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**CIVIL**

Refer to Specifications on Drawings.

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Refer to Specifications on Drawings.

**PLUMBING**

Refer to Specifications on Drawings.

**ELECTRICAL**

Refer to Specifications on Drawings.

**TELECOMMUNICATION**

Refer to Specifications on Drawings.

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## BID OFFER FORM

Bid # 21-45 Haskell Security Vestibule Addition

BID SUBMITTED BY: \_\_\_\_\_

Date \_\_\_\_\_

The undersigned, having become familiar with the local conditions affecting cost of work and with the Bidding Documents, including the advertisement of the Invitation for Bid, the Instructions and Supplementary Instructions to Bidders, this Bid Offer Form, the General and Supplementary Conditions, the Drawings and Specifications, and Addenda issued thereto, as prepared and issued by the Board of Education of Rockford School District No. 205, Winnebago and Boone Counties, Illinois hereby agrees to furnish all labor, material and equipment necessary to do the Work required for the project and IFB identified above, for the amount shown below:

**Note: Contractor to write "No Bid" in the dollar amount section for any line items not bid.**

**BASE BID:** Addition and Renovations Work to Haskell Elementary School

TOTAL: \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_ )

**UNIT PRICES** Should the net result of change for any of the following categories of work require more or less quantity of work than originally indicated in the Drawings and/or Specifications, the price for such added or deducted work will be as follows:

Provide moisture mitigation for existing concrete slabs receiving carpet.....\$ \_\_\_\_\_ Per SF

Provide moisture mitigation for new concrete slabs receiving carpet.....\$ \_\_\_\_\_ Per SF

### **ADDENDA RECEIVED**

The undersigned acknowledges receipt of Addenda \_\_\_\_ to \_\_\_\_ inclusive.

### **PRE-BID MEETING ATTENDANCE**

A Bidder representative attended the Pre-Bid Meeting? YES \_\_\_\_\_ or NO \_\_\_\_\_.

### **SITE VISIT**

Existing premises and conditions were checked by an on-site inspection on \_\_\_\_\_.

### **CONTRACTOR'S QUALIFICATION STATEMENT**

A fully completed AIA Document A305-1986 Contractor's Qualification Statement is **required** AND MUST BE SUBMITTED WITH THE BID. Include at least three references from projects completed in the past five (5) years with phone number, date of completion, description of work, and project architect (or engineer) contact name with phone number. Projects must be similar to the scope of this bid, and the bidder must have acted in the capacity of prime or general contractor.

Contractor has adequate equipment to perform the work properly and expeditiously: \_\_\_\_Yes \_\_\_\_No.

## BID OFFER FORM

### **COMMENCEMENT AND COMPLETION OF CONTRACT**

The undersigned agrees, if awarded the Contract, to commence the contract work within five (5) days of receipt of Order to Proceed or if required, upon execution of a formal written contract and to complete said Work within the specified completion time. The undersigned further agrees to execute the Contract, furnish satisfactory performance and payment bond as well as insurance coverage, as specified in strict accordance with the Contract Documents.

### **START AND COMPLETION DATES PHASE ONE**

Date of Commencement of Construction: July 1, 2021  
Date of Substantial Completion: August 20, 2021  
Date of Final Completion: August 27, 2021

### **START AND COMPLETION DATES PHASE TWO**

Date of Commencement of Construction: July 1, 2021  
Date of Substantial Completion: November 10, 2021  
Date of Final Completion: November 20, 2021

BIDDER: \_\_\_\_\_  
(Corporation) (Partnership) (Individual) Circle One

Address \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone No. \_\_\_\_\_ Email address \_\_\_\_\_

BIDDER FEIN/SSN NO. \_\_\_\_\_

By: \_\_\_\_\_  
Bidder or Authorized Agent Signature \_\_\_\_\_ Print name \_\_\_\_\_

Title: \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public  
My commission expires: \_\_\_\_\_

BID OFFER FORM

**BID DEPOSIT CERTIFICATION**

A Bid Deposit is required in the amount of 5% of the total Bid including Alternate Bids. This Bid Deposit is to be a Bid Bond, Bank Draft or Certified Check made payable to the “Rockford School District No. 205”, as a guarantee that if awarded all or part of the Bid, the firm will enter into a contract to perform with the Board of Education.

Amount of Total Bid \$ \_\_\_\_\_

Amount of Bank draft or Certified Check \$ \_\_\_\_\_

BIDDER: \_\_\_\_\_

\_\_\_\_\_  
Signature of Bidder or Authorized Agent

**SUBCONTRACTOR LISTING**

1. Pursuant to bidding requirements for the Work:  
The Bidder, for portions of the Work equaling or exceeding 1/2 of 1% of the total Contract Sum, proposes to use the following Subcontractors. The Bidder proposes to perform all other portions of the Work with its own forces. The District reserves the right to qualify all Subcontractors. COPY AND ATTACH ADDITIONAL SHEETS AS NECESSARY.

2. <u>Portion of the Work</u>	<u>Subcontractor Name and Address</u>
_____	_____
	_____
	_____
_____	_____
	_____
	_____
_____	_____
	_____
	_____

BID OFFER FORM

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Bidder:

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By: 

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 Bidder or Authorized Agent Signature

-END OF BID OFFER FORM-

**DIVISION 01 – GENERAL REQUIREMENTS**

**SECTION 011000**  
**SUMMARY**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Work under separate contracts.
- 4. Access to site.
- 5. Coordination with occupants.
- 6. Work restrictions.
- 7. Specification and drawing conventions.
- 8. Miscellaneous provisions.

- B. Related Requirements:

- 1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

**1.3 PROJECT INFORMATION**

- A. Project Identification: Addition and Renovations to Haskell Elementary School.

