contractor under the provisions of this article shall not extend to the liability of the Engineer, his agents or employees arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications, or (2) the giving of or the failure to give directions or instructions by the Engineer, his agents or employees to the extent that such giving or failure to give is the cause of the injury or damage.

#### 11.4 PROPERTY INSURANCE

Delete subparagraph 11.4.1 and substitute the following:

11.4.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance in the amount of the initial Contract Sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary deductibles.

Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Paragraph 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Paragraph 11.3 to be covered, whichever is earlier. This insurance shall include interests of the Owner, Architect, the Contractor, Subcontractors and Sub-subcontractors in the Work.

Delete subparagraph 11.4.1.1 and substitute the following:

11.4.1.1 Property insurance shall be on all-risk policy form and shall insure against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, false-work, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Owner's services and expenses required as a result of such insured loss. Coverage for other perils shall not be required unless otherwise provided in the Contract Documents.

Property Insurance provided by Owners shall not cover any tools, apparatus, machinery, scaffolding, hoists, forms, staging, shoring and other similar items commonly referred to as construction equipment, which may be on the site and the capital value of which is not included in the Work. The Contractor shall make his own arrangements for any insurance he may require on such construction equipment.

Delete subparagraph 11.4.1.3 and substitute the following:

11.4.1.3 If the property insurance required minimum deductibles and such deductibles are identified in the Contract Documents, the Contractor shall pay costs not covered because of such deductibles. If the Owner or insurer increases the required minimum deductibles above the amounts identified or if the Owner elects to purchase this insurance with voluntary deductible amounts, the Owner shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles. If deductibles are not identified in the Contract Documents, the Owner shall pay costs not covered cause of deductibles.

Delete subparagraph 11.4.7 and substitute the following:

11.4.7 Waivers of Subrogation. If permitted by the Owner's and Contractor's insurance companies, without penalties, the Owner and Contractor waive all rights against (1) each other and any of their Subcontractors, Sub-subcontractors, agents and employees, each of the other, (2) the Architect, his employees and agents, and (3) the engineers, the engineer's consultants, separate contractors described

in Article 6, if any, and any of their Subcontractors, Sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Paragraph 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the Subcontractors Sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise.

A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

Add subparagraph 11.4.11:

Provisions of this paragraph, 11.4 shall not operate to relieve the Contractor of responsibility for loss or damage to Contractor's 'Property' of any kind or nature, whatsoever including but not limited to tools, equipment, forms, scaffolding and temporary structures, be said property owned by Contractor or Contractor's employees or agents, or rented by Contractor and owned by others. Property, as used herein shall include materials and/or equipment purchased by Contractor as part of Contractors work and slated for installation until said materials or equipment, or both are installed or become part of the completed work of Contractor. The Owner shall in no event be liable for loss or damage to the aforementioned items or any other property of the Contractor which is not included in the permanent construction.

## **11.5 PERFORMANCE BOND AND PAYMENT BOND**

Add subparagraph 11.5.3 to 11.5:

11.5.3 The Contractor, before commencing the Work, is required to furnish a Performance Bond and a Labor and Material Payment Bond.

The Performance Bond shall be in an amount equal to 100 percent of the full amount of the Contract Sum as security for the faithful performance of the obligations of the Contract Documents, and the Labor and Material Payment Bond shall be in an amount equal to 100 percent of the full amount of the Contract Sum as Security for the payment of all persons performing labor and furnishing materials in connection with the Contract Documents. Such bond shall be on A.I.A. Document A-311, issued by the American Institute of Architects, shall be issued by a surety satisfactory to the Owner and shall name the Owner as primary co-obligee. Labor and Material Bonds shall comply with Public Act 213 of 1963. Performance Bonds shall comply with Public Act 32 of 1956 and all amendments. Bonds containing Stature of Limitations or time limitation will **NOT** be acceptable. All bonds shall be underwritten by companies authorized to do business in the State of Michigan.

Add the following paragraph 11.6 to Article 11:

## **11.6 MISCELLANEOUS REQUIREMENTS**

11.6.1 All insurance coverage shall be provided by insurance companies having policy holder ratings no lower than "A" and financial ratings not lower than "XII" in the Best's Insurance Guide, latest edition in effect as of the date of the Contract.

11.6.2 The Contractor is responsible for determining that Subcontractors are adequately insured against claims arising out of or relating to the Work. The premium cost and charges for such insurance shall be paid by each Subcontractor.

11.6.3 The limits of liability as stated, may be arrived at using a Split-Limit or a Combined Single Limit basis. However, the total limit of liability shall not be less than that stated in the requirements.

**END OF SECTION 007300**

**SECTION 01 11 00****SUMMARY****PART 1 GENERAL****1.01 PROJECT**

- A. Project Name: NMC Foundation Offices Renovation
- B. Owner's Name: Northwestern Michigan College
- C. Architect's Name: Cornerstone Architects
- D. The project is:

Interior renovation of existing classroom space for new offices for the NMC Foundation which includes an open office area, individual office, kitchenette, and conference room.

The Project Scope include but is not limited to:

- Interior renovation in existing space including selective demolition of existing, modification to existing, and new construction work.
- Fire Alarm & Fire Suppression modification: design and installation.
- Electrical work: Demolition of existing lighting/power, new lighting/power, new emergency lighting
- Mechanical work: Demolition/modification of existing mechanical system/components and installation of new mechanical components
- Plumbing work: Demolition/modification of existing plumbing components, installation of new plumbing components

**1.02 CONTRACT DESCRIPTION**

- A. Contract Type: A single prime contract based on a Stipulated Sum Price as described in Section 00 52 13 - Agreement.

**1.03 DESCRIPTION OF WORK**

- A. General Construction: demolition, new construction, & interior renovation.
- B. Plumbing: demolition and renovation to existing
- C. HVAC: demolition and renovation to existing.
- D. Electrical Power and Lighting: demolition and renovation to existing.
- G. Fire Safety: Fire Alarm & Fire Suppression design and installation.

**1.04 OWNER SCHEDULE**

- A. Construction Start: Upon Board Approval on August 17<sup>th</sup>, 2026.
- B. Substantial Completion: Fall 2026

**1.05 OWNER OCCUPANCY**

- A. Owner intends to occupy the building where the project is location throughout construction.

- B. The classroom directly adjacent to the project area, GL122, will be occupied during the 2027 Fall school season and will be critical for the contractor to closely coordinate any loud/disruptive work with the Owner to work around the classroom's class schedule.
- C. Schedule the Work to accommodate Owner occupancy.

#### 1.06 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
- B. No Smoking on the premises of the property is allowed for the full duration of the project.
- C. Provide access to and from site as required by law and by Owner:
  - 1. Do not obstruct roadways, sidewalks, or other public ways without permit.
- D. Time Restrictions:
  - 1. Limit conduct of especially noisy exterior work to the hours of 9:00 am to 5:00 pm.
- E. Temporary Utilities
  - 1. General Contractor is responsible for provision and payment for temporary utilities during construction.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION - NOT USED**

**END OF SECTION 01 11 00**

**SECTION 01 20 00****PRICE AND PAYMENT PROCEDURES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

**1.02 RELATED SECTIONS**

- A. Document 00 72 00 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- B. Document 00 73 00 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.

**1.03 SCHEDULE OF VALUES**

- A. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet.
- B. Submit Schedule of Values in duplicate within 7 days after date of Owner-Contractor Agreement.
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization and bonds and insurance. Also identify administrative and procedural requirements, temporary facilities and controls, final cleaning, operation data, and list of Alternates.
- D. Include within each line item, a direct proportional amount of Contractor's overhead and profit.
- E. Revise schedule to list approved Change Orders, with each Application For Payment.

**1.04 APPLICATIONS FOR PROGRESS PAYMENTS**

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Present required information in typewritten form.
- C. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.
- D. Execute certification by signature of authorized officer.

- E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
- F. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- G. Submit a digital copy of Application for Payment.
- H. Include the following with the application:
  - 1. Transmittal letter as specified for Submittals in Section 01 30 00.
  - 2. Construction progress schedule, revised and current as specified in Section 01 30 00.
  - 3. Partial release of liens from major Subcontractors and vendors.
  - 4. Affidavits attesting to off-site stored products.
  - 5. Contractor's Reuse, Recycling, and Disposal Report in Section 01 74 19.
- I. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

#### 1.05 MODIFICATION PROCEDURES

- A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.
- B. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710.
- C. Construction Change Directive: Architect may issue a document, signed by Owner, instructing Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - 1. The document will describe changes in the Work, and will designate method of determining any change in Contract Sum or Contract Time.
  - 2. Promptly execute the change in Work.
- D. Proposal Request: Architect may issue a document which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 7 days.
- E. Contractor may propose a change by submitting a Request for Change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.
- F. Computation of Change in Contract Amount:
  - 1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
  - 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.

3. For pre-determined unit prices and quantities, the amount is based on the fixed unit prices.
  4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
- G. Substantiation of Costs: Provide full information required for evaluation.
1. Provide following data:
    - a. Quantities of products, labor, and equipment.
    - b. Taxes, insurance, and bonds.
    - c. Overhead and profit.
    - d. Justification for any change in Contract Time.
    - e. Credit for deletions from Contract, similarly documented.
  2. Support each claim for additional costs with additional information:
    - a. Origin and date of claim.
    - b. Dates and times work was performed, and by whom.
    - c. Time records and wage rates paid.
    - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
  3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract on AIA G701.
- I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- K. Promptly enter changes in Project Record Documents.

#### 1.06 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
  1. Closeout procedures specified in Section 01 78 00.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION - NOT USED**

**END OF SECTION 01 20 00**

**SECTION 01 30 00****ADMINISTRATIVE REQUIREMENTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Pre-Construction meeting.
- B. Site mobilization meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Progress photographs.
- F. Coordination drawings.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. Submittal procedures.

**1.02 RELATED SECTIONS**

- A. Section 01 70 00 - Execution Requirements: Additional coordination requirements.
- B. Section 01 78 00 - Closeout Submittals: Project record documents.

**1.03 PROJECT COORDINATION**

- A. Project Coordinator: General Contractor.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for vehicular access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
  - 1. Requests for interpretation.
  - 2. Requests for substitution.
  - 3. Shop drawings, product data, and samples.
  - 4. Test and inspection reports.
  - 5. Manufacturer's instructions and field reports.
  - 6. Applications for payment and change order requests.
  - 7. Progress schedules.
  - 8. Coordination drawings.
  - 9. Closeout submittals.

**PART 2 PRODUCTS - NOT USED****PART 3 EXECUTION****3.01 PRECONSTRUCTION MEETING**

- A. Architect will schedule a meeting after Notice of Award.
- B. Attendance Required:
  - 1. Owner.
  - 2. Architect.
  - 3. Contractor.
  - 4. Mechanical Sub-Contractor.
  - 5. Electrical Sub-Contractor.
- C. Agenda:
  - 1. Execution of Owner-Contractor Agreement.
  - 2. Submission of executed bonds and insurance certificates.
  - 3. Distribution of Contract Documents.
  - 4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
  - 5. Designation of personnel representing the parties to Contract, Contractor and Architect.
  - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract Closeout procedures.
  - 7. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

**3.02 SITE MOBILIZATION MEETING**

- A. Architect will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
  - 1. Contractor.
  - 2. Owner.
  - 3. Architect.
  - 4. Contractor's Superintendent.
  - 5. Major Subcontractors.
- C. Agenda:
  - 1. Use of premises by Owner and Contractor.
  - 2. Owner's requirements and partial occupancy prior to completion.
  - 3. Construction facilities and controls provided by Owner.
  - 4. Temporary utilities should be included in contract.
  - 5. Survey and building layout.
  - 6. Security and housekeeping procedures.
  - 7. Schedules.
  - 8. Application for payment procedures.
  - 9. Procedures for testing.
  - 10. Procedures for maintaining record documents.
  - 11. Requirements for start-up of equipment.
  - 12. Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### 3.03 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum two week intervals.
- B. Make arrangements for meetings; prepare agenda with copies for participants; preside at meetings.
- C. Attendance required, as appropriate to agenda topics for each meeting:
  - 1. Job superintendent
  - 2. Major Subcontractors and suppliers
  - 3. Owner
  - 4. Architect
- D. Agenda:
  - 1. Review minutes of previous meetings.
  - 2. Review of Work progress.
  - 3. Field observations, problems, and decisions.
  - 4. Identification of problems which impede planned progress.
  - 5. Review of submittals schedule and status of submittals.
  - 6. Review of off-site fabrication and delivery schedules.
  - 7. Maintenance of progress schedule.
  - 8. Corrective measures to regain projected schedules.
  - 9. Planned progress during succeeding work period.
  - 10. Coordination of projected progress.
  - 11. Maintenance of quality and work standards.
  - 12. Effect of proposed changes on progress schedule and coordination.
  - 13. Other business relating to Work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### 3.05 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 7 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 14 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
  - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.

### 3.06 COORDINATION DRAWINGS

- A. Provide information required by Project Coordinator for preparation of coordination drawings.
- B. Review drawings prior to submission to Architect.

### 3.08 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
1. Product data.
    - a. When product data submittals are prepared specifically for this project (in the absence of standard printed information) submit such information as shop drawings and not as product data submittals.
    - b. Content:
      - 1) Submit manufacturer's standard printed data sheets.
      - 2) Identify the particular product being submitted; submit only pertinent pages.
      - 3) Identify which options and accessories are applicable.
      - 4) Show compliance with the specific standards referenced.
      - 5) Show compliance with specified testing agency listings; show the limitations of the labels or seals, if any.
      - 6) Identify dimensions which have been verified by field measurement.
      - 7) Each copy of each such item shall be provided with clear space for application of Architect's/Engineer's acceptance/rejection stamp.
  2. Shop drawings.
    - a. Content: Include the following information:
      - 1) Clearly mark drawing with name of Architect/Engineer, project name and number, name of contractor and of supplier if same is not manufacturer of material.
      - 2) All field measurements that have been taken, at accurate scale.
      - 3) Names of specific products and materials used.
      - 4) Identify specification section where item/product is specified by Architect/Engineer.
      - 5) Details, identified by contract document sheet and detail numbers.
      - 6) Coordination requirements; show relationship to adjacent or critical work.
    - b. Preparation:
      - 1) Reproductions of contract documents are not acceptable as shop drawings.
      - 2) Space for architect's action marking shall be adjacent to the title block.
  3. Samples for selection.
    - a. Samples:
      - 1) Provide samples that are the same as proposed product.
      - 2) If, due to manufacturing tolerances, a quantity of a particular item is required to properly illustrate full range of color, texture or other variation that may be expected in finished work, such quantity shall be provided in duplicate
        - (a) Preparation:
          - (1) Samples shall be submitted for all items as requested by various specification sections. In addition, Architect/Engineer reserves the right to require samples of materials of workmanship when deemed necessary for review, even though samples may not have been required of material specified.
          - (2) Samples shall be submitted in duplicate, unless otherwise specified for a particular item under individual specification section.
          - (3) Each sample shall be clearly identified on tag attached, showing name of Architect/Engineer, project number and title, names of contractor, manufacturer (an supplier if same is not manufacturer), brand name or number identification, pattern color or finish designation and location in work.
  4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with submittal procedures article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

### 3.08 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
  - 1. Design data.
  - 2. Certificates.
  - 3. Test reports.
  - 4. Inspection reports.
  - 5. Manufacturer's instructions.
  - 6. Manufacturer's field reports.
  - 7. Other types indicated
- B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

### 3.09 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
  - 1. Project record documents.
  - 2. Operation and maintenance data.
  - 3. Warranties.
  - 4. Bonds.
  - 5. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

### 3.10 NUMBER OF COPIES OF SUBMITTALS

- A. Documents for Review:
  - 1. Please submit via email or construction management software in PDF format to Architect for review
  - 2. Samples:
    - a. 2 sets or items of each.
    - b. 1 set or item will be returned.
    - c. If additional sets are needed by other entities involved in work represented by the samples, submit with original submittal.
    - d. Copies in excess of the number requested, will not be returned.
- B. Documents for Information: Submit two copies.
- C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.
- D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
  - 1. After review, produce duplicates.
  - 2. Retained samples will not be returned to Contractor unless specifically so stated.

### 3.11 COORDINATION OF SUBMITTALS

- A. Submittals for activities that must be performed in sequence, coordinate submittals so that the architect has all the required information to properly review the submittals.

### 3.12 SUBMITTAL PROCEDURES

- A. Transmit each submittal with approved form.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- E. Deliver submittals to Architect at business address.
- F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
- G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- H. Provide space for Contractor and Architect review stamps.
- I. When revised for resubmission, identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- K. Submittals not requested will not be recognized or processed.
- L. Submittals will be reviewed, marked with appropriate action, and returned.
  - 1. Stamped "action" markings:
    - a. "Reviewed" action: Submittal has been reviewed for compliance with construction documents, no additional action necessary.
    - b. "Reviewed as Noted" action: Submittal - according to Architect's review markings - has been reviewed and "marked up" for compliance with construction documents.
    - c. "Revise and Resubmit" action: Revise the submittal or prepare a new submittal complying with the comments made. Do not proceed with work items as shown on the submittal until a "revised and resubmitted" submittal has been reviewed for compliance with construction documents by the Architect.

**END OF SECTION 01 30 00**

**SECTION 01 40 00**  
**QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Quality assurance submittals.
- B. Independent Testing.
- C. Special Inspections.
- D. Mock-ups.
- E. Control of installation.
- F. Tolerances.
- G. Testing and inspection services.
- H. Manufacturers' field services.
- I. Defect assessment.