- 1. Haskell Elementary School: 515 Maple Street, Rockford, IL 61103.

- B. Owner: Board of Education of Rockford School District No. 205, 501 Seventh Street, Rockford, Illinois 61104.

- C. Architect: Richard L Johnson Associates, Inc., 4703 Charles Street, Rockford, IL 61108.

**1.4 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The Work of the Project is defined by the Contract Documents and consists of Additions and Renovations.

- 1. A separate contract will be awarded for Asbestos Abatement work outside of this project.

- B. Contractor is responsible for construction means, methods and sequencing. Architect will not have control over, be in charge of, or be responsible for construction means, methods, techniques, sequences, procedures or safety precautions and programs in connection with the Work, as these are solely within the responsibility of the Contractor. Architect shall not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

#### 1.5 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Concurrent Work: Owner will award a separate contract for the following construction operations at the project site. Those operations will be conducted simultaneously with work under the contract.
  - 1. An Environmental Demolition Contractor (Asbestos Abatement) will be removing existing pipe elbow insulation above existing ceilings. Abatement work will be complete prior to this construction phase of this project.

#### 1.6 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
  - 1. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

#### 1.7 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. 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. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or



used facilities without written permission from Owner and authorities having jurisdiction.

2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

## 1.8 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Normal business working hours will be 7:00 a.m. to 3:30 p.m., Monday through Friday. However, Contractor can work weekends and nights with prior notification to the Owner.
- C. 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.
  1. Notify Architect and Owner not less than two days in advance of proposed disruptive operations.
- D. Nonsmoking Building: Smoking is not permitted within the building or anywhere on the site.
- E. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

## 1.9 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
  1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 012500**  
**SUBSTITUTION PROCEDURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
  - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

**1.3 DEFINITIONS**

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
  - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

**1.4 ACTION SUBMITTALS**

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Provide on Contractor's letterhead.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

- c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
  - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. Certificates and qualification data, where applicable or requested.
  - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

## 1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Substitution request is fully documented and properly submitted.
    - c. Requested substitution will not adversely affect Contractor's construction schedule.
    - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - e. Requested substitution is compatible with other portions of the Work.
    - f. Requested substitution has been coordinated with other portions of the Work.
    - g. Requested substitution provides specified warranty.
    - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

## PART 3 - EXECUTION (Not Used)

END OF SECTION 012500



**SECTION 012600**

**CONTRACT MODIFICATION PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue through Owner supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in Proposal Request or 10 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include costs of labor and supervision directly attributable to the change.
  - 5. Include an updated Contractor's construction schedule.

## 1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.
- B. The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:
  - 1. For the Contractor, for Work performed by the Contractor's own forces, twelve percent of the cost.
  - 2. For the Contractor, for Work performed by the Subcontractor's, five percent of the amount due the Subcontractors.
  - 3. For each Subcontractor involved, for Work performed by the Subcontractor's own forces, five percent of the cost.
  - 4. For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, five percent of the amount due the Sub-subcontractor.
  - 5. In order to facilitate checking of quotations for extras and credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also.

## 1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Work Change Directive: Architect may issue a Construction Work Change Directive on AIA Document G714 Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.



- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

END OF SECTION 012600



**DIVISION 01 – GENERAL REQUIREMENTS**

**SECTION 012900**  
**PAYMENT PROCEDURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
  - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

**1.3 DEFINITIONS**

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

**1.4 SCHEDULE OF VALUES**

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
  - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with continuation sheets.
    - b. Submittal schedule.
    - c. Items required to be indicated as separate activities in Contractor's construction schedule.
  - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.

- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:
  - a. Project name and location.
  - b. Name of Architect.
  - c. Architect's project number.
  - d. Contractor's name and address.
  - e. Date of submittal.
2. Arrange schedule of values consistent with format of AIA Document G703.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
  - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
6. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
7. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the 10<sup>th</sup> of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect and/or Project Manager will return incomplete applications without action.
  - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  - 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect or Program Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
  - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  - 2. When an application shows completion of an item, submit conditional final or full waivers.
  - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  - 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of values.
  - 3. Contractor's construction schedule (preliminary if not final).
  - 4. Submittal schedule (preliminary if not final).
  - 5. List of Contractor's staff assignments.
  - 6. List of Contractor's principal consultants.
  - 7. Copies of building permits.
  - 8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  - 9. Initial progress report.
  - 10. Certificates of insurance and insurance policies.
  - 11. Performance and payment bonds.

- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
  - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  - 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  - 1. Evidence of completion of Project closeout requirements.
  - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  - 3. Updated final statement, accounting for final changes to the Contract Sum.
  - 4. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
  - 5. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
  - 6. AIA Document G707-1994, "Consent of Surety to Final Payment."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

**SECTION 013100**

**PROJECT MANAGEMENT & COORDINATION**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination drawings.
  - 2. Requests for Information (RFIs).
  - 3. Project meetings.
- B. Related Requirements:
  - 1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
  - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
  - 2. Number and title of related Specification Section(s) covered by subcontract.
  - 3. Drawing number and detail references, as appropriate, covered by subcontract.

## 1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Preinstallation conferences.
  - 7. Project closeout activities.
  - 8. Startup and adjustment of systems.

## 1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
  - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.



## 1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
  - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
  - 1. Project name.
  - 2. Project number.
  - 3. Date.
  - 4. Name of Contractor.
  - 5. Name of Architect.
  - 6. RFI number, numbered sequentially.
  - 7. RFI subject.
  - 8. Specification Section number and title and related paragraphs, as appropriate.
  - 9. Drawing number and detail references, as appropriate.
  - 10. Field dimensions and conditions, as appropriate.
  - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  - 12. Contractor's signature.
  - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: AIA Document G716.
  - 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
  - 1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.
    - f. Requests for interpretation of Architect's actions on submittals.
    - g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

## 1.8 PROJECT MEETINGS

- A. General Contractor: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
  1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect.
  1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Lines of communications.
    - f. Procedures for processing field decisions and Change Orders.
    - g. Procedures for RFIs.
    - h. Procedures for testing and inspecting.
    - i. Procedures for processing Applications for Payment.
    - j. Distribution of the Contract Documents.
    - k. Submittal procedures.
    - l. Preparation of record documents.
    - m. Use of the premises and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.
    - q. Responsibility for temporary facilities and controls.
    - r. Procedures for moisture and mold control.
    - s. Procedures for disruptions and shutdowns.
    - t. Construction waste management and recycling.
    - u. Parking availability.

- v. Office, work, and storage areas.
- w. Equipment deliveries and priorities.
- x. First aid.
- y. Security.
- z. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Progress Meetings: General Contractor to conduct progress meetings at weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - 1) Review schedule for next period.
  - b. Review present and future needs of each entity present, including the following:
    - 1) Interface requirements.
    - 2) Sequence of operations.
    - 3) Status of submittals.
    - 4) Deliveries.
    - 5) Off-site fabrication.
    - 6) Access.
    - 7) Site utilization.
    - 8) Temporary facilities and controls.
    - 9) Progress cleaning.
    - 10) Quality and work standards.
    - 11) Status of correction of deficient items.
    - 12) Field observations.
    - 13) Status of RFIs.
    - 14) Status of proposal requests.
    - 15) Pending changes.
    - 16) Status of Change Orders.
    - 17) Pending claims and disputes.
    - 18) Documentation of information for payment requests.

4. Minutes: The Architect will be responsible for conducting the meeting and will record and distribute the meeting minutes to each party present and to parties requiring information.
  - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

**DIVISION 01 – GENERAL REQUIREMENTS**

**SECTION 013300**  
**SUBMITTAL PROCEDURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
  - 2. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

**1.3 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

**1.4 ACTION SUBMITTALS**

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

## 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  - 1. Initial Review: Allow 5 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- C. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
  - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
  - 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  - 3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Name of subcontractor.
    - f. Name of supplier.
    - g. Name of manufacturer.
    - h. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - i. Number and title of appropriate Specification Section.
    - j. Drawing number and detail references, as appropriate.
    - k. Location(s) where product is to be installed, as appropriate.
    - l. Other necessary identification.

4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
  - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return without review submittals received from sources other than Contractor.
  - a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
    - 1) Project name.
    - 2) Date.
    - 3) Destination (To:).
    - 4) Source (From:).
    - 5) Name and address of Architect.
    - 6) Name of Contractor.
    - 7) Name of firm or entity that prepared submittal.
    - 8) Names of subcontractor, manufacturer, and supplier.
    - 9) Category and type of submittal.
    - 10) Submittal purpose and description.
    - 11) Specification Section number and title.
    - 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
    - 13) Drawing number and detail references, as appropriate.
    - 14) Indication of full or partial submittal.
    - 15) Transmittal number, numbered consecutively.
    - 16) Submittal and transmittal distribution record.
    - 17) Remarks.
    - 18) Signature of transmitter.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

#### A. General Submittal Procedure Requirements:

1. Submit electronic submittals via email as PDF electronic files.
  - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
  3. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
  4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. Submit Product Data before or concurrent with Samples.
  5. Submit Product Data in the following format:
    - a. PDF electronic file.
    - b. Three paper copies of Product Data unless otherwise indicated. Architect will return two copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.



2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
  3. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
    - b. Two opaque (bond) copies of each submittal. Architect will return one copy.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
    - e. Specification paragraph number and generic name of each item.
  3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
  4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
    - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
    - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  - 1. Submit product schedule in the following format:
    - a. PDF electronic file.
    - b. Three paper copies of product schedule or list unless otherwise indicated. Architect will return two copies.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- J. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- K. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- L. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- M. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- N. Schedule of Test and Inspections: Comply with requirements specified in Section 014000 "Quality Requirements".
- O. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Contractor's Review Stamp: review each submittal with a uniform, review stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

### 3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's review stamp and will return them without action.
- B. Action Submittals: Architect's review is performed to determine general conformance with the design concept set forth in the Contract Documents. Review does not relieve Contractor of sole responsibility for means, methods, sequencing, scheduling of work, verification of quantities and dimensions or the performance of the work in a safe manner. No comments on the shop drawings will relieve the Contractor from performing the work in a manner consistent with the Contract Documents. Architect's review will indicate action mark as follows:
  - 1. Reviewed.
  - 2. Note Comments.
  - 3. Rejected.
  - 4. Not reviewed/Outside scope of Services.
  - 5. Resubmit After Required General Contractor Review.
  - 6. Revise.
  - 7. Resubmit.
- C. Subcontractors are not to use shop drawings and submittals to ask questions or request information. All questions must be asked through the RFI.
- D. Architect is not responsible for correcting errors in the shop drawings or submittals.
- E. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- F. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- G. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300



**SECTION 014200**  
**REFERENCES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: 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 Architect. Other terms including "requested," "authorized," "selected," "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": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- 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 on which Project is to be built.