**1.02 RELATED SECTIONS**

- A. Section 00 72 00 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- C. Section 01 42 19 - Reference Standards.
- D. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

**1.03 REFERENCES**

- A. ASTM C 1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2001.
- B. ASTM C 1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2005.
- C. ASTM C 1093 - Standard Practice for Accreditation of Testing Agencies for Unit Masonry; 1995 (Reapproved 2001).
- D. ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2004a.
- E. ASTM E 329 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction; 2005.
- F. ASTM E 543 - Standard Practice for Agencies Performing Nondestructive Testing; 2004.

## 1.04 QUALITY ASSURANCE SUBMITTALS

- A. Testing Agency Qualifications:
  - 1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
  - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- B. Design Data: Submit for Architect's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
  - 1. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of inspector.
    - d. Date and time of sampling or inspection.
    - e. Identification of product and specifications section.
    - f. Location in the Project.
    - g. Type of test/inspection.
    - h. Date of test/inspection.
    - i. Results of test/inspection.
    - j. Conformance with Contract Documents.
    - k. When requested by Architect, provide interpretation of results.
  - 2. Test reports are submitted for Architect's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
  - 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
  - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
  - 1. Submit report in duplicate within 30 days of observation to Architect for information.
  - 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
  - 1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
  - 2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

- H. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either the National Bureau of Standards (NBS) standards or to accepted values of natural physical constants.

#### 1.05 TESTING AND INSPECTION SERVICES

- A. Owner will employ and pay for services of an independent testing agency to perform specified testing and inspection.
- B. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- D. Contractor Employed Agency:
  - 1. Testing agency: Comply with requirements of ASTM E 329, ASTM E 543, ASTM C 1021, ASTM C 1077, and ASTM C 1093.
  - 2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
  - 3. Laboratory: Authorized to operate in the State in which the Project is located.
  - 4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
  - 5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

#### 1.06 INDEPENDENT TESTING

- A. Independent testing agencies, whether employed by the Owner or the Contractor, may not change the requirements of the contract documents and may not approve any portion of the work.
  - 1. Soils engineer will have authority to approve or disapprove of all soil materials to be used, compactions reached, etc. on this project.
- B. Employment of testing agencies, by the Contractor or the Owner, shall not relieve the Contractor of his obligation to perform the work in accordance with the contract documents.

#### 1.07 SPECIAL INSPECTIONS

- A. Special inspections as required by Michigan Building Code, 2015 edition, section 1704 will be paid for by the Owner. The contractor will be required to coordinate the testing schedule, timing, etc.
  - a. Structural Steel
  - b. Cast-in-Place Concrete
  - c. Cold-Formed Metal Framing
  - d. Soilds
  - e. Fire Protection

### PART 2 PRODUCTS

#### 2.01 GENERAL

- A. Asbestos: No asbestos containing materials have been specified for this project. No asbestos containing building materials or other materials shall be used or installed in the completion of this project. Contractors shall be responsible to provide, as requested, material safety data sheets for all materials used.

**PART 3 EXECUTION****3.01 CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

**3.02 MOCK-UPS**

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

**3.03 TOLERANCES**

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

**3.04 TESTING AND INSPECTION SERVICES**

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
  - 1. Test samples of mixes submitted by Contractor.
  - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.

3. Perform specified sampling and testing of products in accordance with specified standards.
  4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
  5. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
  6. Perform additional tests and inspections required by Architect.
  7. Submit reports of all tests/inspections specified.
- C. Limits on Testing and Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
  2. Agency may not approve or accept any portion of the Work.
  3. Agency may not assume any duties of Contractor.
  4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
  2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
  3. Provide incidental labor and facilities:
    - a. To provide access to Work to be tested/inspected.
    - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
    - c. To facilitate tests/inspections.
    - d. To provide storage and curing of test samples.
  1. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
  2. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
  3. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for retesting will be charged to the Contractor by deducting testing charges from the Contract Price.

### 3.05 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

### 3.06 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

**END OF SECTION 01 40 00**

**SECTION 01 42 19****REFERENCE STANDARDS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Requirements relating to referenced standards.

**1.02 DEFINITIONS**

- A. Basic contract definitions are included in the Conditions of the Contract.
- B. Approved: When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. Directed: A command or instruction by the Architect. Other terms including requested, authorized, selected, approved, required, and permitted have the same meaning as directed.
- D. Indicated: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including shown, noted, scheduled, and specified have the same meaning as indicated.
- E. Regulations: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. Furnish: Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. Install: Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. Provide: Furnish and install, complete and ready for the intended use.
- I. Project Site: Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land the Project is being built on.

**1.03 QUALITY ASSURANCE**

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes. Such standards are made part of the Contract Documents by reference.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards when required by the Contract Documents or required to perform a construction activity.

- D. Each entity engaged in construction on the Project should be familiar with industry standards applicable to its construction activity.
- E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by the Contract Documents by mention or inference otherwise in any reference document.
- G. Where abbreviations and acronyms are used in Specifications or other Contract documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION 01 42 19**

**SECTION 01 60 00**  
**PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations and procedures.
- F. Spare parts and maintenance materials.
- G. "Substitution Request Form" at end of Section.

**1.02 RELATED SECTIONS**

- A. Document 00 21 13 - Instructions to Bidders: Product options and substitution procedures prior to bid date.
- B. Section 01 11 00 - Summary:
- C. Section 01 40 00 - Quality Requirements: Product quality monitoring.

**1.03 REFERENCES**

- A. NFPA 70 - National Electrical Code; National Fire Protection Association; 2005.

**1.04 SUBMITTALS**

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
  - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- D. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

**PART 2 PRODUCTS****2.01 EXISTING PRODUCTS**

- A. The re-use of certain materials and equipment already existing on the project site is prohibited.
  - 1. Do not use other materials or equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

**2.02 NEW PRODUCTS**

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Provide interchangeable components of the same manufacture for components being replaced.
- C. Motors: Specific motor type is specified in individual specification sections.
- D. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- E. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

**2.03 PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

**2.04 SPARE PARTS AND MAINTENANCE PRODUCTS**

- A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

**PART 3 EXECUTION****3.01 MATERIALS AND EQUIPMENT**

- A. Compatibility: Be responsible for coordinating and interrelating all sub-contracts, purchase orders, etc. Ensure compatibility of materials and procedures and validity of all guarantee and warranties required by specifications.
- B. Compliance with Manufacturer's Specifications and Recommendations.
  - 1. All materials, equipment, devices, services, procedures, etc., named or described in specifications and/or indicated on drawings, and all others furnished as equal thereto shall be furnished, used (installed, employed, etc.) and protected in strict compliance with specifications, recommendations and instructions of manufacturer and/or supplier.
  - 2. This requirement does not relieve the Contractor's responsibility for providing material and/or services beyond those required by manufacturer's specifications, etc., where such additional materials and/or services are otherwise required by Contract Documents.
  - 3. Should any material, item of equipment, device or procedure furnished as equal to that specified require accessories, supplemental materials, installation procedures, etc., different from and/or in addition to those required by that which is specified, the Contractor shall provide all such items at no increase in contract sum.
- C. Quality:
  - 1. All materials and equipment provided shall be new and of quality equal to or higher than that required by Contract Documents.
  - 2. In every case, requirements established by Contract Documents shall be considered a minimum, which will be accepted. Where strength of material(s) is a factor, all items furnished must have at least strength, carrying capacity and durability of item specified.
  - 3. All workmanship must be first class in every respect and representative of best obtainable for each trade.
- D. Acceptance by Architect: All materials and equipment are subject to approval by Architect:
  - 1. Shop drawings and/or samples.
  - 2. Actual items as installed on site.
  - 3. Materials or equipment furnished and/or installed will not be accepted if such are found to be at variance with requirements of Contract Documents.
- E. Where terms "or equal," "or approved equal," "as approved," etc., appear in specifications or on drawings:
  - 1. Provide equivalent materials, products or procedures as named in the specifications.
  - 2. Materials other than those specifically named may be used, provided the equivalent substitution is accomplished by means allowed in Contract Documents.

**3.02 SUBSTITUTION PROCEDURES**

- A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
- B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

- D. A request for substitution constitutes a representation that the submitter:
  - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
  - 2. Will provide the same warranty for the substitution as for the specified product.
  - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
  - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
  - 5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
  - 1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
  - 2. Submit Substitution Request Form contained herein at the end of this section, provide supporting information requested to support your request for product substitution.
  - 3. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
  - 4. The Architect will notify Contractor in writing of decision to accept or reject request.

### 3.03 SUBSTITUTIONS BEFORE AWARD OF CONTRACT (***DURING BIDDING***)

- A. Bidder and suppliers may submit a request for substitution to the Architect/Engineer for approval prior to four (4) days before bid submission. Provide adequate information with the request to verify that proposed substitution meets the requirements of the specification. Approval or rejection of each proposed substitution or other change shall be at the discretion of Architect/Engineer. If proposed change is approved, Architect will issue written statement in the form of an Addendum certifying same.
  - 1. Use "Substitution Request Form" provided at the end of this section.
  - 2. If proposed product is accepted, an addendum will be issued to Bidders a minimum two (2) days before receipt of bids and will become part of the Contract Documents.
- B. Request for Change at time of Bid Submission by Voluntary Alternate:
  - 1. Bidder may submit Voluntary Alternates for materials, products or procedures for which he also submits bona fide base bid proposals. Voluntary Alternates shall be submitted in list form, naming each proposed substitute and difference, if any, which will be made in contract price for each substitution, should it be accepted. Owner may accept or reject each individual voluntary alternate.

### 3.04 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

### 3.05 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION 01 60 00**

**~ Substitution Request Form follows ~**

**Substitution Request Form***(for use during the Bidding Period)***Substitution Requested by:**

Contact Name: \_\_\_\_\_ Date: \_\_\_\_\_

Firm Name: \_\_\_\_\_

Firm Address: \_\_\_\_\_

Phone #: \_\_\_\_\_ Fax #: \_\_\_\_\_

**Product Information:**

Specification Section Title: \_\_\_\_\_ Description: \_\_\_\_\_

Specification Section No.: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

Proposed Substitution: \_\_\_\_\_

Product Trade Name: \_\_\_\_\_

Manufacturer: \_\_\_\_\_ Model No.: \_\_\_\_\_

Phone: \_\_\_\_\_ ~ or ~ Website: \_\_\_\_\_

**Attach appropriate Product Data to support the substitution requested:**

- Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.
- Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation. (Check all that applies, below)

**The Undersigned certifies: (check all appropriate boxes)**

- ☐ Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- ☐ Same warranty will be furnished for proposed substitution as for specified product.
- ☐ Same maintenance service and source of replacement parts, as applicable, is available.
- ☐ Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- ☐ Proposed substitution does not affect dimensions and functional clearances.
- ☐ Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by (please print): \_\_\_\_\_

Signed: \_\_\_\_\_

**A/E's REVIEW AND ACTION**

- ☐ **Substitution approved** –
  - Make submittals in accordance with Section 016000 - Substitution Procedures.
- ☐ **Substitution approved as noted** \_\_\_\_\_
  - Make submittals in accordance with Section 016000 - Substitution Procedures.
- ☐ **Substitution rejected – Use specified materials.**
- ☐ **Substitution Request received too late** – Use specified materials.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Supporting Data Attached:

Drawings \_\_\_\_\_ Product Data \_\_\_\_\_ Samples \_\_\_\_\_ Tests \_\_\_\_\_ Reports \_\_\_\_\_ Other \_\_\_\_\_

**END OF SUBSTITUTION REQUEST FORM**

**SECTION 01 70 00****EXECUTION REQUIREMENTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, except payment procedures.

**1.02 RELATED SECTIONS**

- A. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures.
- C. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
- D. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.
- E. Individual Product Specification Sections:
  - 1. Advance notification to other sections of openings required in work of those sections.
  - 2. Limitations on cutting structural members.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
  - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
  - 2. Identify demolition firm and submit qualifications.
  - 3. Include a summary of safety procedures.
- D. Cutting and Patching: Submit written request in advance of cutting or alteration which affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather exposed or moisture resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.

4. Visual qualities of sight exposed elements.
5. Work of Owner or separate Contractor.
6. Include in request:
  - a. Identification of Project.
  - b. Location and description of affected work.
  - c. Necessity for cutting or alteration.
  - d. Description of proposed work and products to be used.
  - e. Effect on work of Owner or separate Contractor.
  - f. Written permission of affected separate Contractor.
  - g. Date and time work will be executed.

E. Project Record Documents: Accurately record actual locations of capped and active utilities.

#### 1.04 QUALIFICATIONS

- A. For demolition work, employ a firm specializing in the type of work required.
1. Minimum of five years of documented experience.

#### 1.05 PROJECT CONDITIONS

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases..
- B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
- C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- D. Pest Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- E. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- F. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

#### 1.06 COORDINATION

- A. See Section 01100 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

- E. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

## **PART 2 PRODUCTS**

### **2.01 PATCHING MATERIALS**

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 – Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting/patching means acceptance of existing conditions.

### **3.02 PREPARATION**

- A. Clean substrate surfaces prior to applying next material or substance.

- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

### 3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a pre-installation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  - 1. Review conditions of examination, preparation and installation procedures.
  - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### 3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- G. Utilize recognized engineering survey practices.
- H. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
  - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
  - 2. Grid or axis for structures.
  - 3. Building foundation, column locations, ground floor elevations.
- J. Periodically verify layouts by same means.

- K. Maintain a complete and accurate log of control and survey work as it progresses.

### 3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

### 3.06 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
  - 1. Verify that construction and utility arrangements are as shown.
  - 2. Report discrepancies to Architect before disturbing existing installation.
  - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
  - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
  - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- C. Remove existing work as indicated and as required to accomplish new work.
  - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
  - 2. Remove items indicated on drawings.
  - 3. Relocate items indicated on drawings.
  - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
  - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- D. Services (Including but not limited to HVAC, Plumbing, Electrical, and telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
  - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
  - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
  - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
    - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.

- b. Provide temporary connections as required to maintain existing systems in service.
- 4. Verify that abandoned services serve only abandoned facilities.
- 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- E. Protect existing work to remain.
  - 1. Prevent movement of structure; provide shoring and bracing if necessary.
  - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
  - 3. Repair adjacent construction and finishes damaged during removal work.
  - 4. Patch as specified for patching new work.
- F. Adapt existing work to fit new work:
  - 1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
  - 2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
  - 3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
  - 4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.
- G. Refinish existing surfaces as indicated:
  - 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
  - 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
  - 3. Patch as specified for patching new work.
- H. Clean existing systems and equipment.
- I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- J. Do not begin new construction in alterations areas before demolition is complete.
- K. Comply with all other applicable requirements of this section.

### 3.07 CUTTING AND PATCHING

- A. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
- B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- C. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- E. Restore work with new products in accordance with requirements of Contract Documents.

- F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07840, to full thickness of the penetrated element.
- H. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- I. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- J. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

### 3.08 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

### 3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Prohibit traffic from landscaped areas.

- H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

### 3.10 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

### 3.11 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

### 3.12 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Section 15950 and 01400.

### 3.13 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
  - 1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.

- B. Use cleaning materials that are nonhazardous.
- C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Replace filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

### 3.14 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
  - 1. Provide copies to Owner.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Substantial Completion.
- D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
- E. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
- F. Accompany Project Coordinator on preliminary final inspection.
- G. Notify Architect when work is considered finally complete.
- H. Complete items of work determined by Architect's final inspection.

### 3.15 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in specification sections for one year from date of Substantial Completion.
- B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

- D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

**END OF SECTION 01 70 0**

**SECTION 01 74 19**  
**CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section includes: Requirements and procedures for ensuring optimal diversion of construction waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.

**1.2 DEFINITIONS**

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations.
- B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in Federal Standards. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel.
- C. C&D Recycling Center. A facility that receives only C&D material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- D. Disposal. Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.
- E. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- F. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- G. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- I. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- J. Solid Waste: All putrescible and non-putrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid

wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.

- K. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- L. Waste Hauler: A company that possesses a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

### 1.3 SUBMITTALS

- A. Contractor's Construction Waste and Recycling Plan
  - 1. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
  - 2. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan.
  - 3. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures.

## **PART 2 PRODUCTS – Not Used**

## **PART 3 EXECUTION**

### 3.1 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

- A. Identify re-use, salvage, and recycling facilities.
- B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.
  - 1. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
  - 2. Source separate new construction, excavation and demolition materials including, but not limited to the following types:
    - a. Asphalt.
    - b. Concrete, concrete block, slump stone (decorative concrete block), and rocks.
    - c. Drywall.
    - d. Green materials (i.e. tree trimmings and land clearing debris).
    - e. Metal (ferrous and non-ferrous).
    - f. Miscellaneous Construction Debris.
    - g. Paper or cardboard.
    - h. Red Clay Brick.
    - i. Reuse or Salvage Materials
    - j. Soils.

- k. Wire and Cable.
  - l. Wood.
- 3. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility.

### 3.2 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- B. Use a permitted waste hauler or Contractor's trucking services and personnel.
- C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities prior to delivering materials.
- D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

### 3.3 RE-USE AND DONATION OPTIONS

- A. Implement a re-use program to the greatest extent feasible. Options may include:
  - 1. Habitat for Humanity
  - 2. Local resources for the recycling and reuse of building materials.

### 3.4 REVENUE

- A. Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents.

**END OF SECTION 01 74 19**

**SECTION 01 78 00**  
**CLOSEOUT SUBMITTALS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

**1.02 RELATED SECTIONS**

- A. Section 00 73 00 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 70 00 - Execution Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

**1.03 SUBMITTALS**

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
  - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
  - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
  - 3. Submit 1 copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
  - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
  - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
  - 2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
  - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

**PART 2 PRODUCTS - NOT USED****PART 3 EXECUTION****3.01 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other modifications to the Contract.
  - 5. Reviewed shop drawings, product data, and samples.
  - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
  - 1. Manufacturer's name and product model and number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  - 2. Field changes of dimension and detail.
  - 3. Details not on original Contract drawings.