### 1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in the following list:
  - 1. AA – Aluminum Association (The).
  - 2. AIA - American Institute of Architects (The); [www.aia.org](http://www.aia.org).
  - 3. AISC - American Institute of Steel Construction; [www.aisc.org](http://www.aisc.org).
  - 4. AISI - American Iron and Steel Institute; [www.steel.org](http://www.steel.org).
  - 5. ANSI - American National Standards Institute; [www.ansi.org](http://www.ansi.org).
  - 6. ASTM - ASTM International; [www.astm.org](http://www.astm.org).
  - 7. AWP - American Wood Protection Association; [www.awpa.com](http://www.awpa.com).
  - 8. CSI - Construction Specifications Institute (The); [www.csinet.org](http://www.csinet.org).
  - 9. DASMA - Door and Access Systems Manufacturers Association; [www.dasma.com](http://www.dasma.com).
  - 10. DHI - Door and Hardware Institute; [www.dhi.org](http://www.dhi.org).
  - 11. GANA - Glass Association of North America; [www.glasswebsite.com](http://www.glasswebsite.com).
  - 12. ICBO - International Conference of Building Officials; (See ICC).
  - 13. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
  - 14. IGMA - Insulating Glass Manufacturers Alliance; [www.igmaonline.org](http://www.igmaonline.org).
  - 15. NFPA - National Fire Protection Association; [www.nfpa.org](http://www.nfpa.org).
  - 16. NFPA - NFPA International; (See NFPA).
  - 17. NFRC - National Fenestration Rating Council; [www.nfrc.org](http://www.nfrc.org).
  - 18. NOMMA - National Ornamental & Miscellaneous Metals Association; [www.nomma.org](http://www.nomma.org).
  - 19. SPIB - Southern Pine Inspection Bureau; [www.spib.org](http://www.spib.org).
  - 20. UL - Underwriters Laboratories Inc.; [www.ul.com](http://www.ul.com).
  - 21. WCMA - Window Covering Manufacturers Association; [www.wcmanet.org](http://www.wcmanet.org).
  - 22. WDMA - Window & Door Manufacturers Association; [www.wdma.com](http://www.wdma.com).
  - 23. WWPA - Western Wood Products Association; [www.wwpa.org](http://www.wwpa.org).

- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
  2. ICC-ES - ICC Evaluation Service, LLC; [www.icc-es.org](http://www.icc-es.org).
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
1. CPSC - Consumer Product Safety Commission; [www.cpsc.gov](http://www.cpsc.gov).
  2. DOC - Department of Commerce; National Institute of Standards and Technology; [www.nist.gov](http://www.nist.gov).
  3. DOE - Department of Energy; [www.energy.gov](http://www.energy.gov).
  4. EPA - Environmental Protection Agency; [www.epa.gov](http://www.epa.gov).
  5. FG - Federal Government Publications; [www.gpo.gov](http://www.gpo.gov).
  6. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; [www.eetd.lbl.gov](http://www.eetd.lbl.gov).
  7. OSHA - Occupational Safety & Health Administration; [www.osha.gov](http://www.osha.gov).
- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. FED-STD - Federal Standard; (See FS).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200





**DIVISION 01 – GENERAL REQUIREMENTS**

**SECTION 015000**

**TEMPORARY FACILITIES & CONTROLS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

**1.3 USE CHARGES**

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
  - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
  - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. None.

### 2.2 TEMPORARY FACILITIES

- A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  - 1. Store combustible materials apart from building.

### 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
  - 1. Provide sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
- B. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- C. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

- D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- E. Temporary Elevator Use if Available: Use of existing elevators is permitted.
- F. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
  - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- C. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

END OF SECTION 015000



**DIVISION 01 – GENERAL REQUIREMENTS**

**SECTION 016000**  
**PRODUCT REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
  - 1. Section 014200 "References" for applicable industry standards for products specified.

**1.3 DEFINITIONS**

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

#### 1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
  - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
    - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
    - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

#### 1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

#### 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
  - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
  - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.



- C. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
  - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  - 3. Evidence that proposed product provides specified warranty.
  - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
  - 5. Samples, if requested.

## PART 3 - EXECUTION (Not Used)

END OF SECTION 016000



**SECTION 017300**  
**EXECUTION**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Cutting and patching.
  - 5. Coordination of Owner-installed products.
  - 6. Progress cleaning and final cleaning.
  - 7. Starting and adjusting.
  - 8. Protection of installed construction.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for limits on use of Project site.
  - 2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
  - a. Refer to Unit Specifications.
2. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  1. Examine walls for suitable conditions where products and systems are to be installed.
  2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Proceed with patching after construction operations requiring cutting are complete.

- F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
  3. Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.6 PROGRESS AND FINAL CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  3. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
  4. Contractor shall provide final cleaning of all new glass and aluminum window frames.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- K. Provide final cleaning of all disturbed areas. Clean all glass and frames.

### 3.7 STARTING AND ADJUSTING

- A. Confirm proper operation of components. Remove malfunctioning units, replace with new units and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

### 3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

END OF SECTION 017300



**SECTION 017419**

**CONSTRUCTION WASTE MANAGEMENT & DISPOSAL**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Disposing of nonhazardous construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
  - 2. Provide plywood under the wheels of the dumpsters.

- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

### 3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 017419

**DIVISION 01 – GENERAL REQUIREMENTS**

**SECTION 017700**  
**CLOSEOUT PROCEDURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Section 017300 "Execution" for progress cleaning of Project site.
  - 2. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

**1.4 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

**1.5 MAINTENANCE MATERIAL SUBMITTALS**

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

## 1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
  - 5. Submit test/adjust/balance records.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Advise Owner of pending insurance changeover requirements.
  - 2. Perform preventive maintenance on equipment used prior to Substantial Completion.
  - 3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
  - 4. Participate with Owner in conducting inspection and walkthrough.
  - 5. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 6. Complete final cleaning requirements, including touchup painting.
  - 7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

#### 1.7 FINAL COMPLETION PROCEDURES

- A. Preliminary procedures: Before requesting final inspection for determining final completion, complete the following:
  1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
  2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### 1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Submit list of incomplete items in the following format:
    - a. MS Excel electronic file. Architect, will return annotated file.
    - b. Three paper copies. Architect will return two copies.

## 1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
  - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
  - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

## 1.10 ELECTRONIC CLOSEOUT DOCUMENTATION

- A. General: Provide a complete project Closeout Documentation Package in electronic format. This package shall include:
  - 1. Project Record Documents.
  - 2. Approved submittals.
  - 3. Operation and Maintenance Manuals.
  - 4. Warranties.
  - 5. Project Contact Directory.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - e. Remove debris and surface dust from limited access spaces.
    - f. Sweep concrete floors broom clean in unoccupied spaces.
    - g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - h. Clean transparent materials, including and in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish glass, taking care not to scratch surfaces.
    - i. Remove labels that are not permanent.
    - j. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

### 3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
  - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION 017700



DIVISION 01 – GENERAL REQUIREMENTS  
**SECTION 017839**  
**PROJECT RECORD DOCUMENTS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. Related Requirements:
  - 1. Section 017300 "Execution" for final property survey.
  - 2. Section 017700 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set of marked-up record prints.
  - 2. Number of Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit one paper-copy set(s) of marked-up record prints.
      - 2) Submit PDF electronic files of scanned record prints and one of file prints.
      - 3) Submit record digital data files and one set of plots.
      - 4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit three paper-copy sets of marked-up record prints.
      - 2) Submit PDF electronic files of scanned record prints and three sets of prints.
      - 3) Print each drawing, whether or not changes and additional information were recorded.

- B. Record Specifications: Submit one paper copy and PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy and PDF electronic files and directories of each submittal.
  - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
  - 2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  - 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  - 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
  - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  - 2. Format: Annotated PDF electronic file with comment function enabled.
  - 3. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  - 4. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file and paper copy.

# PART 3 - EXECUTION

## 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839



## **DIVISION 1 – GENERAL REQUIREMENTS**

### **SECTION 024119** **SELECTIVE DEMOLITION**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

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

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Demolition and removal of selected portions of building or structure.
  - 2. Demolition and removal of selected site elements.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
  - 2. Section 017300 "Execution" for cutting and patching procedures.

##### **1.3 DEFINITIONS**

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse or store as instructed by Architect.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

##### **1.4 MATERIALS OWNERSHIP**

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

## 1.5 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials:
  - 1. Hazardous materials will be removed by Owner before start of the Work.
  - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  - 1. Maintain fire-protection facilities in service during selective demolition operations.

## 1.6 COORDINATION

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

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

- C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
  - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

### 3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 3. Cover and protect furniture, furnishings, and equipment that have not been removed.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

### 3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  5. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
  6. Maintain adequate ventilation when using cutting torches.
  7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  10. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items (When requested by Architect):
1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area on-site designated by Owner.
  5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items(When requested by Architect):
1. Clean and repair items to functional condition adequate for intended reuse.
  2. Remove existing brick, clean and store and install where needed as designated on drawings.
  3. Pack or crate items after cleaning and repairing. Identify contents of containers.
  4. Protect items from damage during transport and storage.
  5. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, cleaned and reinstalled in their original locations after selective demolition operations are complete.



### 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

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

### 3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them according to Section 017419 "Construction Waste Management and Disposal."
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
  - 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

### 3.7 CLEANING

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

END OF SECTION 024119



DIVISION 03 – CONCRETE  
**SECTION 033000**  
**CAST-IN-PLACE CONCRETE**

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. Cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, insulation and finishes.
  - 2. Cast-in-place concrete stoops, foundations walls, footings and walks.
  - 3. Perimeter rigid insulation
  - 4. Hand rub all exposed concrete foundation walls.
- B. Related Requirements:
  - 1. Section 096813 "Carpet Tile"
  - 2. Section 312000 "Earthwork" for drainage fill under interior slabs-on-grade.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 SUBMITTALS

- A. Process all submittals per requirements in Section 013300 – Submittal Procedures.
- B. Shop Drawings: Submit Shop Drawings pertaining to fabrication, bending and placement of concrete reinforcements.
  - 1. Comply with the ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures."
  - 2. Show bar schedules, diagrams of bent bars, and arrangements of concrete reinforcement. Include special reinforcement required at openings through concrete structures.
- C. Test Reports: Submit 3 copies of laboratory test reports for concrete materials and mix design tests including potential for alkali-silica reaction (ASR).

- D. Product Data: Submit manufacturer's data on fiber reinforcement, additives, curing agents, sealers, grouts, joint materials and similar pre-manufactured products.
- E. Certificates: Submit purchase receipt verifying grade and quantity of under-slab vapor barrier.
- F. Concrete Truck Delivery Tickets: Submit delivery tickets indicating:
  - 1. Delivery date and time dispatched.
  - 2. Name and location of project.
  - 3. Name of Contractor.
  - 4. Name of ready-mixed concrete producer.
  - 5. Truck number.
  - 6. Number of cubic yards of concrete in load.
  - 7. Class of concrete.
  - 8. Cement content in bags per cubic yard of concrete.
  - 9. Type and brand name of cement.
  - 10. Names and quantities of admixtures used.
  - 11. Maximum size of aggregate.
  - 12. Amount of water added at job, if any, and who authorized the addition.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- C. Cooperate with other trades regarding installation of embedded items. Obtain templates, dimension, instructions, etc., from other trades or other contractors as required for setting items in concrete work.
- D. The Owner shall employ a reputable testing laboratory to perform concrete inspections and tests as hereinafter specified. The costs for testing shall be paid for by the Owner, except as hereinafter specified under FIELD QUALITY CONTROL TESTS.
- E. Comply with the latest edition of each of the following:
  - 1. "Building Code Requirements for Reinforced Concrete" (ACI 318).
  - 2. "Specifications for Ready Mixed Concrete" (ASTM C 94).
  - 3. "Guide to Concrete Floor and Slab Construction" (ACI 302.1).
  - 4. "Recommended Practice for Hot Weather Concreting" (ACI 305).
  - 5. "Recommended Practice for Winter Concreting" (ACI 306).
  - 6. "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete" (ACI 304).
  - 7. "Specifications for Structural Concrete for Buildings" (ACI 301).
- F. Inform personnel that may be working with concrete as to requirements and the availability of ACI 301.