**3.02 OPERATION AND MAINTENANCE DATA**

- A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

**3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES**

- A. For Each Product, Applied Material, and Finish:
  - 1. Product data, with catalog number, size, composition, and color and texture designations.
  - 2. Information for re-ordering custom manufactured products.

- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

### 3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
  - 1. Description of unit or system, and component parts.
  - 2. Identify function, normal operating characteristics, and limiting conditions.
  - 3. Include performance curves, with engineering data and tests.
  - 4. Complete nomenclature and model number of replaceable parts.
- B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- C. Include color coded wiring diagrams as installed.
- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.
- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Provide control diagrams by controls manufacturer as installed.
- K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Include test and balancing reports.
- O. Additional Requirements: As specified in individual product specification sections.

### 3.05 OPERATION AND MAINTENANCE MANUALS

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- B. Prepare data in the form of an instructional manual.
- C. Binders: Commercial quality, 8-1/2 x 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
  - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
  - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
    - e. Maintenance instructions for equipment and systems.
    - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
  - 3. Part 3: Project documents and certificates, including the following:
    - a. Shop drawings and product data.
    - b. Air and water balance reports.
    - c. Certificates.
- J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

**3.06 WARRANTIES AND BONDS**

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 x 11 inch three D side ring binders with durable plastic covers.
- F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

**END OF SECTION 01 78 00**

**SECTION 03 54 16****HYDRAULIC CEMENT UNDERLAYMENT****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings, general provisions of the Contract, and other related construction documents such as Division 01 specifications apply to this Section

**1.2 SUMMARY**

- A. This Section includes an underlayment that consists of a blend of Portland cement and other hydraulic cements that is used to level and smooth interior concrete, terrazzo, ceramic and quarry tile, epoxy coating systems and non-water-soluble adhesive residue on concrete.

1. [ARDEX K 40™ RAPID Rapid, High Flow Self-Leveling Underlayment](#)
2. [Selected ARDEX Primer](#)
3. ARDEX ARDIFIX™ Low Viscosity Rigid Polyurethane Crack & Joint Repair
4. ARDEX FEATHER FINISH® Self-Drying Cement Based Finish Underlayment
5. ARDEX ARDISEAL™ Rapid Plus Semi-Rigid Joint Sealant B.      Related

Sections include the following:

1. Section 03 30 00, Cast-In-Place Concrete
2. Division 09 Flooring Sections

**1.3 REFERENCES**

- A. ASTM C109M, Compressive Strength Air-Cure Only
- B. ASTM E10M, Standard Test Method for Brinell Hardness
- C. ASTM F2170, Relative Humidity in Concrete Floor Slabs Using in situ Probes
- D. ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

**1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Safety Data Sheets.
- B. Qualification Data: For Installer

## 1.5 QUALITY ASSURANCE

- A. Installation of the ARDEX product must be completed by a factory-trained applicator, such as an ARDEX LevelMaster® Elite, Choice Contractor or INSTALL Substrate Prep Certified Installer, using mixing equipment and tools approved by the manufacturer. Contact ARDEX Americas (724) 203-5000 for a list of recommended installers.
- B. Product must have hydraulic cement-based inorganic binder content as the primary binder which includes Portland cement per ASTM C150: Standard Specification for Portland cement and other specialty hydraulic cements. Gypsum-based products are not acceptable.
- C. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of products for not less than 10 years. Contact Manufacturer Representative prior to installation.

- 1.6 WARRANTY: ARDEX K 40™ RAPID installed as part of a floor system, shall be installed in conjunction with the recommended ARDEX Tile & Stone Installation Materials or WW HENRY Flooring Adhesive, as appropriate, to provide the ARDEX SystemOne comprehensive warranty, depending on the system installed.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.
- B. Store products in a dry area with temperature maintained between 50° and 85°F (10° and 29°C) and protect from direct sunlight.
- C. Handle products in accordance with manufacturer's printed recommendations.

## 1.8 PROJECT CONDITIONS

- A. Do not install material below 50°F (10°C) surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section. Install quickly if substrate is warm and follow warm weather instructions available from the ARDEX Technical Service Department.

## PART 2 – PRODUCTS

### 2.1 HYDRAULIC CEMENT UNDERLAYMENT

- A. Hydraulic Cement-based Self-Leveling Underlayment

Acceptable Products:

- 1. ARDEX K 40™ RAPID; manufactured by ARDEX Americas, USA, (724) 203-5000, [www.ardexamericas.com](http://www.ardexamericas.com)
  - a. Selected ARDEX Primer dependent on substrate, and absorbency of substrate and moisture control requirements. See ARDEX K 40 RAPID Technical Data sheet for further information.

2. Performance and Physical Properties: Meet or exceed the following values for material cured at 73° F+/-3°F (23° C+/-3°C) and 50% +/-5% relative humidity:

- a. Mixing: Barrel Mix or Pump
- b. Flow Time: 10 minutes
- c. Walkable: 60 – 90 minutes
- d. Compressive Strength: 8,000 psi (562 kg/cm<sup>2</sup>) at 28 days, ASTM C109M
- e. Flexural Strength: 2,000 psi (140.6 kg/cm<sup>2</sup>) at 28 days, ASTM C348
- h. VOC: 0

## 2.2 CRACK AND JOINT REPAIR

- A. Low Viscosity Rigid Polyurethane Crack and Joint Repair; ARDEX ARDIFIX™; Manufactured by ARDEX Americas; USA; 724-203-5000, [www.ardexamericas.com](http://www.ardexamericas.com)
- B. Semi-Rigid Joint Sealant; ARDEX ARDISEAL™ Rapid Plus Semi-Rigid Joint Sealant; Manufactured by ARDEX Americas; USA; 724-203-5000, [www.ardexamericas.com](http://www.ardexamericas.com)

## 2.3 PATCH

- A. ARDEX FEATHER FINISH® Self-Drying Cement Based Finished Underlayment

# PART 3 – EXECUTION

## 3.1 PREPARATION

- A. General: Prepare substrate in accordance with manufacturer's instructions.
  - 1. Shot blasting or other mechanical means must be used for Prop Pre. Sanding is not a sufficient means of cleaning or preparing concrete. Do not use acid etching, adhesive removers, solvents or sweeping compounds, as these are bond breakers.
  - 2. Handle and dispose of asbestos and other hazardous materials in accordance with prevailing regulations, which supersede the recommendations in this document.
  - 3. All substrates must be sound, solid and thoroughly clean of all bond-breaking contaminants, including but not limited to overwatered or otherwise loose or weak material, unapproved sealers, unsuitable adhesive residues, and patching and leveling materials.
  - 4. Depending on the selected moisture control system or primer, additional prep may be needed. Please see the technical data sheet.
- B. Crack and Joint Preparation:
  - 1. Moving Joints and Moving Cracks – Honor all moving joints and moving cracks up through the underlayment. A flexible sealing compound such as ARDEX ARDISEAL™ Rapid Plus Semi-Rigid Joint Sealant may be installed.
  - 2. Saw Cuts, Dormant Control Joints and Dormant Cracks – Fill all dormant control joints and dormant cracks with ARDEX ARDIFIX™ Low Viscosity Rigid Polyurethane Crack & Joint Repair or ARDEX FEATHER FINISH® Self-Drying, Cement-Based Finish Underlayment as recommended by the manufacturer.

3. If a moisture control system will be installed, the crack and joint preparation recommendations will differ. Please see the technical data sheet.

### 3.2 APPLICATION OF ARDEX K 40™ RAPID

- A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.
- B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.
- C. Priming: Comply with manufacturer's printed instructions.
- D. Mixing: Comply with manufacturer's printed instructions. Pumping: Product can be pumped. Please contact the ARDEX Technical Service Department.
- E. Application: Comply with manufacturer's printed instructions.
- F. Curing: The cure time is dependent on the installed thickness and the selected finish flooring. See the Technical Data sheet for further information.

### 3.3 FIELD QUALITY CONTROL

- A. Where specified, field sampling of the ARDEX underlayment is to be done by taking an entire unopened bag of the product being installed to an independent testing facility to perform compressive strength testing in accordance with ASTM C 109/modified: air-cure only. There are no in situ test procedures for the evaluation of compressive strength.

### 3.4 PROTECTION

- A. Prior to the installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

**END OF SECTION**

**SECTION 04 05 00**  
**MORTAR AND MASONRY GROUT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Mortar for masonry.
- B. Grout for masonry.

**1.02 RELATED SECTIONS**

- A. Section 04 22 00 - Concrete Unit Masonry: Installation of mortar and grout.

**1.03 REFERENCES**

- A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements For Masonry Structures; American Concrete Institute International; 2005.
- B. ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures; American Concrete Institute International; 2005.
- C. ASTM C 91 - Standard Specification for Masonry Cement; 2003a.
- D. ASTM C 94/C 94M - Standard Specification for Ready-Mixed Concrete; 2004a.
- E. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar; 2004.
- F. ASTM C 150 - Standard Specification for Portland Cement; 2004a.
- G. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2004.
- H. ASTM C 270 - Standard Specification for Mortar for Unit Masonry; 2004a.
- I. ASTM C 387 - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete; 2004.
- J. ASTM C 404 - Standard Specification for Aggregates for Masonry Grout; 2004.
- K. ASTM C 476 - Standard Specification for Grout for Masonry; 2002.
- L. ASTM C 595 - Standard Specification for Blended Hydraulic Cements; 2003.
- M. ASTM C 780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2002.
- N. ASTM C 1019 - Standard Test Method for Sampling and Testing Grout; 2003.
- O. ASTM C 1142 - Standard Specification for Extended Life Mortar for Unit Masonry; 1995 (Reapproved 2001).
- P. IMIABC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.
- Q. IMIABC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C 270 is to be used. Also include required environmental conditions and admixture limitations. Mix design submittal for information: For each type of mortar. Include description of type and proportions of ingredients.
  - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
  - 2. Include test reports, according to AASTM C1019, for grout mixes required to comply with compressive strength requirement.
- C. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- D. Reports: Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C 270 and test and evaluation reports per ASTM C 780.
- E. Reports: Submit reports on grout indicating conformance of component grout materials to requirements of ASTM C 476 and test and evaluation reports to requirements of ASTM C 1019.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Instructions: Submit packaged dry mortar manufacturer's installation instructions.

#### 1.05 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

#### 1.07 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Requirements: Comply with recommendations of IMIABC (CW).
- B. Hot Weather Requirements: Comply with IMIABC (HW).

### **PART 2 PRODUCTS**

#### 2.01 MATERIALS

- A. Masonry Cement: ASTM C 91, Type N.
  - 1. Colored mortar: Premixed cement as required to match Existing mortar.
- B. Portland Cement: ASTM C 150, Type I - Normal; color as required to produce approved color sample.
  - 1. Used for grouting requirements.
- C. Blended Cement: ASTM C 595, Type S; color as required to produce approved color sample.
- D. Packaged Dry Mortar: ASTM C 387, Type N, using existing color cement.
- E. Hydrated Lime: ASTM C 207, Type S.
- F. Mortar Aggregate: ASTM C 144.
- G. Grout Aggregate: ASTM C 404.
- H. Pigments for Colored Mortar: Iron or chromium oxides with demonstrated stability and colorfastness.
  - 1. Colors: As required to match Architect's color samples.

- I. Water: Clean and potable.
- J. Accelerating Admixture: Nonchloride type for use in cold weather.
- K. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.
- L. Bonding Agent: Latex type.

## 2.02 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use portland cement-lime, mortar cement mortar, or masonry cement mortar unless otherwise indicated.
  - 3. For exterior masonry, use portland cement-lime or mortar cement mortar.
  - 4. For veneer masonry use masonry cement.
  - 5. For reinforced masonry, use portland cement-lime or mortar cement mortar.
  - 6. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- A. Ready Mixed Mortar: ASTM C 1142, Type RM.
- B. Mortar for Unit Masonry: ASTM C 270, Proportion Specification.
  - 1. Engineered masonry: Type M.
  - 2. Masonry below grade and in contact with earth: Type S.
  - 3. Exterior, loadbearing masonry: Type N.
  - 4. Exterior, non-loadbearing masonry: Type N.
  - 5. Interior, loadbearing masonry: Type N.
  - 6. Interior, non-loadbearing masonry: Type O.
  - 7. Pointing mortar: Type N with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
- C. Stain Resistant Pointing Mortar: One part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 percent of Portland cement by weight.
- D. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

## 2.03 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C 270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
- D. Do not use anti-freeze compounds to lower the freezing point of mortar.
- E. If water is lost by evaporation, re-temper only within two hours of mixing.
- F. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

## 2.04 GROUT MIXES

- A. Bond Beams and Lintels: 4,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
  - 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
  - 2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
- B. Engineered Masonry: 4,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
  - 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
  - 2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

## 2.05 GROUT MIXING

- A. Mix grout in accordance with ASTM C 94/C 94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C 476 for fine and coarse grout.
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- D. Do not use anti-freeze compounds to lower the freezing point of grout.

## 2.06 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01400.
- B. Mortar Mixes: Test mortars pre-batched by weight in accordance with ASTM C 780 recommendations for preconstruction testing.
  - 1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.
- C. Grout Mixes: Test grout batches in accordance with ASTM C 1019 procedures.
  - 1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

# PART 3 EXECUTION

## 3.01 PREPARATION

- A. Apply bonding agent to existing concrete surfaces.
- B. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

## 3.02 INSTALLATION

- A. Install mortar and grout to requirements of section(s) in which masonry is specified.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

## 3.03 GROUTING

- A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of contract documents.
- B. Perform grouting by means of high-lift technique, except in locations that mandate use of low-lift grouting technique.
  - 1. Do not use high-lift grouting where size of cavities mandates use of fine grout.
- C. Low-Lift Grouting:
  - 1. Limit height of pours to 12 inches.
  - 2. Limit height of masonry to 16 inches above each pour.
  - 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
  - 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- D. High-Lift Grouting:
  - 1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
  - 2. Brick: Limit pours to maximum 12 feet in height and 25 feet horizontally.
  - 3. Hollow Masonry: Limit lifts to maximum 4 feet and pours to maximum height of 24 feet.
  - 4. Place grout for spanning elements in single, continuous pour.

#### 3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field tests, in accordance with provisions of Section 01 40 00 – Quality Requirements.
- B. Test and evaluate mortar in accordance with ASTM C 780 procedures.
  - 1. Test with same frequency as specified for masonry units.
- C. Test and evaluate grout in accordance with ASTM C 1019 procedures.
  - 1. Test with same frequency as specified for masonry units.

**END OF SECTION 04 05 00**

**SECTION 04 22 00**  
**CONCRETE UNIT MASONRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete masonry units.
- B. Reinforcement, anchorage, and accessories.
- C. Flashings.

**1.02 RELATED SECTIONS**

- A. Section 04 05 19 - Mortar and Masonry Grout: Mortar and grout for single wythe unit masonry.
- B. Section 07 84 00 - Firestopping: Firestopping at penetrations of masonry work.
- C. Section 07 90 00 - Joint Sealers: Rod and sealant at control joints.

**1.03 REFERENCES**

- A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures; American Concrete Institute International; 2005.
- B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2005.
- C. ASTM A 82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2002.
- D. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2004.
- E. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2004b.
- F. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2004a.
- G. ASTM C 90 - Standard Specification for Loadbearing Concrete Masonry Units; 2003.
- H. ASTM C 129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2003.
- I. ASTM C 140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2003.
- J. IMIABC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.
- K. IMIABC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide data for concrete masonry units and fabricated wire reinforcement.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Submittals for Environmental Performance:
  - 1. Provide data indicating the percentage of post-industrial pozzolan (i.e. fly ash) cement substitution as a percentage of the full product composite by weight.
  - 2. Provide product data stating the location where all unit masonry products were manufactured and where the raw materials were harvested, extracted or recovered.
- E. Shop drawings for reinforcing steel. Detailing bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315

#### 1.05 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

#### 1.07 ENVIRONMENTAL REQUIREMENTS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

### **PART 2 PRODUCTS**

#### 2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
  - 1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
  - 2. Special Shapes: Provide non-standard blocks configured for corners, headers, control joint edges, and other detailed conditions.
  - 3. Provide bull-nosed block at the following locations where exposed and indicated on drawings:
    - a. Outside corners.
    - b. Door/Window jambs.
    - c. Wing walls.
  - 4. Load-Bearing Units: ASTM C 90, medium and light weight.
    - a. Hollow block.
    - b. Exposed faces: Manufacturer's standard color and texture.
  - 5. Non-Loadbearing Units: ASTM C 129.

- C. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- D. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- E. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

## 2.02 MORTAR AND GROUT MATERIALS

- A. Mortar and Grout: As specified in Section 04 05 00.

## 2.03 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers of Joint Reinforcement and Anchors:
  - 1. Dur-O-Wal: [www.dur-o-wal.com](http://www.dur-o-wal.com).
  - 2. Hohmann & Barnard, Inc: [www.h-b.com](http://www.h-b.com).
  - 3. Masonry Reinforcing Corporation of America: [www.wirebond.com](http://www.wirebond.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420) deformed billet bars; galvanized.
- C. Single Wythe Joint Reinforcement: Truss type; ASTM A 82 steel wire, hot dip galvanized after fabrication to ASTM A 153/A 153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
- D. Strap Anchors: Bent steel shapes configured as required for specific situations, 1-1/4 in width, 0.105 in thick, lengths as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face, corrugated for embedment in masonry joint, hot dip galvanized to ASTM A 153/A 153M, Class B.
- E. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.
  - 1. Steel frame: Crimped wire anchors for welding to frame, 0.25 inch thick, with trapezoidal wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.

## 2.04 FLASHINGS

- A. Rubberized Asphalt Flashing: Self-adhering composite material comprising rubberized asphalt adhesive compound bonded to cross-laminated polyethylene film, minimum 0.030 inch total thickness.
- B. Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 coating.
- C. Lap Sealant: Butyl type as specified in Section 07 90 00.

## 2.05 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.

- B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; 4 inch wide x by maximum lengths available.
- C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

### **3.02 PREPARATION**

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

### **3.03 COURSING**

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
  - 1. Bond: Running.
  - 2. Coursing: One unit and one mortar joint to equal 8 inches.
  - 3. Mortar Joints: Concave.

### **3.04 PLACING AND BONDING**

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar as work progresses.
- E. Interlock intersections and external corners.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

### 3.05 REINFORCEMENT AND ANCHORAGE

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Reinforce joint corners and intersections with strap anchors 16 inches on center.
- F. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Space anchors at maximum of 24 inches horizontally and 16 inches vertically.
- G. Install anchors to structural framing at not more than 16 inches on center.

### 3.06 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
  - 1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
  - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
  - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Extend metal flashings through exterior face of masonry and turn down to form drip.
- C. Extend laminated flashings to within 1/4 inch of exterior face of masonry.
- D. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

### 3.07 LINTELS

- A. Install loose steel lintels over openings.
- B. Maintain minimum 8 inch bearing on each side of opening.

### 3.08 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control and expansion joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Size control joint in accordance with Section 07 90 00 for sealant performance.
- D. Form expansion joint as detailed.

### 3.09 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

### 3.10 TOLERANCES

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- E. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- F. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

### 3.11 CUTTING AND FITTING

- A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

### 3.12 FIELD QUALITY CONTROL

- A. An independent testing agency, as specified in Section 01 40 00 – Quality Requirements, will conduct field tests.
- B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C 140 for conformance to requirements of this specification.

### 3.13 CLEANING

- A. Remove excess mortar and mortar smears as work progresses.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

### 3.14 PROTECTION OF FINISHED WORK

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

**END OF SECTION 04 22 00**

**SECTION 05 50 00****METAL FABRICATIONS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Lintels.

**1.02 RELATED SECTIONS**

- A. Section 04 22 00 - Concrete Unit Masonry: Placement of metal fabrications in masonry.

**1.03 REFERENCES**

- A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2002.
- B. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2005.
- C. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2004a.
- D. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.
- E. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2004.
- F. ASTM A 283/A 283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2003.
- G. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2004b.
- H. ASTM A 325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2004b.
- I. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2003a.
- J. ASTM A 992/A992M - Standard Specification for Structural Steel Shapes; 2004.
- K. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.
- L. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2004 and errata.
- M. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- N. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- O. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide installation requirements, material lists, and maintenance requirements for Prefab Joist Installation Kit.

- C. Product Data: Provide manufacturer's installation materials, finishes, and maintenance requirements for corner guards.
- D. Architectural and Engineering services include the review of completed and accurate shop drawings. The Architect and/or Engineers will not review any shop drawings which do not meet industry standards for completion and accuracy; and which require excessive changes, corrections, revisions, or completion by the reviewing Architect and/or Engineer. The Architect will notify the Contractor upon the receipt of such sub-standard shop drawings. The Contractor shall then revise and re-submit the shop drawings, or shall opt to pay the Architect/Engineer an hourly rate for additional time spent in review/correction of the original submittals. Payment shall be made before final return of the A/E-corrected sub-standard shop drawings.
- E. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- F. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS - STEEL**

- A. Steel Sections: ASTM A 992, Fy = 50 ksi: All W Shapes; ASTM A 36: All other shapes.
- B. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.
- C. Plates: ASTM A 283.
- D. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black and hot-dip galvanized finish, as indicated.
- E. Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.
- F. Welding Materials: AWS D1.1; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

### **2.02 FABRICATION**

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## 2.03 FABRICATED ITEMS

- A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing.
- B. Lintels: As detailed:
  - a. Exterior Lintels – hot dipped galvanized.
  - b. Interior Lintels – prime paint finish.

## 2.04 FINISHES - STEEL

- A. Prime paint all steel items.
  - 1. Exceptions: Galvanize items to be embedded in concrete or masonry.
  - 2. Exceptions: Do not prime surfaces in direct contact with concrete, and where field welding is required.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A 123/A 123M requirements.

## 2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

# PART 3 EXECUTION

## 3.01 EXAMINATION

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

## 3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

## 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.

- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- G. Prefab Joist Installation Kit: Install in compliance with manufacturer's written instructions.
  - 1. Align eyebolt with plane of ceiling.

### 3.04 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**END OF SECTION 05 50 00**

**SECTION 61 10 00**  
**ROUGH CARPENTRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Preservative treatment of wood.
- B. Fire retardant treatment of wood.
- C. Telephone and electrical panel boards.
- D. Wood nailers and curbs for roofing and items installed on roof.
- E. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, and wood trim.
- F. Miscellaneous wood nailers and furring strips.

**1.02 RELATED SECTIONS**

- A. Section 08 11 13 – Hollow Metal Doors & Frames

**1.03 REFERENCES**

- A. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2004.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- C. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
- D. AWPA C9 - Plywood -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2003.
- E. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
- F. AWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
- G. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood-Preservers' Association; 2005.
- H. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995.
- I. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.
- J. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.

## 1.04 QUALITY ASSURANCE

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
- B. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
- C. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

## 1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

## PART 2 PRODUCTS

### 2.01 GENERAL REQUIREMENTS

- A. Lumber fabricated from old growth timber is not permitted.
- B. Composite wood and agrifiber products shall meet standards for low-emitting materials containing no urea-formaldehyde.

### 2.02 DIMENSION LUMBER

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Miscellaneous Blocking, Furring, and Nailers:
  - 1. Lumber: S4S, No. 2 or Standard Grade.
  - 2. Boards: Standard or No. 3.

### 2.03 CONSTRUCTION PANELS

- A. Wall Sheathing: Plywood, PS 1, Grade FRT - Fire-Retardant-Treated plywood.
  - 1. Class A rated; ASTM E 84.
  - 2. Flame spread Rating: 25, maximum.
  - 3. Smoke development Rating: 80, maximum.
- B. Other Applications:
  - 1. Concealed Plywood: PS 1, C-C Plugged, exterior grade.
  - 2. Exposed Plywood: PS 1, A-D, interior grade.
  - 3. Electrical Component Mounting: APA rated sheathing, fire retardant treated.

### 2.04 ACCESSORIES

- A. Fasteners and Anchors:
  - 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
  - 2. Anchors: Toggle bolt type for anchorage to hollow masonry.
- B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.

## 2.05 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
- B. Fire Retardant Treatment:
  - 1. Manufacturers:
    - a. Arch Wood Protection, Inc: [www.wolmanizedwood.com](http://www.wolmanizedwood.com).
    - b. Hoover Treated Wood Products, Inc: [www.frtw.com](http://www.frtw.com).
    - c. Osmose, Inc: [www.osmose.com](http://www.osmose.com).
    - d. Substitutions: See Section 01600 - Product Requirements.
  - 2. Interior Type A: AWPA Use Category UCFA, Commodity Specification H (Treatment C20 for lumber and C27 for plywood), low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E 84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
    - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    - b. Treat rough carpentry items as indicated.
    - c. Do not use treated wood in applications exposed to weather or where the wood may become wet.
- C. Preservative Treatment:
  - 1. Manufacturers:
    - a. Arch Wood Protection, Inc: [www.wolmanizedwood.com](http://www.wolmanizedwood.com).
    - b. Chemical Specialties, Inc: [www.treatedwood.com](http://www.treatedwood.com).
    - c. Osmose, Inc: [www.osmose.com](http://www.osmose.com).
    - d. Substitutions: See Section 01600 - Product Requirements.
- D. Preservative Pressure Treatment of Lumber Above Grade: AWPA Use Category UC3B, Commodity Specification A (Treatment C2) using waterborne preservative to 0.25 lb/cu ft retention.
  - 1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
  - 2. Treat lumber in contact with flashing.
  - 3. Treat lumber in contact with masonry or concrete.
  - 4. Treat lumber less than 18 inches above grade.
    - a. Treat lumber in other locations as indicated.
  - 5. Preservative Pressure Treatment of Plywood Above Grade: AWPA Use Category UC2 and UC3B, Commodity Specification F (Treatment C9) using waterborne preservative to 0.25 lb/cu ft retention.
    - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
    - b. Treat plywood in contact with roofing, flashing, or waterproofing.
    - c. Treat plywood in contact with masonry or concrete.
    - d. Treat plywood less than 18 inches above grade.
    - e. Treat plywood in other locations as indicated.

**PART 3 EXECUTION****3.01 FRAMING INSTALLATION**

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength.
- B. Install structural members full length without splices.
- C. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes.
- D. Frame openings with two or more studs at each jamb; support headers on cripple studs.
- E. Provide miscellaneous members as indicated or as required to support finishes, fixtures, specialty items, and trim.

**3.02 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD**

- A. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

**3.03 SITE APPLIED WOOD TREATMENT**

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

**3.04 TOLERANCES**

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

**END OF SECTION 06 10 00**

**SECTION 06 41 19****COUNTERTOPS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Countertops for custom cabinets.
- B. Countertops for manufactured casework.

**1.02 RELATED SECTIONS**

- A. Section 12 32 16 – Plastic Laminate Clad Casework.

**1.03 REFERENCES**

- A. ANSI A208.1 - American National Standard for Particleboard; 1999.
- B. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2002.
- C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- D. AWI/AWMAC (QSI) - Quality Standard Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2003.
- E. ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2002)
- F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- G. PS 1 - Construction and Industrial Plywood; 1995.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 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. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
  - 1. Field verify existing conditions and dimensions, indicate on shop drawings.
  - 2. Identify countertop splice joint locations on shop drawings.
- D. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- F. Installation Instructions: Manufacturer's installation instructions and recommendations.

G. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

H. Letter of Certification for Pressure Treatment: Submit Certification from treating plant stating chemicals and process used and net amount of preservatives retained are in conformance with specified standards.

#### 1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
- B. All wood products designated as "FSC certified" in this specification shall be certified according to the rules of the Forest Stewardship Council ([www.fscus.org](http://www.fscus.org)).

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.07 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 absolute limits.

### PART 2 PRODUCTS

#### 2.01 COUNTERTOP ASSEMBLIES

##### A. General Requirements :

- 1. Lumber fabricated from old growth timber is not permitted.
- 2. Certification: Forest Stewardship Council (FSC) Certified.

##### B. Solid Surface Countertops and Window Sills: Solid surfacing sheet or plastic resin casting self-supporting over structural members.

- 1. Flat Sheet Thickness: 1/2 inch.
- 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISSFA-2 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
  - a. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E 84.
  - b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
  - c. Color and Pattern: As selected by architect from manufacturer's full range. Basis of design: Corian price group C.
  - d. Manufacturers:
    - 1) Dupont: [www.corian.com](http://www.corian.com).
    - 2) Formica Corporation: [www.formica.com](http://www.formica.com).
    - 3) LX Hausys: [www.lxhausys.com](http://www.lxhausys.com).
    - 4) Wilsonart International, Inc: [www.wilsonart.com](http://www.wilsonart.com).

- 5) Substitutions: See Section 01 60 00 - Product Requirements.
- 3. Countertop Exposed Edge Treatment: Built up to 1 1/4" thick.
- 4. Window Sill Exposed Edge Treatment: Built up to minimum 1 1/4" inch thick; radiused edge.

## 2.02 ACCESSORY MATERIALS

- A. Plywood for Supporting Substrate: PS 1 Exterior Type, AC veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
- B. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines.
- C. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.
- D. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined. Low VOC, low odor, solvent-free, water-based contact adhesives meeting the requirements set forth in the applicable LEED Reference Guide. See the applicable LEED Reference Guide for the most current VOC limits for adhesives, paints, and coatings.
- E. Joint Sealant: Mildew-resistant silicone sealant, clear.

## 2.03 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
  - 1. Join lengths of tops using best method recommended by manufacturer.
  - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
  - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
  - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
  - 2. Height: 4 inches, unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- D. Wall-Mounted Counters: Provide brackets and braces as indicated on drawings.

## PART 3 EXECUTION

### 3.01 EXAMINATION

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

- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

### 3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.03 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
- C. Adhere full height backsplash material to substrate, seal exposed edges.
- D. Seal joint between back and end splashes, window sills and vertical surfaces.

### 3.04 CLEANING AND PROTECTION

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

### 3.05 COORDINATION AND VERIFICATION

- A. The contractor shall verify and coordinate the use of all wood products specified as FSC certified.

**END OF SECTION 06 41 19**

**SECTION 07 21 00****INSULATION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Acoustic Batt Insulation

**1.02 RELATED SECTIONS**

- A. Section 06 10 00 – Rough Carpentry
- B. Section 07 84 00 - Firestopping.
- C. Section 09 21 16 - Gypsum Board Assemblies.

**1.03 REFERENCES**

- A. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2004a.
- B. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2001.
- C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- D. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2004.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics.
- C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

**1.05 ENVIRONMENTAL REQUIREMENTS**

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

**1.06 SEQUENCING**

- A. Sequence work to ensure fireproofing and firestop materials are in place before beginning work of this section.

**PART 2 PRODUCTS****2.01 BATT INSULATION MATERIALS**

- A. Batt Insulation: ASTM C 665; preformed glass fiber batt; friction fit, conforming to the following:
  - 1. Surface Burning Characteristics: Flame spread index of 25 or less; smoke developed index of 450 or less, when tested in accordance with ASTM E 84.
  - 2. Combustibility: Non-combustible when tested in accordance with ASTM E 136, except for facing, if any.

3. Provide insulation made without formaldehyde.
  4. Thickness: As indicated on the drawings.
- B. Sound Attenuation Blankets: ASTM C 665, Type I. Lightweight, unfaced fiber glass, conforming to the following:
1. Surface Burning Characteristics: Fire Hazard Classification (FHC) of 25/50 when tested in accordance with ASTM E-84.
  2. Combustibility: Non-combustible.
  3. Provide insulation made without formaldehyde.
  4. Thickness: As indicated on the drawings.
- C. Manufacturers:
1. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com)
  2. Johns Manville Corporation: [www.jm.com](http://www.jm.com)
  3. Owens Corning Corp: [www.owenscorning.com](http://www.owenscorning.com)
- D. Substitutions: See Division 1 for Substitution Requests.

## 2.02 ACCESSORIES

- A. Sheet Vapor Retarder: Clear polyethylene film, 4 mil thick.
- B. Tape: Polyester self-adhering type, mesh reinforced, 2 inch wide.
- C. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
- D. Wire Mesh: Galvanized steel, knitted wire mesh.
- E. Adhesive: Type recommended by insulation manufacturer for application.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

### 3.02 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Retain insulation batts in place with wire mesh secured to framing members.
- F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- G. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.

- H. Tape seal tears or cuts in vapor retarder.
- I. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.
- J. Coordinate work of this section with construction of air and moisture barrier specified in Section 07 25 00.

### 3.03 PROTECTION OF FINISHED WORK

- A. Do not permit installed insulation to be damaged prior to its concealment.

**END OF SECTION 07 21 00**

**SECTION 07 84 00****FIRESTOPPING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Firestopping materials.
- B. Firestopping of all penetrations and interruptions to fire rated assemblies, whether indicated on drawings or not, and other openings indicated.

**1.02 RELATED SECTIONS**

- A. Section 01 70 00 - Execution Requirements: Cutting and patching.
- B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.
- C. Division 23 Sections: Firestopping of Mechanical Work.
- D. Division 26 Sections: Firestopping of Electrical Work.

**1.03 REFERENCES**

- A. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2000a.
- B. ASTM E 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2002.
- C. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- D. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- E. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Certificate from authority having jurisdiction indicating approval of materials used.

**1.05 QUALITY ASSURANCE**

- A. Fire Testing: Provide firestopping assemblies of designs which provide the specified fire ratings when tested in accordance with methods indicated, ASTM E 814, and ASTM E 119.
  - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
  - 2. Current evaluation reports published by CABO, ICBO, or BOCA will be considered as constituting an acceptable test report.
  - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

- C. Installer Qualifications: Company specializing in performing the work of this section and:
  - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors, or meeting any two of the following requirements:
  - 2. With minimum 3 years documented experience installing work of this type.
  - 3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
  - 4. Licensed by authority having jurisdiction.
  - 5. Approved by firestopping manufacturer.

#### 1.06 ENVIRONMENTAL REQUIREMENTS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

### PART 2 PRODUCTS

#### 2.01 FIRESTOPPING ASSEMBLIES

- A. Firestopping: Manufactured device.
  - 1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E 814 that has F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and that meets all other specified requirements.

#### 2.02 MATERIALS

- A. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant; conforming to the following:
  - 1. Durability and Longevity: Permanent.
  - 2. Manufacturers:
    - a. A/D Fire Protection Systems Inc: [www.adfire.com](http://www.adfire.com).
    - b. 3M Fire Protection Products: [www.3m.com/firestop](http://www.3m.com/firestop).
    - c. Specified Technologies, Inc: [www.stifirestop.com](http://www.stifirestop.com).
- B. Foam Firestoppping: Single component foam compound; conforming to the following:
  - 1. Durability and Longevity: Permanent.
  - 2. Manufacturers:
    - a. 3M Fire Protection Products: [www.3m.com/firestop](http://www.3m.com/firestop).
    - b. Specified Technologies, Inc: [www.stifirestop.com](http://www.stifirestop.com).
- C. Fibered Compound Firestopping: Formulated compound mixed with incombustible non-asbestos fibers; conforming to the following:
  - 1. Durability and Longevity: Permanent.
  - 2. Manufacturers:
    - a. A/D Fire Protection Systems Inc: [www.adfire.com](http://www.adfire.com).
    - b. USG: [www.usg.com](http://www.usg.com).
- D. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening; conforming to the following:
  - 1. Durability and Longevity: Permanent.
  - 2. Manufacturers:
    - a. A/D Fire Protection Systems Inc: [www.adfire.com](http://www.adfire.com).
    - b. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
    - c. USG: [www.usg.com](http://www.usg.com).