- G. Provide protection during the construction period for all floor slabs, from oil, grease, stains, discoloration and other physical damage.
- H. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

#### 1.7 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and as follows:
  - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### PART 2 - PRODUCTS

#### 2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301.
  - 2. ACI 117.

#### 2.2 FORM MATERIALS

- A. Form Facings for Unexposed Concrete: Plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

- B. Form Coatings: Commercial formulation intended for form coating which will not bond with, stain, or adversely affect concrete surfaces, and which will not impair bond or adhesion of subsequent treatments nor impede wetting of surfaces to be cured with water or curing compound.
- C. Form Ties:
  - 1. Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 2. Configured so as to leave no metal closer than 1" to the surface of the concrete.

## 2.3 STEEL REINFORCEMENT

- A. Materials
  - 1. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
  - 2. Tie Wire: Cold drawn steel wire meeting ASTM A 82.
  - 3. Welded Wire Fabric: Per ASTM A 185.
  - 4. Reinforcing Bar Holders: Galvanized or plastic coated when within 3/4" of exposed concrete surface.
- B. Fabrication:
  - 1. No lapped splices for tension and compression bars unless noted on the Drawings or approved. Locate splices in temperature bars so that no more than half the bars are spliced at any point. Lap splices 36 diameters.
  - 2. Label bars to identify grade of steel and to facilitate placing.
- C. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

## 2.4 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I for normal and Type III for high-early-strength.
- B. Mixing Water: Fresh, free of oil, acid, alkalis, salts, organic matter and potable.
- C. Aggregates: Per ASTM C 33, including freedom from potentially reactive constituents, as well as soft, thin elongated or laminated pieces, disintegrated stone, plant matter, trash and lumps of frozen or partly cemented material.
  - 1. ASR Tested: Per ASTM C 1260. Submit test results.
  - 2. Fine Aggregate: Natural hard, clean sand.
  - 3. Coarse Aggregate: Gravel or crushed rock.
    - a. Size 57 (1-1/2" top size) for structural elements 6" or more in thickness.
    - b. Size 67 (3/4" top size) for slabs.
  - 4. Furnish 3 copies of testing laboratory reports showing sieve analysis.

D. Admixtures:

1. Air-Entraining Admixture: Per ASTM C 260. Use one of the following:
  - a. "Darex AEA" by W.R. Grace.
  - b. "Sika AER" by Sika Chemical Corp.
  - c. "MB-VR" by Master Builders Co.
2. Water-Reducing Admixtures: Per ASTM C 494; one of the following:
  - a. "Pozzolith" by Master Builders Company.
  - b. "Plast-o-Crete" by Sika Chemical Co.
  - c. "WRDA" by W.R. Grace.
3. Calcium Chloride: Shall NOT be used. Neither calcium chloride nor admixtures containing chloride salts shall be added to concrete.

2.5 ACCESSORY MATERIALS

A. Rigid Perimeter Foundation Insulation: Closed cell extruded polystyrene foam board insulation 3" thick, complying with ASTM C 578, Type IV, in manufacturer's standard sizes.

1. Minimum R-value, per 1" thickness at 40°F: 5.7.
2. Minimum compressive strength: 25 psi.
3. Maximum water absorption: 0.15% by volume.

B. Vapor Barrier:

1. Black low-density polyethylene film 15 mils (.015") thick to maintain a permeance of less than .01 Perms and comply with ASTM E 1745 Class A.
  - a. "Stego Wrap (15 mil)" by Stego Industries.
  - b. "EcoShield E-15" by Epro Services.
  - c. "Iron Barr 15 mil" by FlatIron Films
  - d. "Viporcheck II 15 mil" by Vipor.
2. Joint and Sealing Tape: Moisture barrier manufacturer's recommended tape.

C. Curing Materials:

1. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., conforming to AASHTO M 182, Class 3.
2. Moisture-Retaining Cover: Waterproof paper, polyethylene film or polyethylene coated burlap conforming to ASTM C 171.
3. Curing Compound: Liquid, membrane forming compound conforming to ASTM C 309, Type 1, with fugitive dye, and guaranteed to not affect the bond, adhesion or effectiveness of floor hardeners or other applied finishes or surface treatments. Product shall be one of the following:

- a. "Masterseal" by Master Builder's Co.
  - b. "Kure-N-Seal" by Sonneborn.
  - c. "Sika-Gard C/H" by Sika Chemical Co.
  - d. "CS-309" by W.R. Meadows.
  - e. "Clearbond" by Guardian Chemical Co.
  - f. "Resi Chem Clear Cure" by Symons Corp.
- D. Dovetail Inserts: Sheet metal inserts conforming to ASTM A1008 and galvanized per ASTM A653 Class G60 (0.6oz/ft<sup>2</sup>):
- 1. "Dovetail Anchor Slots: Hot dipped galvanized steel sheet, not less than 0.0336 inch thick, with bent tab anchors. temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