- E. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, collar, and flanged stops, intended to be installed after penetrating item has been installed; conforming to the following:
  - 1. Durability and Longevity: Permanent.
  - 2. Manufacturers:
    - a. Grace Construction Products: [www.na.graceconstruction.com](http://www.na.graceconstruction.com).
    - b. 3M Fire Protection Products: [www.3m.com/firestop](http://www.3m.com/firestop).
    - c. Specified Technologies, Inc: [www.stifirestop.com](http://www.stifirestop.com).
- F. Intumescent Putty: Compound which expands on exposure to surface heat gain; conforming to the following:
  - 1. Durability and Longevity: Permanent.
  - 2. Manufacturers:
    - a. Grace Construction Products: [www.na.graceconstruction.com](http://www.na.graceconstruction.com).
    - b. 3M Fire Protection Products: [www.3m.com/firestop](http://www.3m.com/firestop).
    - c. Specified Technologies, Inc: [www.stifirestop.com](http://www.stifirestop.com).
- G. Reusable Firestopping: Removable intumescent compressible shapes, pillows, or blocks specifically tested in removable configuration; conforming to the following:  
Durability and Longevity: Permanent.
  - 1. Manufacturers:
    - a. Grace Construction Products: [www.na.graceconstruction.com](http://www.na.graceconstruction.com).
    - b. Nelson Firestop Products: [www.nelsonfirestop.com](http://www.nelsonfirestop.com).
    - c. Specified Technologies, Inc: [www.stifirestop.com](http://www.stifirestop.com).
- H. Substitutions: See Section 01 60 00 - Product Requirements.
- I. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify openings are ready to receive the work of this section.

#### **3.02 PREPARATION**

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which may affect bond.
- C. Install backing materials to arrest liquid material leakage.

#### **3.03 INSTALLATION**

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authority having jurisdiction.
- C. Install labelling required by code.

#### **3.04 CLEANING AND PROTECTION**

- A. Clean adjacent surfaces of firestopping materials.
- B. Protect adjacent surfaces from damage by material installation.

**END OF SECTION 07 84 00**

**SECTION 07 90 00****JOINT SEALERS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Sealants and joint backing.
- B. Precompressed foam sealers.
- C. Hollow gaskets.

**1.02 RELATED SECTIONS**

- A. Section 07 84 00 - Firestopping: Firestopping sealants.
- B. Section 08 80 00 - Glazing: Glazing sealants and accessories.
- C. Section 09 21 16 - Gypsum Board Assemblies: Acoustic sealant.

**1.03 REFERENCES**

- A. ASTM C 834 - Standard Specification for Latex Sealants; 2000.
- B. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications; 2002.
- C. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2002.
- D. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005.
- E. ASTM D 1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2000.
- F. ASTM C 1247 - Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids; 2004.
- G. ASTM C 1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2004.
- H. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; [www.baaqmd.gov](http://www.baaqmd.gov); current edition.
- I. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).
- J. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2004.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Samples: Submit two samples, 6 x 6 inch in size illustrating sealant colors for selection.
- D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum 3 years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum 3 years experience.

### 1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

### 1.07 COORDINATION

- A. Coordinate the work with all sections referencing this section.

### 1.08 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a 1 year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
  - 1. Period: Two years from date of Substantial Completion.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Compatibility: Comply with ASTM C 1193; Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application.
- B. Colors of exposed joint materials: As selected by Architect from manufacturer's full range.
- C. Comply with ASTM C 920 for each sealant specified, including classifications for type, grade, class, and uses related to exposure and joint substrates.
- D. Stain-Test-Response Characteristics: Comply with ASTM C 1248 for nonstaining sealants required for porous substrates.
- E. Suitability for Immersion in Liquids: Comply with ASTM C 1247 for sealants required for continuous liquid emersion, length of exposure as referenced in ASTM C 920, Class 1 or 2.
- F. Suitability for Contact with Food: Comply with 21 CFR 177.2600 for sealants that will come in repeated contact with food.
- G. Acoustical: Comply with ASTM C 834 to reduce airborne sound transmission through perimeter joints and openings as demonstrated by testing representative assemblies according to ASTM E 90.
- H. Preformed Joint Sealants: Manufacturer's standard system consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.
- I. Preformed Compressible Foam Sealers: Manufacturer's standard mildew-resistant, nonmigratory, nonstaining, preformed, precompressed, open-cell foam sealant;

manufactured from high-density urethane foam impregnated with a nondrying, water-repellent agent.

## 2.02 MANUFACTURERS

- A. Silicone Sealants:
  - 1. GE Silicones: [www.gesilicones.com](http://www.gesilicones.com).
  - 2. Dow Corning Corporation; [www.dowcorning.com](http://www.dowcorning.com).
  - 3. Sonneborn, Division of ChemRex Inc.; [www.chemrex.com](http://www.chemrex.com).
  - 4. Tremco; [www.tremcosealants.com](http://www.tremcosealants.com).
  - 5. Polymeric Systems Inc.; [www.polymericsystems.com](http://www.polymericsystems.com).
  - 6. Schnee-Moorehead Inc.; [www.trustsm.com](http://www.trustsm.com).
  - 7. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
- B. Polyurethane Sealants:
  - 1. Sonneborn, Division of ChemRex Inc.; [www.chemrex.com](http://www.chemrex.com).
  - 2. Tremco; [www.tremcosealants.com](http://www.tremcosealants.com).
  - 3. Sika Corporation, Inc.; [www.sikaconstruction.com](http://www.sikaconstruction.com)
- C. Polysulfide Sealants:
  - 1. Meadow, W. R., Inc.; [www.wrmeadows.com](http://www.wrmeadows.com).
  - 2. Pacific Polymers, Inc.; [www.pacpoly.com](http://www.pacpoly.com).
- D. Acoustical Sealants:
  - 1. United States Gypsum Co.; [www.usg.com](http://www.usg.com)
  - 2. Pecora CorporationNone; [www.pecora.com](http://www.pecora.com).
- E. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.03 SEALANTS

- A. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168.
- B. Acrylic Emulsion Latex Sealants: Comply with ASTM C 834, Type O P, Grade NF.
  - 1. Pecora Corporation; Product AC-20+: [www.pecora.com](http://www.pecora.com).
  - 2. Sonneborn, Division of ChemRex Inc.; Product Sonolac: [www.chemrex.com](http://www.chemrex.com).
  - 3. Tremco; Product Tremflex 834: [www.tremcosealants.com](http://www.tremcosealants.com).
- C. Preformed Joint Sealants and Products:
  - 1. Tremco; Product Spectrem Ez Seal: [www.tremcosealants.com](http://www.tremcosealants.com).
  - 2. Pecora Corporation; Product Sil-Span: [www.pecora.com](http://www.pecora.com).
  - 3. GE Silicones; Product UltraSpan US1100: [www.gesilicones.com](http://www.gesilicones.com).
  - 4. Dow Corning Corporation; Product 123 Silicone Seal: [www.dowcorning.com](http://www.dowcorning.com).
- D. Preformed Compressible Foam Sealers:
  - 1. Emseal Joint Systems, Ltd; Product Emseal 25V: [www.emseal.com](http://www.emseal.com).
  - 2. Sandell Manufacturing Company, Inc; Product Polyseal: [www.sandellmfg.com](http://www.sandellmfg.com).
  - 3. illbruck Sealant Systems, Inc.; Product Universal Foam Sealant: [www.illbruck.com](http://www.illbruck.com)
  - 4. Polytite Manufacturing Corporation; Products Polytite B, Polytite Standard: [www.polytite.com](http://www.polytite.com)
- E. Acoustical Sealant: Butyl or acrylic sealant; ASTM C 834, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.
  - 1. Product: AC-20 FTR Acoustical and Insulation Sealant manufactured by Pecora.
  - 2. Product: Sheetrock Acoustical Sealant manufactured by United States Gypsum.
  - 3. Applications: Use for concealed locations only:

- a. Sealant bead between top stud runner and structure and between bottom stud track and floor.
- F. Acrylic Emulsion Latex: ASTM C 834, single component, non-staining, non-bleeding, non-sagging.
  - 1. Color: Colors as selected, Type OP (opaque).
  - 2. Product: AC-20+ manufactured by Pecora Corporation.
  - 3. Product: Sonolac manufactured by Sonneborn, Division of ChemRex Inc.
  - 4. Product: Tremflex 834 manufactured by Tremco.
- G. Self-Leveling Polysulfide Sealant: ASTM C 920, Grade P, Class 25, Uses T, I, M, A, O; two component, chemical curing, non-staining, non-bleeding, capable of continuous water immersion, self-leveling type.
  - 1. Product: Deck-O-Seal manufactured by W. R. Meadows, Inc..
  - 2. Product: Elastoseal 227, Type 1 manufactured by Pacific Polymers, Inc..
  - 3. Movement Capability: Plus and minus 25 percent.
- H. Nonsag Polyurethane Sealant: ASTM C 920, Grade NS, Class 25, Uses T, NT, M, A, O; single component, chemical curing, non-staining, non bleeding, non-sagging type.
  - 1. Product: Sikaflex - 1a manufactured by Sika corporation, Inc..
  - 2. Product: Ultra manufactured by Sonneborn, Division of ChemRex Inc..
  - 3. Product: NP 1 manufactured by Sonneborn, Division of ChemRex Inc..
  - 4. Product: Vulkem 116 manufactured by Tremco.
- I. Nonsag Polyurethane Sealant: ASTM C 920, Grade NS, Class 100/50, Uses NT, M, A, O; single component, chemical curing, non-staining, non bleeding, non-sagging type.
  - 1. Product: Sikaflex-15 LM manufactured by Sika corporation, Inc..
  - 2. Product: Vulkem 921 manufactured by Tremco.
- J. Self-Leveling Polyurethane Sealant: ASTM C 920, Grade P, Class 25, Uses T, NT, M, A, O; single component, chemical curing, non staining, non bleeding, self-leveling type.
  - 1. Product: Sikaflex-1C SL manufactured by Sika Corporation, Inc..
  - 2. Product: Sonolastic SL 1 manufactured by Sonneborn, Division of ChemRex Inc..
- K. Silicone Sealant: ASTM C 920, Grade NS, Class 50, Uses NT, A, M, G, O; single component, neutral curing, and non-staining to porous substrates per ASTM C 1248.
  - 1. Product: SilPruf LM SCS2700 manufactured by GE Silicones.
  - 2. Product: Omniseal manufactured by Sonneborn, Division of ChemRex Inc..
  - 3. Product: Spectrem 1 manufactured by Tremco.
  - 4. Product: 790 manufactured by Dow Corning.
  - 5. Product: 791 manufactured by Dow Corning.
  - 6. Product: 795 manufactured by Dow Corning.
- L. Silicone Sealant: ASTM C 920, Grade NS, Class 25, Uses NT, A, G; single component, neutral curing, and non-sagging.
  - 1. Product: 799 manufactured by Dow Corning.
  - 2. Product: UltraGlaze SSG 4000 manufactured by GE Silicones.
  - 3. Product: UltraGlaze SSG 4000AC manufactured by GE Silicones.
  - 4. Product: PSI-631 manufactured by Polymeric Systems Inc..
  - 5. Product: SM 5731 Poly-Glaze Plus manufactured by Schnee-Morehead, Inc..
  - 6. Product: Proglaze SG manufactured by Tremco.
  - 7. Product: Tremsil 600 manufactured by Tremco.
- M. Silicone Sealant: ASTM C 920, Grade NS, Class 25, Uses NT, A, G, O; single component, neutral curing, and mildew and fungus resistant.
  - 1. Product: 898 manufactured by Pecora Corporation.
  - 2. Product: Tremsil 600 White manufactured by Tremco.

## 2.04 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant and non-staining; ASTM D 1056, sponge or expanded rubber; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- E. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

### 3.02 PREPARATION

- A. Ensure proper joint design practices are followed allowing for a 2:1 width to depth ratio.
- B. Joint dimensions should allow for ¼" (6.35 mm) minimum and ½" (12.7 mm) maximum thickness for sealant.
- C. Remove loose materials, foreign matter, incompressibles, and free water which might impair adhesion of sealant. Concrete joints must be clean and dry.
- D. Clean and prime joints in accordance with manufacturer's instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- E. Install backer rod or joint filler to control depth of joint sealant per depth ratio requirements.
- F. Perform preparation in accordance with manufacturer's instructions and ASTM C 1193.
- G. Protect elements surrounding the work of this section from damage or disfigurement.
- H. Masking Tape: Use masking tape to prevent contact of sealant with adjoining surfaces that would be permanently stained or damaged by contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C 1193.
- C. Perform acoustical sealant application work in accordance with ASTM C 919.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

- G. Tool joints to match existing or concave per Figure 5A in ASTM C 1193.
- H. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface. ....
- I. Compression Gaskets: Avoid joints except at ends, corners, and intersections; seal all joints with adhesive; install with face 1/8 to 1/4 inch below adjoining surface.

### 3.04 CLEANING

- A. Clean adjacent soiled surfaces as the work progresses in compliance with the sealant manufacturers written instructions.

### 3.05 PROTECTION OF FINISHED WORK

- A. Protect sealants until cured.

### 3.06 SEALANT APPLICATION SCHEDULE

- A. Exterior vertical and horizontal nontraffic construction joints in cast-in-place concrete.
  - 1. Joint Sealant: Single-component nonsag polyurethane sealant.
- B. Exterior horizontal isolation and contraction and where indicated at joints in cast-in-place concrete slabs.
  - 1. Joint Sealant: Single-component pourable polyurethane sealant.
- C. Exterior vertical control and expansion joints in unit masonry.
  - 1. Joint Sealant: Single-component nonsag polyurethane sealant.
- D. Exterior butt joints between metal panels.
  - 1. Joint Sealant: Single-component nonsag polyurethane sealant.
- E. Exterior perimeter joints between masonry and frames of doors windows and louvers and other metal frames.
  - 1. Joint Sealant: Single-component nonsag polyurethane sealant.
- F. Exterior control and expansion joints in ceilings and other overhead surfaces.
  - 1. Joint Sealant: Single-component nonsag polyurethane sealant.
- G. Vertical control and expansion joints on exposed interior surfaces of exterior walls.
  - 1. Joint Sealant: Latex sealant.
- H. Interior perimeter joints of exterior openings.
  - 1. Joint Sealant: Latex sealant.
- I. Interior joints between plumbing fixtures and adjoining walls, floors, and counters.
  - 1. Joint Sealant: Single-component mildew-resistant neutral-curing silicone sealant.
- J. Vertical joints on exposed surfaces of interior unit masonry walls.
  - 1. Joint Sealant: Single-component nonsag polyurethane sealant
- K. Vertical joints on exposed surfaces of interior unit masonry walls.
  - 1. Joint Sealant: Single-component nonsag polyurethane sealant

- L. Perimeter joints between interior wall surfaces and frames of interior doors windows.
  - 1. Joint Sealant: Latex sealant.
- M. Perimeter joints between interior unit masonry walls and concrete slab.
  - 1. Joint Sealant: Single-component Low VOC nonsag polyurethane sealant, approved for interior use

**END OF SECTION 07 90 00**

**SECTION 08 40 00****ENTRANCES AND STOREFRONTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Interior Aluminum-Framed Storefront.
- B. Exterior Aluminum-Framed Storefront.
- C. Aluminum framing members.
- D. Storefront doors.

**1.02 RELATED SECTIONS**

- A. Section 07 90 00 - Joint Sealers: Perimeter sealant and back-up materials.
- B. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.
- C. Section 08 80 00 - Glazing: Glass and glazing accessories.

**1.03 REFERENCES**

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2004.
- B. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 2003 (part of AAMA 501).
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association; 1998.
- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2005.
- E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2002.
- F. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2005.
- G. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.
- H. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2004.
- I. ASTM B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2004.
- J. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2004a.
- K. ASTM B 221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2004.

- L. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
- M. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2002.
- N. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000.
- O. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

#### 1.04 PERFORMANCE REQUIREMENTS

- A. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
  - 1. Design Wind Loads: Comply with requirements of ASCE 7.
  - 2. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
- B. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
- C. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ASTM E 283.
- D. Condensation Resistance Factor: CRF of 64 or greater when measured in accordance with AAMA 1502.7-1981.
- E. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 8.00 lbf/sq ft.
- F. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
- G. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.
- H. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

#### 1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions; describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details and finish.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

- D. Design Data: Provide framing member structural and physical characteristics, dimensional limitations.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- F. Report of field testing for water leakage.
- G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### 1.06 QUALITY ASSURANCE

- A. Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State in which the Project is located.
- B. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

#### 1.07 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.

#### 1.08 DELIVERY, STORAGE, AND PROTECTION

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond to aluminum when exposed to sunlight or weather.

#### 1.09 PROJECT CONDITIONS

- A. Coordinate the work with installation of air barrier and vapor retarder components or materials.

#### 1.10 ENVIRONMENTAL REQUIREMENTS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

#### 1.11 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Kawneer Company, Inc; [www.kawneer.com](http://www.kawneer.com) (Basis of Design)
- B. Tubelite Company, Inc.; [www.tubelite.com](http://www.tubelite.com)
- C. United States Aluminum Corp: [www.usalum.com](http://www.usalum.com)
- D. EFCO Corporation; [www.efcocorp.com](http://www.efcocorp.com)
- E. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 COMPONENTS

- A. Interior Aluminum Framed Storefronts: Factory fabricated, factory finished aluminum framing members, including perimeter trims, stools, accessories, shims, anchors, clips and sealing of storefront units.
  - a. Basis of Design: Kawneer Trifab 450, 1 3/4" x 4 1/2" nominal dimension, non-thermal system.
  - b. Finish: To match existing, field verify
- B. Exterior Aluminum Framed Storefronts and Window Openings: Factory fabricated, factory finished aluminum framing members with infill and related flashing, anchorage and attachment devices including all specialized clips necessary to attach the system to the openings and/or structure to meet the design criteria.
  - a. Basis of Design: Kawneer Trifab VersaGlaze 601 Thermal Storefront System, 2" x 6" nominal dimension system.
  - b. Structurally Reinforced members: Formed sheet aluminum with internal reinforcement of structural steel members.
  - c. Finish: To match existing, field verify
- C. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
  - 1. Framing members for interior applications need not be thermally broken.
  - 2. Glazing stops: Applied.
  - 3. Structurally Reinforced Members: Formed sheet aluminum with internal reinforcement of structural steel member.
- D. Storefront Doors:
  - 1. Glazed aluminum
    - a. Manufacturer: Kawneer Company Inc.
    - b. 500 Standard Entrances
    - c. Wide Stile
    - d. Top Rail: 5 inches wide.
    - e. Vertical Stiles: 5 inches wide, Wide Stile.
    - f. Bottom Rail: 6 1/2 inches wide.
    - g. Depth: 1 3/4"
    - h. Glazing Stops: Square.
    - i. Finish: Same as storefront.

## 2.03 MATERIALS

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M).
- B. Sheet Aluminum: ASTM B 209 (ASTM B209M).
- C. Structural Steel Sections: ASTM A 36/A 36M; galvanized in accordance with requirements of ASTM A 123/A 123M.
- D. Fasteners: Stainless steel.

- E. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.
- F. Concealed Flashings: 0.018 inch thick aluminum.
- G. Perimeter Sealant: Type as specified in Section 07 90 00.
- H. Glass: As specified in Section 08 80 00.
- I. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- J. Glazing Accessories: As specified in Section 08 80 00.
- K. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

## 2.04 FINISHES

- A. Kawnear Permacoat™ AAMA 2604, Powder Coating (Color 'Sea Wolf' to match existing).
- B. Touch-Up Materials: As recommended by coating manufacturer for field application.

## 2.05 HARDWARE

- A. Door Hardware: As specified in Section 08 71 00.
- B. Weatherstripping: Wool pile, continuous and replaceable; provide on all exterior doors.
- C. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all exterior doors.

## 2.06 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
- E. Arrange fasteners and attachments to conceal from view.
- F. Reinforce components internally for door hardware and door operators.
- G. Reinforce framing members for imposed loads.
- H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
  - 1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

### 3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form watertight dam.
- G. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Install operating sash.
- J. Set thresholds in bed of mastic and secure.
- 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 90 00.

### 3.03 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

### 3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.
- B. Test installed storefront for water leakage in accordance with AAMA 501.2.
  - 1. Field test areas as directed by the Architect.

### 3.05 ADJUSTING

- A. Adjust operating hardware and sash for smooth operation.

### 3.06 CLEANING AND PROTECTION

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.
- D. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
- E. Protect finished work from damage.

**END OF SECTION 08 40 00**

**SECTION 08 71 00****DOOR HARDWARE****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. Mechanical door hardware for the following:
    - a. Swinging doors.
  - 2. Cylinders for door hardware specified in other Sections.
  - 3. Electrified door hardware.

- B. Related Sections:

- 1. Division 08 Section "Aluminum Framed Entrances and Storefronts"

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, and profiles, and finishes.
- B. Shop Drawings: Details of electrified door hardware, indicating the following:
  - 1. Wiring Diagrams: For power, signal, and control wiring and including the following:
    - a. Details of interface of electrified door hardware and building safety and security systems.
    - b. Schematic diagram of systems that interface with electrified door hardware.
    - c. Point-to-point wiring.
    - d. Risers.
    - e. Elevations doors controlled by electrified door hardware.

2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

C. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
    - a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
    - b. Format: Use same scheduling sequence and format **and use same door numbers** as in the Contract Documents.
    - c. Content: Include the following information:
      - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
      - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
      - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
      - 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
      - 5) Fastenings and other pertinent information.
      - 6) Explanation of abbreviations, symbols, and codes contained in schedule.
      - 7) Mounting locations for door hardware.
      - 8) List of related door devices specified in other Sections for each door and frame.
  2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.
- D. Product Certificates: For electrified door hardware, from the manufacturer.
1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
- E. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

- F. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.
- G. Warranty: Special warranty specified in this Section.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
- B. Source Limitations: Obtain each type of door hardware from a single manufacturer.
  - 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.
- C. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.
- D. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- E. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- F. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC/ANSI A117.1.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- D. Deliver keys to Owner.

## 1.6 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Security: Coordinate installation of door hardware, keying, and access control with Owner's representative.
- C. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

## 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fails in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including excessive deflection, cracking, or breakage.
    - b. Faulty operation of doors and door hardware.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
  - 2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled on Drawings to comply with requirements in this Section.
  - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
  - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, function, finish, size, and other distinctive qualities of each type of door hardware are indicated on the drawings. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements.

## 2.2 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollowmetal doors and hollow-metal frames.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

- a. Baldwin Hardware Corporation.
- b. IVES Hardware; an Ingersoll-Rand company.
- c. McKinney Products Company; an ASSA ABLOY Group company.
- d. Stanley Commercial Hardware; Div. of The Stanley Works.
- e. SELECT Products Limited.

## 2.3 MECHANICAL LOCKSETS

A. Lock Functions: As indicated on drawings and in hardware sets.

## 2.4 LOCK CYLINDERS

A. Lock Functions: As indicated on drawings and in hardware sets.

B. Yale Cylinders, no substitutions.

## 2.5 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A.

B. Keying to match owner's Grand Master System.

C. Key each cylinder to:

1. Owner's Grand Master.
2. Building Master.

3. Individual change key.

## 2.6 SURFACE CLOSERS

- A. Surface Closers: LCN 4000 series; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force with parallel arm configuration.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or approved equal.

## 2.7 MECHANICAL STOPS AND HOLDERS

- A. Wall-Mounted Stops: BHMA A156.16; polished cast brass, bronze, or aluminum base metal.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - a. Corbin Russwin Architectural Hardware; an ASSA Abloy Group
  - b. Baldwin Hardware Corporation.
  - c. IVES Hardware; an Ingersoll-Rand company.
  - d. Rockwood Manufacturing Company..

## 2.8 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - a. National Guard Products.
  - b. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
  - c. Hager Companies.

## 2.9 FABRICATION

- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.
- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
  2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
  3. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."

## 2.10 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

### 3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
  - 1. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
  - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.

- E. Lock Cylinders: Install construction cores to secure building and areas during construction period.
  - 1. Replace construction cores with permanent cores.
- F. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- G. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- H. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- I. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- J. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

### 3.4 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
  - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
  - 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

### 3.5 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

**PART 4 – HARDWARE SCHEDULE****Hardware Set # 01**

Doors: A142

Each to receive:

|   |    |                            |           |          |
|---|----|----------------------------|-----------|----------|
| 1 | EA | Re-use Balance of Hardware |           | Existing |
| 1 | EA | Wall Stop                  | 409 US26D | Rockwood |

**Hardware Set # 02**

Doors: A143

Each to receive:

|   |    |                  |                |          |
|---|----|------------------|----------------|----------|
| 1 | EA | Continuous Hinge | 112XY 628      | Ives     |
| 1 | EA | Classroom Lock   | L9070L 06A 626 | Schlage  |
| 1 | EA | Core             | AS REQUIRED    | Sargent  |
| 1 | EA | Wall Stop        | 409 US26D      | Rockwood |

**END OF SECTION 08 71 00**

**SECTION 08 80 00  
GLAZING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Glass.
- B. Glazing compounds and accessories.

**1.02 RELATED SECTIONS**

- A. Section 07 90 00 - Joint Sealers: Sealant and back-up material.
- C. Section 08 40 00 – Entrances and Storefronts.

**1.03 REFERENCES**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 1999 (Reapproved 2005).
- C. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2002.
- D. ASTM C 1036 - Standard Specification for Flat Glass; 2001.
- E. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2004.
- F. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005.
- G. ASTM E 773 - Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units; 2001.
- H. ASTM E 774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units; 1997.
- I. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2004.
- J. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 1990.

**1.04 PERFORMANCE REQUIREMENTS**

- A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
  - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
  - 2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
  - 3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

**1.05 SUBMITTALS**

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

- D. Certificates: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Certificate: Certify that insulated types of glass meets or exceeds specified requirements.

#### 1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.

#### 1.07 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.

#### 1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not install glazing when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

#### 1.09 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five (5) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

### **PART 2 PRODUCTS**

#### 2.01 FLAT GLASS MATERIALS

- A. Manufacturers:
  - 1. AFG Industries, Inc: [www.afgglass.com](http://www.afgglass.com).
  - 2. Guardian Glass (Basis of Design - IG):
  - 3. PPG Industries, Inc: [www.ppg.com](http://www.ppg.com).
  - 4. Visteon Glass Systems: [www.visteon.com/floatglass](http://www.visteon.com/floatglass).
  - 5. Substitutions: Refer to Section 01600 - Product Requirements.
- B. Clear Float Glass: Clear, annealed.
  - 1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
  - 2. Comply with ASTM C 1048.
  - 3. 6 mm minimum thick.
- C. Safety Glass: Clear; fully tempered with horizontal tempering.
  - 1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
  - 2. Comply with 16 CFR 1201 test requirements for Category II.
  - 3. 6 mm minimum thick.
- D. Low E Glass: Float type, heat strengthened, clear.
  - 1. Comply with ASTM C 1036, Type I, transparent flat, Quality Q3 (glazing select).
  - 2. Comply with ASTM C 1048.
  - 3. 6 mm minimum thick.
- E. Spandrel Glass: Heat strengthened, clear.
  - 1. Ceramic fused frit of solid color as selected by Architect on interior back surface, No. 4.
  - 2. Comply with ASTM C 1036 Type I, transparent flat, Quality Q3.

3. Comply with ASTM C 1048.
4. 6 mm thick.

## 2.02 SEALED INSULATING GLASS MATERIALS

- A. Manufacturers:
  1. Any of the manufacturers listed under Flat Glass Materials.
- B. Insulated Glass Units: Double pane with glass to elastomer edge seal.
  1. Outer pane of clear glass, inner pane of Low E glass or Security Glass (see drawings for locations)
  2. Place Low E coating on No. 2 surface within the unit.
  3. Comply with ASTM E 774 and E 773, Class CBA.
  4. Purge interpane space with dry hermetic air.
  5. Total unit thickness of 1 inch minimum.
  6. Visible light transmittance of 68percent, Reflectance out 11%, Reflectance in 12%, U – Value .29 Solar Heat Gain Coefficient .38, Light to Solar Gain 1.80
- C. Insulated Spandrel Glass Units: Double pane with glass to elastomer edge seal.
  1. Outer pane of clear glass, inner pane of Spandrel glass.
  2. Place Low E coating on No. 2 surface within the unit.
  3. Comply with ASTM E 774 and E 773, Class CBA.
  4. Purge interpane space with dry hermetic air.
  5. Total unit thickness of 1 inch minimum.

## 2.04 GLAZING COMPOUNDS

- A. Manufacturers:
  1. Bostik, Inc: [www.bostik-us.com](http://www.bostik-us.com).
  2. GE Plastics: [www.geplastics.com](http://www.geplastics.com).
  3. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
  4. Degussa Building Systems: [www.chemrex.com](http://www.chemrex.com).
  5. Substitutions: Refer to Section 01600 - Product Requirements.
- B. Butyl Sealant: Single component; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; Shore A hardness of 10 to 20; black color; non-skinning.
- C. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; Shore A Hardness Range 20 to 35; color as selected.
- D. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; color as selected.

## 2.04 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
- C. Glazing Tape: Preformed butyl compound; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.

1. Manufacturers:
  - a. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
  - b. Saint-Gobain Performance Plastics: [www.plastics.saint-gobain.com](http://www.plastics.saint-gobain.com).
  - c. Substitutions: Refer to Section 01600 - Product Requirements.

D. Glazing Clips: Manufacturer's standard type.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

### **3.02 PREPARATION**

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.
- E. Install sealant in accordance with manufacturer's instructions.

### **3.03 INSTALLATION - EXTERIOR WET METHOD (SEALANT AND SEALANT)**

- A. Place setting blocks at 1/4 points and install glazing pane or unit.
- B. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.
- C. Fill gaps between glazing and stops with sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.
- D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### **3.04 INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND)**

- A. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
- B. Locate and secure glazing pane using glazers' clips.
- C. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

### **3.05 CLEANING**

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

**END OF SECTION**

**SECTION 09 21 16**  
**GYPSUM BOARD ASSEMBLIES**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Metal stud wall framing.
- B. Metal channel ceiling framing.
- C. Gypsum wallboard.
- D. Joint treatment and accessories.

**1.02 RELATED SECTIONS**

- A. Section 07 90 00 - Joint Sealers

**1.03 REFERENCES**

- A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- B. AISI SG-971 - Specification for the Design of Cold-Formed Steel Structural Members; 1996, with 2000 Supplement.
- C. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2004a.
- D. ASTM C 475/C 475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002.
- E. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members; 2004a.
- F. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2004.
- G. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board; 2004a.
- H. ASTM C 954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2004.
- I. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2004.
- J. ASTM C 1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2004.
- K. ASTM C 1177/C 1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2004.
- L. ASTM C 1396/C 1396M - Standard Specification for Gypsum Board; 2004.

- M. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 1997a.
- N. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2000.
- O. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 1996.
- P. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2003.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing, gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- D. Submittals for Environmental Performance:
  - 1. Resource efficient product data: Submit required information concerning project recyclability (packaging), product recycled content, and product recyclability.
  - 2. Recycled Content:
    - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
    - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
    - c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
    - d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
  - 3. Local/Regional Materials:
    - a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
    - b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
    - c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
    - d. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.
  - 4. VOC data: Submit manufacturer's product data for joint compounds. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.

#### 1.05 QUALITY ASSURANCE

- A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.
- B. Applicator Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 3 years of documented experience.

#### 1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for fire rated assemblies as indicated on drawings.

## **PART 2 - PRODUCTS**

### **2.01 METAL FRAMING MATERIALS**

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
1. Clark Steel Framing Systems: [www.clarksteel.com](http://www.clarksteel.com).
  2. Dale/Incor: [www.daleincor.com](http://www.daleincor.com).
  3. Dietrich Metal Framing: [www.dietrichindustries.com](http://www.dietrichindustries.com).
  4. Marino-Ware: [www.marinoware.com](http://www.marinoware.com).
  5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Metal Framing Connectors and Accessories:
1. Same manufacturer as framing.
  2. The Steel Network Inc: [www.SteelNetwork.com](http://www.SteelNetwork.com).
  3. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
1. Studs: "C" shaped with flat or formed webs.
  2. Runners: U shaped, sized to match studs.
  3. Ceiling Channels: C shaped.
  4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
- D. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 40 00.
- E. Ceiling Hangers: Type and size as specified in ASTM C 754 for spacing required.
- F. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
  2. Material: ASTM A 653/A 653M steel sheet, SS Grade 50, with G60/Z180 hot dipped galvanized coating.
  3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
  4. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
- G. General Environmental Concerns
1. Provide metal framing products containing high levels of post industrial and/or post-consumer recycled content.

### **2.02 GYPSUM BOARD MATERIALS**

- A. Manufacturers:
1. G-P Gypsum Corporation: [www.gp.com/build](http://www.gp.com/build).
  2. National Gypsum Company: [www.nationalgypsum.com](http://www.nationalgypsum.com).
  3. USG: [www.usg.com](http://www.usg.com).
  4. BPB America Inc.: [www.bpb-na.com](http://www.bpb-na.com)
  5. Substitutions: See Section 01 60 00 - Product Requirements.

- B. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
1. Special Type X: Fire resistant in excess of ASTM C 1396/C 1396M requirements, UL or WH rated.
    - a. Application: Where required for fire-rated assemblies, unless otherwise indicated.
    - b. Thickness: 5/8 inch, as indicated.
    - c. Edges: Tapered.
  2. Ceiling Board: Special sag-resistant type.
    - a. Application: Ceilings, unless otherwise indicated.
    - b. Thickness: 5/8 inch, as indicated.
    - c. Edges: Tapered.
  3. Abuse-Resistant Type: Gypsum wallboard especially formulated for increased impact resistance, with enhanced gypsum core and heavy duty face and back paper.
    - a. Application: Heavy Duty, Level 3.
    - b. Core Type: Regular and Type X, as indicated.
    - c. Thickness: 1/2 inch, 5/8 inch, as indicated.
    - d. Edges: Tapered.
  3. Mold-Resistant Gypsum Wallboard: Mold/Mildew/Moisture resistant core per ASTM D3273 & ASTM G21
    - a. Application: Wet areas or as indicated on drawings
    - b. Core Type: mold-resistant gypsum core
    - c. Thickness: 5/8 inch, as indicated.
    - d. Edges: Tapered.
- C. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas.
  2. Edges: Tapered.