## 2.6 PROPORTIONING AND DESIGN OF MIXES

- A. Use an independent testing facility experienced in concrete mix design and acceptable to Owner for preparation of proposed mix designs. The testing facility shall not be the same used for field quality control testing unless otherwise acceptable to Owner.
- B. Allow a minimum of 14 days prior to placing concrete for testing laboratory to design the mix for each type of concrete required.
- C. The adequacy of the design mix shall be verified by tests on a minimum of 6 cylinders; 3 tested at least 7 days and 3 at 28 days in accordance with ASTM C 192 and C 39 and by slump tests in accordance with ASTM C 143.
- D. Submit 3 copies of the mix design and test results to Owner's Representative for review before any concrete is placed.
- E. Concrete for exterior stoops and foundations shall have a maximum water-cement ratio of 5-1/4 gallons per bag and shall maintain a slump of 3". Incorporate an air entraining admixture yielding a total air content by volume of 4.5% to 7.5% for 3/4" top-sized aggregate and 4% to 7% for 1-1/2" top sized aggregate. Refer to drawings for compressive strength.
- F. Concrete for slabs and interior foundations shall have a maximum water-cement ratio of 6-1/2 gallons per bag and shall maintain a slump no greater than 4". Refer to drawings for compressive strength.
- G. Calcium chloride or admixtures containing chloride salts shall not be used.

## 2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Mix and transport in accordance with ASTM C 94, "Specification for Ready-Mixed Concrete" and the established mix design.
- B. Batch mixing at the site will not be allowed except on prior approval
- C. Use admixtures only as specified in the established mix design.



## PART 3 - EXECUTION

### 3.1 RIGID PERIMETER FOUNDATION INSULATION

- A. Apply insulation to the inside of exterior foundation walls, from under the floor slab down to the top of the footing. Apply under the floor slab from the exterior foundation wall to 2 feet under the slab.

### 3.2 VAPOR-RETARDER INSTALLATION

- A. Install vapor barrier directly under all interior concrete slabs on grade. Place barrier over the granular fill just before placement of the concrete; but do not place barrier until the granular fill has been inspected for compaction and grading per the requirements of Section 312000 - Earthwork for Building.
- B. Lap the membrane sheet edges at least 6", with the top placed in the direction of the spreading of the concrete, and seal each seam continuously with approved waterproof tape. Turn membrane up on to wall and seal with tape to wall.
- C. Seal all around pipes, conduits and other penetrations with tape.
- D. Apply tape only to dry surfaces cleaned of dirt and other contaminants.
- E. Just before membrane is to be covered, inspect membrane and repair all tears and visible holes with membrane manufacturer's recommended sealing tape. For tears more than 12" long, lap a scrap piece of material to 12" beyond each side of the tear and seal all of the edges with tape.

### 3.3 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 1. Install keyways, recesses, and the like, for easy removal.
  - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

- H. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- I. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.4 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of walls, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
  - 1. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

### 3.5 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
  - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

### 3.6 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
  - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

### 3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
  - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  - 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
  - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
  - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
  - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

### 3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Maintain reinforcement in position on chairs during concrete placement.
  - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  - 4. Concrete slabs shall not slope to drains. Drains to be set level with floor.
  - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

### 3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  - 1. Apply to concrete surfaces not exposed to public view.
  - 2. Prepare exterior face of perimeter wall which is to receive membrane waterproofing.

### 3.10 FINISHING FLOORS, SLABS AND STOOPS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.

- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
  - 1. Apply float finish to surfaces indicated to receive trowel finish.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
  - 1. Apply a trowel finish to surfaces exposed to view.
  - 2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
  - 3. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft. long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.
- E. Broom Finish: Apply to exterior concrete stoops.
  - 1. After the concrete has been floated and is sufficiently harden such that broom marks will not be more than 1/16" deep, brush surface with a stiff, medium bristled broom. Make the broom strokes all in one direction. Make broom strokes on sloped surfaces perpendicular to direction of slope.

### 3.11 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
  - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

### 3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
  1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### 3.13 MISCELLANEOUS CONCRETE WORK

- A. Exterior Door Stoops:
  1. The stoop foundations shall be installed as shown on the drawings. Provide 1/2" preformed filler strips in joints at junctions with walls, walks, etc., where shown. Hold top edge of filler strips 1/2" below finished surface of concrete.
  2. Slope stoop slabs 1/8" to 1/4" per foot to drain away from building.
  3. All stoops shall be provided with expansion joints and/or control joints as indicated on the Drawings and/or as directed by the Architect.
- B. Exposed concrete foundation walls: All exposed concrete foundation walls shall be rubbed as soon as the forms have been removed. A slurry coat over the concrete is not acceptable.

### 3.14 FIELD QUALITY CONTROL

- A. Cooperate with the laboratory in every respect by arranging material for sampling and supplying necessary facilities at the job site for making the field tests and storing specimens.
- B. Tests shall be made for each 50 cubic yards of concrete or fraction thereof, but not less than 2 for each day's pour. Perform the following tests:

1. Compression Test: Make a minimum of 3 standard 6"x12" cylinders for testing, one at the age of 7 days, and one for testing at 28 days, unless otherwise directed. If compression tests are to be used for determining when forms may be removed, make at least 2 additional cylinders and cure on job site in accordance with ASTM C 31.
  2. Tests for Air-Entrainment: Per ASTM C 231, on a random basis, as determined by the Owner's Representative.
  3. Slump Test: Per ASTM C 143. Contractor shall provide cone and make tests whenever requested by Owner's Representative. Test each and every truckload. 1/2" tolerance allowed each way.
  4. Additional Tests: If, in the opinion of the Owner's Representative there is any question as to the quality of the concrete already placed, make additional tests as directed. Tests may be either compression tests on cored cylinders, per ASTM C 42; or load tests as outlined in ACI 318; or as directed. These tests shall be paid for by the Contractor.
- C. Evaluation of Tests: In accordance with ACI 214-83.
- D. Test Reports: Furnish for all tests. Report must show exact location of work represented by samples and tests.