## 2.04 ACCESSORIES

- A. Acoustic Insulation: As specified in Section 07 21 00.
- B. Air and Moisture Barrier: As specified in Section 07 25 00.
- C. Acoustic Sealant: As specified in Section 07 90 00.
- D. Building Paper: Asphalt impregnated, No. 15 building felt, conforming to ASTM D 226, Type I.
- E. Finishing Accessories: ASTM C 1047, galvanized steel or rolled zinc, unless otherwise indicated.
  1. Types: As detailed or required for finished appearance.
  2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead at exposed panel edges.
- F. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions.
  1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
  2. Ready-mixed vinyl-based joint compound.
  3. Chemical hardening type compound.
- G. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving increased abrasion and impact resistance.
  1. Product: Tuff-Hide manufactured by USG Abuse-Resistant Systems.
- H. Screws: ASTM C 1002; self-piercing tapping type.

- I. Screws: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.
- J. If adhesives are used, see the applicable LEED-NC 2009 Reference Guide for the most current VOC limits for adhesives. This project is not pursuing LEED certification.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that project conditions are appropriate for work of this section to commence.

#### **3.02 FRAMING INSTALLATION**

- A. Metal Framing: Comply with ASTM C 754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
  - 1. Level ceiling system to a tolerance of 1/600.
  - 2. Laterally brace entire suspension system.
  - 3. Install bracing as required at exterior locations to resist wind uplift.
- C. Studs: Space studs as indicated.
  - 1. Extend partition framing to structure in all locations and provide diagonal bracing as necessary to maintain wall deflection requirements.
  - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
  - 3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- E. Standard Wall Furring: Install at masonry walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
  - 1. Orientation: Horizontal.
  - 2. Spacing: As permitted by standard.
- F. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.
- G. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.
- H. Blocking: Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and countertops. Bolt or screw steel channels to studs.

#### **3.03 ACOUSTIC ACCESSORIES INSTALLATION**

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
  - 1. Place one bead continuously on substrate before installation of perimeter framing members.
  - 2. Place continuous bead at perimeter of each layer of gypsum board.

3. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.

### 3.04 GYPSUM BOARD AND GLASS MAT FACED BOARD INSTALLATION

- A. Comply with ASTM C 840 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
  1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
- D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of listing authority.
- E. Gypsum Soffit Board: Install perpendicular to framing, with staggered end joints over framing members or other solid backing.
- F. Glass Mat Faced Gypsum Board: Install in strict accordance with manufacturer's instructions.
- G. Installation on Metal Framing: Use screws for attachment of all gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.
- H. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.
- I. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

### 3.05 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
  1. Not more than 30 feet apart on walls and ceilings over 50 feet long – unless noted otherwise.
  2. At exterior soffits, not more than 30 feet apart in both directions, unless noted otherwise.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

### 3.06 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Board: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
- B. Paper Faced Gypsum Board: Use fiberglass joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- C. Finish gypsum board in scheduled areas in accordance with levels defined in ASTM C 840 and as scheduled below.

- D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
  - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
  - 2. Taping, filling, and sanding is not required at surfaces behind fixed cabinetry and full-height backsplashes.
  - 3. Taping, filling and sanding is not required at base layer of double layer applications.
- E. Spray apply high build drywall surfacer over entire surface after joints have been properly treated to achieve Level 5 finish in areas indicated.

### 3.07 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

### 3.08 FINISH LEVEL SCHEDULE

- A. Level 1: Above finished ceilings concealed from view.
- B. Level 2: Utility areas and areas behind cabinetry.
- C. Level 3: Walls scheduled to receive textured wall finish.
- D. Level 4: Walls and ceilings scheduled to receive flat or eggshell paint finish.
- E. Level 5: Walls and ceilings scheduled to receive semi-gloss or gloss paint finish.

### 3.09 SITE ENVIRONMENTAL PROCEDURES

- A. Indoor Air Quality:
  - 1. Temporary ventilation: Provide temporary ventilation for work of this Section.
  - 2. Multi-layer gypsum board: Screw attach. Adhesive attachment alone will not be permitted.
- B. Waste Management: See Section 01 74 19 - Construction Waste Management and Disposal and as follows:
  - 1. Select panel sizes and layout panels to minimize waste; reuse cutoffs to the greatest extent possible.

**END OF SECTION 09 21 16**

**SECTION 09 51 00****SUSPENDED ACOUSTICAL CEILINGS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

**1.02 RELATED SECTIONS**

- A. Section 28 31 01 - Fire Alarm System: Fire alarm components in ceiling system.
- B. Section 21 13 00 - Fire Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
- C. Section 23 37 00 - Air Outlets and Inlets: Air diffusion devices in ceiling.
- D. Section 26 51 00 - Interior Lighting: Light fixtures in ceiling system.
- E. Section 27 31 01 - Communication System: Speakers in ceiling system.

**1.03 REFERENCES**

- A. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2004.
- B. ASTM C 636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2004.
- C. ASTM E 580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 2002.
- D. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products; 1998.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit two samples 12 x 12 inch in size illustrating material and finish of acoustical units.
- D. Manufacturer's Installation Instructions: Indicate special procedures.

**1.05 SURPLUS MATERIALS**

- A. 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: Provide 5 percent of total acoustical unit area of each type of acoustical unit for the owners 's use in maintenance of project. At minimum, furnish to

- Owner any opened cartons and two (2) unopened cartons for each ceiling tile type.
2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

#### 1.06 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

#### 1.07 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

#### 1.08 PROJECT CONDITIONS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical units after interior wet work is dry.

#### 1.09 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
  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. Grid: Ten (10) 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.

### **PART 2 PRODUCTS**

#### 2.01 ACOUSTICAL UNITS

- A. Manufacturers:
  1. Armstrong World Industries, Inc: [www.armstrong.com](http://www.armstrong.com). (Basis of Design)
  2. BPB Celotex: [www.bpb-na.com](http://www.bpb-na.com).
  3. USG: [www.usg.com](http://www.usg.com).
  4. Substitutions: See Section 01600 - Product Requirements.
- B. Acoustical Units - General: ASTM E 1264, Class A.
  1. Units for Installation in Fire-Rated Suspension System: Listed and classified for the fire-resistive assembly the suspension system is a part of.

- C. Acoustical Tile Type A:
  - 1. Size: 24 inch x 24 inch x 3/4 inch.
  - 2. Edge: Match Existing.
  - 3. Color: White.
  - 4. Product: USG Mars Climaplus (Basis of Design), or equal.
  - 5. Suspension System: Type SS-1.

## 2.02 SUSPENSION SYSTEM

- A. Manufacturers:
  - 1. Armstrong World Industries, Inc: [www.armstrong.com](http://www.armstrong.com) (Basis of Design).
  - 2. Chicago Metallic Corporation: [www.chicagometallic.com](http://www.chicagometallic.com).
  - 3. USG: [www.usg.com](http://www.usg.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
- C. Exposed Steel Suspension System Type SS-1: Formed steel, commercial quality cold rolled; heavy-duty.
  - 1. Profile: Tee; 9/16" Exposed Tee.
  - 2. Construction: Double web.
  - 3. Finish: White painted.

## 2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
  - 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
- C. Touch-up Paint: Type and color to match acoustical and grid units.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

### 3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:240.
- C. Locate system on room axis according to reflected plan.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
  - 1. Use longest practical lengths.
  - 2. Overlap and rivet corners.

### 3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units with pattern parallel to longest room axis.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
  - 1. Cut to fit irregular grid and perimeter edge trim.
  - 2. Make field cut edges of same profile as factory edges.
  - 3. Double cut and field paint exposed reveal edges.
- H. Where round obstructions and bullnose concrete block corners occur, provide preformed closures to match perimeter molding.
- I. Install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.
- J. Install hold-down clips on panels within 20 ft of an exterior door and as indicated on the drawings.

### 3.04 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

### 1.06 SITE ENVIRONMENTAL PROCEDURES

- A. Coordinate with manufacturer for a take-back program. Set aside scrap to be returned to manufacturer if possible.

**END OF SECTION 09 51 00**

**SECTION 09 65 00**  
**RESILIENT FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Resilient base
- B. Installation accessories.

**1.02 REFERENCES**

- A. ASTM E 648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2004.
- B. ASTM F 710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2005.
- C. ASTM F 1066 - Standard Specification for Vinyl Composition Floor Tile; 2004.
- D. ASTM F 1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing; 2004.
- E. ASTM F 1861 - Standard Specification for Resilient Wall Base; 2002.
- F. ASTM F 1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing; 2004.
- G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2006.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

**1.04 SURPLUS MATERIALS**

- A. Contractor to provide a minimum quantity of 2% overage, in addition to the amount necessary for installation, of each material specified for the owner's future use.

**1.05 DELIVERY, STORAGE, AND PROTECTION**

- A. Protect roll materials from damage by storing on end.

**1.06 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

**PART 2 PRODUCTS****2.03 MATERIALS - BASE**

- A. Resilient Base: ASTM F 1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:
  - 1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
  - 2. Height: 4 inch
  - 3. Thickness: 0.125 inch thick.
  - 4. Finish: Satin.
  - 5. Length: Roll.
  - 6. Color: As selected by architect from manufacturer's standards.
  - 7. Accessories: Premolded external corners and end stops.
  - 8. Manufacturers:
    - a. Johnsonite, Inc: [www.johnsonite.com](http://www.johnsonite.com).
    - b. Roppe Corp: [www.roppe.com](http://www.roppe.com).
    - c. Mannington: [www.mannington.com](http://www.mannington.com)
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

**2.04 ACCESSORIES**

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer. Low VOC, low odor, solvent-free, water-based contact adhesives meeting the requirements set forth in the applicable LEED-NC Reference Guide. This project is not pursuing LEED certification.
- D. Sealer: Types recommended by flooring manufacturer.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive resilient flooring.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Verify that sub-floor surfaces are dust-free and free of substances which would impair bonding of adhesive materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F 710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

**3.02 PREPARATION**

- A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

- B. Prohibit traffic until filler is cured.
- C. Clean substrate.
- D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

### 3.04 INSTALLATION - TILE FLOORING

- A. Install in accordance with manufacturer's instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place, press with heavy roller to attain full adhesion.
- E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- F. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. After installation of flooring, secure metal strips with stainless steel screws.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

### 3.05 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

### 3.06 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean, seal, and wax resilient flooring products in accordance with manufacturer's instructions.

### 3.07 SITE ENVIRONMENTAL PROCEDURES

- A. Indoor Air Quality:
  - 1. Temporary ventilation: Provide temporary ventilation as follows.
    - a. Ventilate products prior to installation. Remove from packaging and ventilate in a secure, dry, well-ventilated space free from strong contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degree F maximum continuously for minimum 72 hours.

**END OF SECTION 09 65 00**

**SECTION 09 68 00**  
**CARPETING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Carpet, direct-glued.
- B. Removal of existing carpet.
- C. Accessories.

**1.02 REFERENCES**

- A. CRI 104 - Standard for Installation of Commercial Textile Floorcovering Materials; Carpet and Rug Institute; 2002.

**1.03 SUBMITTALS**

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two samples 12 x 12 inch in size illustrating color and pattern for each carpet and cushion material specified.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum three years experience.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Mold and mildew prevention: Store on raised surface off concrete floors.

**1.06 SITE CONDITIONS**

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation

**1.04 SURPLUS MATERIALS**

- A. Contractor to provide a minimum quantity of 2% overage, in addition to the amount necessary for installation, of each material specified for the owner's future use.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Carpet:
  - 1. Interface, Inc (Basis of Design)
  - 2. Tarkett
  - 3. Shaw Contract
  - 4. Substitutions: See Section 01 60 00 - Product Requirements

**2.02 CARPET**

- A. Carpet Types
  - a. Type: Open Air 418
  - b. Color: To be selected by Architect
  - c. Pattern: Quarterturn

**2.03 ACCESSORIES**

- A. Sub-Floor Filler: Type recommended by carpet manufacturer.
- B. Seam Adhesive: Recommended by manufacturer.
- C. Contact Adhesive: Compatible with carpet material.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.
- B. Verify that sub-floor surfaces are dust-free and free of substances which would impair bonding of adhesives to sub floor surfaces.
- C. Verify that concrete sub-floor surfaces are ready for carpet installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by carpet manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

**3.02 PREPARATION**

- A. Remove existing carpet and carpet cushion.
- B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- D. Clean substrate.

**3.03 INSTALLATION - GENERAL**

- A. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104.

- B. Verify carpet match before cutting to ensure minimal variation between dye lots.
- C. Lay out carpet and locate seams in accordance with shop drawings:
  - 1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
  - 2. Do not locate seams perpendicular through door openings.
  - 3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
  - 4. Locate change of color or pattern between rooms under door centerline.
  - 5. Provide monolithic color, pattern, and texture match within any one area.
- D. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

#### 3.04 DIRECT-GLUED CARPET

- A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.
- B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
- C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.
- D. Roll with appropriate roller for complete contact of adhesive to carpet backing.
- E. Trim carpet neatly at walls and around interruptions.
- F. Complete installation of edge strips, concealing exposed edges.

#### 3.05 CLEANING

- A. Remove excess adhesive from floor and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.

**END OF SECTION 09 68 00**

**SECTION 09 90 00**  
**PAINTING AND COATING**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints and other coatings.
- C. Schedule - Surfaces to be finished at end of this Section.

**1.02 RELATED SECTIONS**

- A. Section 05 50 00 - Metal Fabrications: Shop-primed items.
- B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum Board.

**1.03 REFERENCES**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2003.
- C. ASTM D 523 - Standard Test Method for Specular Gloss; 1999.
- D. ASTM D 4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 1992 (Reapproved 2003).
- E. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

**1.04 DEFINITIONS**

- A. Conform to ASTM D 16 for interpretation of terms used in this section.
- B. Terms flat, eggshell, semi-gloss and gloss used in this section and drawing Finish Schedule refer to the following gloss ranges when tested in accordance with ASTM D 523 test method:
  - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at a 85 degree meter.
  - 2. Eggshell refers to a low-sheen finish with a gloss range between 5 and 20 when measured at a 60 degree meter.
  - 3. Satin refers to low-sheen finish with a gloss range below 15 and 35 when measured at a 60 degree meter.
  - 4. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60 degree meter.
  - 5. Full gloss refers to a high-sheen finish with a gloss range more than 65 when measured at a 60 degree meter.
- C. Gloss Ranges: Ranges indicated in the Finish Schedule take precedence over ranges indicated in this section.

### 1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on all finishing products, including VOC content.
- C. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.
- D. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.
- E. Certification: Provide certification that all coatings supplied are non-combustible and rated Class A for flame spread, fuel contribution, smoke development, and are compatible with materials, shop primers and coatings indicated.

### 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

### 1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

### 1.08 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

### 1.09 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

### 1.10 EXTRA MATERIALS

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Supply 5 gallons of each color and type; store where directed.
- C. Label each container with color, type, and room locations in addition to the manufacturer's label.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Paints:
  - 1. Sherwin Williams Company: [www.sherwin-williams.com](http://www.sherwin-williams.com).
  - 2. ICI Paints North America: [www.icipaintsinna.com](http://www.icipaintsinna.com).
  - 3. Benjamin Moore & Co: [www.benjaminmoore.com](http://www.benjaminmoore.com).
  - 4. PPG Architectural Finishes, Inc: [www.ppgaf.com](http://www.ppgaf.com).
  - 5. Grahams Paint: [www.grahampaint.com](http://www.grahampaint.com)
  - 6. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 MATERIALS

- A. Paint Coatings: Provide the best quality line of low-VOC paint from manufacturers listed.
- B. Color Standard: Sherwin Williams designations used to establish color and quality level.
- C. Provide same brand of prime coats as succeeding coats throughout the work. Do not mix paints of different manufacturers.
- D. Compatibility: Provide block fillers, primers, finish coat and related materials compatible with one another and substrates indicated under conditions of service and application. As demonstrated by manufacturer based on testing and field experience.

### 2.03 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
  - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
  - 2. For good flow and brushing properties.
  - 3. Capable of drying or curing free of streaks or sags.
- B. Chemical Content: The following compounds are prohibited:
  - 1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
  - 2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

### 2.04 PAINT/COATINGS SYSTEMS - EXTERIOR

- A. Ferrous Metals, Unprimed, Latex, 3 Coat:
  - 1. One coat of latex primer; 2.5 mils TDFT.
  - 2. Semi-gloss: Two coats of latex enamel; 1.3 mils TDFT.
- B. Ferrous Metals, Primed, Latex, 2 Coat:
  - 1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
  - 2. Semi-gloss: Two coats of latex enamel; 1.3 mils TDFT.
- C. Galvanized Metals, Latex, 3 Coat:
  - 1. One coat galvanize primer as recommended by the manufacturer.
  - 2. Semi-gloss: Two coats of latex enamel; 1.3 mils TDFT.
- D. Pavement Marking Paint:

1. Yellow: One coat; Traffic Marking Paint, 7 mils TDFT.
- E. Wood: 3 coat
  2. Satin: Three Coats of water-based polyurethane per manufacturer

## 2.04 PAINT/COATINGS SYSTEMS – LOW-VOC INTERIOR

- A. Wood, Clear Topcoat, 3 Coat:
  1. Satin: Three Coat Water-Based Topcoat
- B. Concrete Masonry Units (CMU), Opaque, Epoxy, 3 Coat:
  1. One coat of water based epoxy block filler; 10.0 mils TDFT.
  2. Semi-gloss: Two coats of high solids epoxy; 2.5 mils TDFT.
- C. Ferrous Metals, Unprimed, Latex, 3 Coat:
  1. One coat of latex primer; 2.5 mils TDFT.
  2. Semi-gloss: Two coats of latex enamel; 1.4 mils TDFT.
- D. Ferrous Metals, Primed, Alkyd, 2 Coat:
  1. Touch-up with alkyd base; 2.0 mils TDFT.
  2. Semi-gloss: One coat of alkyd interior enamel; 1.6 mils TDFT.
- E. Galvanized Metals, Latex, 3 Coat:
  1. One coat galvanize primer as recommended by the manufacturer.
  2. Semi-gloss: Two coats of latex enamel; 1.4 mils TDFT.
- F. Gypsum Board/Plaster, Latex, 3 Coat:
  1. One coat of latex primer sealer; 1.6 mils TDFT.
  2. Semi-gloss: Two coats of latex enamel; 1.4 mils TDFT.
  3. Eggshell: Two coats of latex enamel; 4.6 mils TDFT.
  4. Flat: Two coats of latex enamel; 1.6 mils TDFT.

## 2.06 ACCESSORY MATERIALS

- A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  1. Plaster and Gypsum Wallboard: 12 percent.

2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D 4442.

### 3.02 PREPARATION

- A. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- B. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
- C. Marks: Seal with shellac those which may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter in compliance with SSPC-SP13. Allow to dry. Fill minor defects with Block Filler (PrepRite by Sherwin Williams)
- F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- G. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- I. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent in compliance with SSPC-SP1.
- J. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
- K. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

### 3.03 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

### 3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Refer to Division 23 and Division 26 sections for schedule of color coding of equipment, duct work, piping, and conduit.

- B. Paint shop-primed equipment, where indicated.
- C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- D. Finish equipment, piping, conduit, and exposed duct work in utility areas in colors according to the color coding scheme indicated.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### 3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection and testing.
- C. Inspect and test questionable coated areas in accordance with Owner's requirements.

### 3.06 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

### 3.07 SCHEDULE - SURFACES TO BE FINISHED

- A. Do Not Paint or Finish the Following Items:
  - 1. Items fully factory-finished unless specifically noted.
  - 2. Fire rating labels, equipment serial number and capacity labels.
  - 3. Stainless steel items.
- B. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
  - 1. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.
  - 2. Paint all equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.
  - 3. Paint shop-primed items occurring in finished areas.
  - 4. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
  - 5. Paint dampers exposed behind louvers, grilles, to match face panels.
- C. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

**END OF SECTION 09 90 00**

**SECTION 12 24 13**  
**MANUALLY-OPERATED WINDOW SHADES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Manually-operated window shades and accessories.

**1.02 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog data, product descriptions, installation instructions, detail sheets, and specifications for each type system specified.
- C. Samples for Selection: Manufacturer's color chart and sample set.
- D. Shop Drawings: Prepared specifically for this project; show dimensions and interface with other products.
  - 1. Room schedule including field-verified dimensions of each opening to receive window shade systems.
  - 2. Shades are to be provided at all exterior windows except for corridors. Provide shades at all classroom exterior doors. Submittals should indicate all applicable locations.
  - 3. Indicate System Series, operator, fabric selection, and mounting type.

**1.03 QUALITY ASSURANCE**

- A. Installer: Approved by manufacturer.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to project site in manufacturer's original cartons.
- B. Individually package and mark shades with room number and opening number.
- C. Inspect the materials upon delivery to assure that specified products have been received.
- D. Store and handle shades to prevent damage to fabrics, finishes, and operators prior to installation.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. MechoShade Systems, Inc.: [www.mechoshade.com](http://www.mechoshade.com) (Basis of Design).
- C. Shade Techniques, Inc.: [www.shadetechniques.com](http://www.shadetechniques.com)
- D. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Provide window shade systems from a single manufacturer.

## 2.02 MANUFACTURED UNITS

- A. Manually-Operated Shades:
  - 1. Bead/Chain Operation: Bi-directional, wrap spring clutch made of high-strength fiberglass-reinforced polyester and high carbon steel.
  - 2. Product: MechoShade Mecho/5 Slimline or Standard drive end bracket.
- C. Visually Transparent Single-Fabric Shadecloth: Product MechoShade ThermoVeil group – Extra-Dense Linear Weave “0900 Series”, 0-1 percent visually translucent linear weave, single thickness, non-raveling, 0.030 inch thick vinyl fabric, woven from 0.018 inch diameter extruded vinyl yarn; 21 percent polyester, 79 percent reinforced vinyl.
  - 1. Color: As selected by Architect from manufacturer's standards colors.

## 2.03 COMPONENTS

- A. Drive Chain: No. 10 stainless steel chain rated for 90 lbs. minimum breaking strength. Nickel plate chain is not permitted.
  - 1. Provide Chain Guide to prevent choking hazard.
- B. Rollers: Roller assembly easily removable.
  - 1. Provide a roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection.
  - 2. Diameter: Greater than 1.54 inches for manual shades.
  - 3. Provide positive mechanical attachment of shade band material to roller band.
- C. Roller Idler Assembly for Manual Shades: Clutch operated rollers incorporating high-strength fiberglass-reinforced polyester gudgeon, which snaps-locks fascia.
- D. Fascia: Continuous, removable aluminum fascia that snap locks into shade bracket.
  - 1. Install across window width of shade band in one piece.
  - 2. Fully conceals brackets, shade roller and fabric on the tube.
  - 3. Provide end caps where mounting conditions expose outside of roller shade brackets.
  - 4. Notching of fascia for manual chain is not permitted.
- E. Multiple Shade Bands: Provide shade hardware system that allows for operation of multiple shade bands by a single chain operator, subject to manufacturer's design criteria.
- F. Multiple Shade Radial Band: Provide shade hardware system that allows multi-banded manually operated shades capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degree total offset.
- G. Intermediate Brackets: UHMW plastic twist-locks into carrier bracket, allowing continuous roller operation with multiple shades.
- H. Access and Material Requirements:
  - 1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from window opening and without requiring end and center supports to be removed.
  - 2. Provide shade hardware that allows for removal and re-mounting of the shade bands without removal of shade tube, drive or operating support brackets.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Install window shade systems in accordance with manufacturer's instructions and these specifications.
- B. Assume responsibility for all field dimensions and mounting surfaces.
- C. Adjust window shade systems for proper operation.

#### **1.02 CLEANING**

- A. See Section 01 19 13 – Process Cleaning.
- B. Remove and recycle excess material & packaging as required. See Section 01 74 19 – Construction Waste Management and Disposal.

**END OF SECTION 12 24 13**

**SECTION 12 32 16****PLASTIC-LAMINATE-CLAD CASEWORK****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Plastic-laminate-faced wood cabinets.

**1.02 RELATED SECTIONS**

- A. Section 06 10 00 – Rough Carpentry
- B. Section 06 41 19 – Countertops
- C. Section 09 21 16 - Gypsum Board Assemblies; for reinforcements in gypsum board partitions for anchoring casework.

**1.03 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for casework. Include plans, elevations, sections, details, and attachments to other Work.
- C. Samples: For cabinet finishes and for each type of top material indicated.
- D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative of casework manufacturer for installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain casework through single source and from single manufacturer.
- C. Quality Standard: Unless otherwise indicated, comply with Architectural Woodwork Institute (AWI) Quality Standards, Eighth Edition, Section 01 60 00.
  - 1. Provide AWI Quality Certification Program certificate indicating that casework complies with requirements.
- D. Fire-Test-Response Characteristics: Provide materials with the following fire-test-response characteristics as determined by UL, or Warnock Hersey testing, or other agency acceptable to authorities having jurisdiction.
  - 1. Surface-Burning Characteristics: Not exceeding values indicated below; in compliance with ASTM E 84.
    - a. Flame Spread: 200, maximum.
    - b. Smoke Developed: 450, maximum.
- E. All wood products designated as "FSC certified" in this specification shall be certified according to the rules of the Forest Stewardship Council ([www.fscus.org](http://www.fscus.org)).

### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver casework only after painting, utility roughing-in, wet-work is completed, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period. All operations that could damage, soil, or deteriorate casework have been completed in installation areas.
- A. Protect surfaces during handling and installation.

### 1.06 PROJECT CONDITIONS

- A. Field Measurements: Where casework is indicated to fit to other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.

### 1.07 COORDINATION

- A. Coordinate layout and installation of metal framing and reinforcements in gypsum board assemblies for support of casework.

### 1.08 WARRANTY

- A. Manufacturer's warranty to repair or replace components of casework that fail in materials or workmanship within five years from date of Substantial Completion.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Plastic-Laminate Faced Casework:
  - 1. Strata Design
  - 2. Britton Woodworks
  - 3. Mastercraft
  - 4. Thomas & Milliken
  - 5. Cabinets by Robert
  - 6. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 MATERIALS

- A. Wood-based Components:
  - 1. Wood fabricated from old growth timber is not permitted.
  - 2. Certification: Forest Stewardship Council (FSC) Certified.
  - 3. Composite wood and agrifiber products shall contain no added urea-formaldehyde resins.
- B. Adhesives: Type recommended by fabricator to suit application. Low VOC, low odor, solvent-free, water-based contact adhesives meeting the requirements set forth in the applicable LEED Reference Guide. See the applicable LEED Reference Guide for the most current VOC limits for adhesives, paints, and coatings.
- C. Maximum Moisture Content for Lumber: 7% for hardwood and 12% for softwood.
- D. Particleboard: ANSI A208.1, Grade M-3, minimum 47 lb/cu. ft. density.
- E. Medium-Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.

- F. Hardboard: AHA A135.4, Class 1 Tempered.
- G. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.
  - 1. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3 Grade HGS, 0.048 inch nominal thickness.
    - a. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E 84.
    - b. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
    - c. Finish: Matte or suede, gloss rating of 5 to 20.
    - d. Surface Color and Pattern: As selected by architect from manufacturer's full range.
    - e. Manufacturers:
      - 1) Formica Corporation: [www.formica.com](http://www.formica.com).
      - 2) Nevamar Company: [www.nevamar.com](http://www.nevamar.com).
      - 3) Panolam Industries: [www.pionitelaminates.com](http://www.pionitelaminates.com).
      - 4) Wilsonart International, Inc: [www.wilsonart.com](http://www.wilsonart.com).
      - 5) Substitutions: See Section 01 60 00 - Product Requirements.
  - 2. Fabricate in accordance with AWI/AWMAC Quality Standards Illustrated Custom Grade
- H. Edgebanding: Same material as top, on front surface of countertop, on front edge of shelving, on top of back splashes, and ends of splashes.
- I. Design: Full Overlay.
- J. Color, Patterns, and Finishes:
  - 1. Melamine-Faced: As selected by the Architect from the manufacturer's full range of color, finishes, and patterns.
  - 2. Plastic-Laminate Faced: As selected by the Architect from the manufacturer's full range of color, finishes, and patterns.

## 2.03 COMPONENTS

- A. Exposed Cabinet:
  - 1. Plastic Laminate: Type VGS.
    - a. Unless otherwise indicated, provide plastic laminate for exposed surfaces.
- B. Semi-exposed Cabinet:
  - 1. Plastic Laminate: Type CLS 0.020-inch thick.
    - a. Provide plastic laminate for interior faces of doors and drawer fronts, where required to balance exterior cabinet panel, and where indicated.
  - 2. Melamine-Faced Particleboard: Particleboard with decorative surface of thermally fused, melamine-impregnated web and complying with LMA SAT-1.
    - a. Provide melamine-faced particleboard for semiexposed surfaces, unless otherwise indicated.
- C. Concealed Cabinet:
  - 1. Solid Wood: Any hardwood or softwood species, without defects affecting strength or utility.
  - 2. Plastic Laminate: Type BKL.

## 2.04 CABINET FABRICATION

- A. Shop-cut openings for hardware, appliances, plumbing fixtures, and similar items to greatest extent possible. Locate openings accurately using templates or rough in diagrams. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges with a water-resistant coating.

- B. Plastic-Laminate-Faced Casework Construction:
1. Bottoms and Ends of Cabinets, Shelves, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch particleboard, plastic-laminate faced on exposed surfaces, melamine faced on semiexposed surfaces.
  2. Concealed Backs of Cabinets: Minimum 3/8-inch particleboard, melamine faced. Back shall be inset from rear of body and fully dadoed on all four sides. Provide stiffeners fastened to back and body. Back perimeter shall be toe-nailed with mechanical fasteners.
  3. Base Cabinet Top: 3/4-inch melamine face particleboard solid from front to back. Front and rear spreaders are not acceptable.
  4. Structural Cabinet Support: Cabinet sub-base shall be separate and continuous 4-inch high ladder-type platform design leveled and floor mounted prior to cabinet body placement. Material shall be exterior grade plywood. Provide 2 1/2 inch recess at front of cabinet and 3/8 inch recess at exposed ends. No cabinet sides to floor will be allowed.
  5. Interior Structure: All cabinets 36 inches and wider shall have mechanically fastened and removable vertical divider to reduce horizontal shelf deflection. If these are not mechanically fastened, all shelves, tops, and bottoms shall be 1 inch thick with fixed intermediate support. Wall cabinets shall have minimum clear inside depth of 12 inches unless indicated otherwise.
  6. Shelf Loading: Shelves shall meet the loading and deflection standards of the National Particleboard Association.
  7. Door and Drawer Front Rail: Minimum 3/4 inch by 6 inch by full horizontal width of cabinet body rails immediately behind joints between any combination of doors or drawers.
    - a. a. Edge Banding: Rigid PVC extrusions, through color with satin finish, 3 mm thick.
  8. Drawer Fronts: 3/4 inch particleboard, plastic-laminate faced on both sides.
  9. Drawer Sides and Backs: 1/2 inch melamine-faced particleboard, with glued dovetail or multiple-dowel joints.
  10. Drawer Bottoms: 1/2 inch melamine-faced particleboard glued and dadoed into front, back, and sides of drawers with 1/2 inch recess. Provide half inch by half inch mechanically fastened under body stiffeners from front to back of drawer for drawer widths as follows:
    - a. a. 24 inches to 35 inches: One required.
    - b. b. 36 inches to 47 inches: Two required.
    - c. c. 48 inches or more: Three required.
  11. Doors: 3/4 inch particleboard or medium-density fiberboard, plastic-laminate faced on both sides.
- C. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets.

## 2.05 HARDWARE

- A. Provide manufacturer's standard powder-coated, commercial-quality, heavy-duty hardware complying with requirements indicated.
1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.
  2. Exposed Metal Finish: Satin chrome plated BHMA 626 for brass or bronze base, BHMA 652 for steel base, and BHMA 630 for satin stainless steel.
- B. Concealed Hinges: Steel concealed, full overlay hinges complying with BHMA A156.9, Grade 1. Provide 2 hinges for doors less than 48 inches high and 3 hinges for doors more than 48 inches high.

- C. Pulls: Solid aluminum, stainless-steel, or chrome-plated brass wire pulls, fastened from back with two screws. For sliding doors, provide recessed stainless-steel or chrome-plated flush-pulls. Provide 2 pulls for drawers more than 24 inches wide.
- D. Door Catches: Powder-coated, dual, self-aligning, permanent magnet catch. Provide 2 catches on doors more than 48 inches high.
- E. Drawer Slides: Powder-coated, metal-channel, self-closing drawer slides, with positive out stop, in stop, and outkeeper, designed to prevent rebound when drawers are closed, with nylon-tired, ball-bearing rollers, and complying with BHMA A156.9, Type B05091, and rated for the following dynamic loads:
  - 1. Box Drawer Slides: 100 lbf rated for 50,000 cycles.
  - 2. File Drawer Slides: 150 lbf full extension.
  - 3. Pencil Drawer Slides: 45 lbf.
  - 4. Keyboard Slide: 75 lbf.
  - 5. Trash Bin Slides: 150 lbf.
  - 6. Paper Storage Drawers: 3 part progressive opening slide 100 lbf.
- F. Label Holders: Stainless steel or chrome plated, sized to receive standard label cards approximately 1 by 2 inches, attached with screws or brads.
  - 1. Provide where indicated.
- G. Drawer and Cupboard Locks: Cylindrical (cam) type, 5-pin tumbler, brass with chrome-plated finish, complying with BHMA A156.11, Grade 1.
  - 1. Provide a minimum of two keys per lock and six master keys.
  - 2. Provide locks where indicated.
  - 3. Provide spring loaded elbow catch and strike plate behind none-locking door, polished nickel finish.
- H. Sliding-Door Hardware Sets: Manufacturer's standard, to suit type and size of sliding-door units.
- I. Adjustable Shelf Supports: 2 pin locking plastic shelf rests complying with BHMA A156.9, Type B04013. Load rating shall be minimum 300 lb per support.
- J. Grommets for Cable Passage: Nominal 2 inch outside diameter molded plastic grommets with nominal 1 3/4 inch hole and plastic cap with slot for wire passage.

## 2.06 COUNTERTOPS

- A. See Section 06 41 19.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of institutional casework.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION OF CASEWORK

- A. Install plumb, level, and true; shim as required, using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

- B. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within 1/16 inch of a single plane. Fasten cabinets to partition framing, wood blocking, or reinforcements in partitions with fasteners spaced 24 inches o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch.
  - 1. Where base cabinets are not installed adjacent to walls, fasten to floor at toe space with fasteners spaced 24 inches o.c. Secure sides of cabinets to floor, where they do not adjoin other cabinets, with not less than two fasteners.
- C. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within 1/16 inch of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Align similar adjoining doors to a tolerance of 1/16 inch.
  - 1. Fasten through back, near top and bottom, at ends, and not more than 16 inches o.c. with fasteners appropriate for substrate.
- D. Install hardware uniformly and precisely. Set hinges snug and flat in mortises, unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
- E. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

### 3.03 CLEANING AND PROTECTING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- C. Protection: Provide 6 mil plastic or other suitable water-resistant covering over countertop surfaces. Tape to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

**END OF SECTION 12 32 16**