END OF SECTION 033000





**SECTION 042000**  
**UNIT MASONRY**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Face brick.
3. Limestone sills.
4. Mortar and grout.
5. Steel reinforcing bars.
6. Masonry-joint reinforcement.
7. Embedded flashing.
8. Miscellaneous masonry accessories.
9. Anti-Graffiti Coating

B. Related Requirements:

1. Section 024119 "Selective Demolition" for removal of existing face brick and block.
2. Section 033000 "Cast-in-Place Concrete" for masonry setting.
3. Section 055000 "Metal fabrications" for loose lintels.
4. Section 076200 "Sheet Metal Flashing and Trim" for sheet metal flashing and for furnishing manufactured installed in masonry joints.
5. Section 079200 "Joint Sealants" for sealants associated with masonry.
6. Section 084113 "Aluminum Framed Entrance" for aluminum door frames set in masonry wall.
7. Section 085113 "Aluminum Storefront Windows" for aluminum window frames set masonry walls.
8. Section 099113 "Painting" masonry walls painting.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
  1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
  2. Cavity wall insulation.
  3. Masonry ties and reinforcing steel.

4. Fabricated In-wall and thru-wall flashing.
  5. Mortar and grout materials including additives.
  6. Mortar and grout mix compositions.
  7. Masonry control joint accessories.
- B. Submit laboratory test results for mortar and masonry units including design data for grout mixes when grout is to be pumped.
- C. Samples for Verification: For each type and color of the following:
1. Face bricks.
  2. Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.
- D. Qualification Data: For testing agency.
- E. Material Certificates: For each type and size of the following:
1. Masonry units: Include data on material properties
  2. Cementitious materials. Include name of manufacturer, brand name, and type.
  3. Mortar admixtures.
  4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
  5. Grout mixes. Include description of type and proportions of ingredients.
  6. Reinforcing bars.
  7. Joint reinforcement.
  8. Anchors, ties, and metal accessories.
- F. Mix Designs: For each type of mortar and grout. 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 C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
  2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- G. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- H. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

## 1.5 CODES AND STANDARDS

- A. In addition to complying with all pertinent codes and regulations, comply with:
1. Standards of masonry installation described in the recommendations of:
    - a. National Concrete Masonry Association (NCMA).
    - b. Masonry Standards Joint Committee (MSJC) Spec. (ACI 530.1/ASCE 6/TMS 602).
  2. Standards of limestone installation described in the recommendations of Indiana Limestone Handbook, 21st Edition Indiana Limestone Institute.

- B. Fire-Rated Masonry: Wherever a fire-resistance classification is shown or scheduled for unit masonry construction (2-hr., U.L. Design Nos., and similar designations), comply with the masonry materials and installation requirements established by the relevant governing authorities for the constructions shown.

## 1.6 QUALITY ASSURANCE

- A. Sources of Supply: Obtain each kind of masonry units from one manufacturer, of uniform texture and color or uniform blend in the variation thereof, for each kind required, for each continuous area or visually related areas.
- B. Coordination: Coordinate with concrete installers with respect to installation of bar reinforcement in concrete foundations to be extended up into reinforced masonry walls.
- C. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects.
  - 1. Build sample panels for typical exterior wall in sizes approximately 48 inches long by 48 inches high by full thickness.
    - a. Include a sealant-filled joint at least 16 inches long.
    - b. Include through-wall flashing installed for a 24-inch length.
  - 2. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
  - 3. Protect approved sample panels from the elements with weather-resistant membrane.
  - 4. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
    - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.
  - 5. Subject to compliance with requirements, approved sample panel may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

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

## 1.8 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. 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.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
- F. Clean all brick surface prior to installing the Anti-graffiti coating.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

## 2.2 UNIT MASONRY

- A. Face Brick: Hebron Brick “Harmony color and texture to match existing. Contact Mike Wallin at Benson Stone at 815-509-7334.
- B. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.
- C. 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.

## 2.3 CONCRETE MASONRY UNITS

- A. Concrete Masonry Units, except as otherwise indicated:
  - 1. Type: Standard hollow and solid load bearing units made with ASTM C 33 aggregates to conform to ASTM C 90, including a total linear drying shrinkage less than .045%.
  - 2. Sizes and Shapes: 8" x 16" nominal face size; thicknesses as indicated.
    - a. Provide bullnose block on external corner and jamb units and other special conditions as shown. Furnish same square cornered units for sills and heads (installed on-end).
    - b. Provide special shapes where shown and where required for lintels, bond beams and other special conditions.
  - 3. Texture: Face textures of each type of block shall match each other.
  - 4. Cores: 2-core or 3-core block may be used.
    - a. Provide solid block, where required, with core area not exceeding 25% of gross cross sectional area.
  - 5. Moisture Limits: Units shall be cured in a moisture-controlled atmosphere so that when delivered to job site the weight of water contained in the units shall not exceed 35% of the fully saturated capacity of the block.
    - a. Moisture content of units stored at the site shall be maintained so as to not exceed 35% of block saturation capacity when tested by Owner’s testing laboratory.

## 2.4 STONE CAP

- A. Limestone Stone Sill Units: Limestone with size and shapes as per drawings with color to match existing.

## 2.5 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, non-staining, Type I or Type III (as required for cold weather conditions), natural gray.
- B. Masonry Cement: Not permitted.
- C. Hydrated Lime: Conforming to ASTM C 207, Type S.
- D. Sand: Conforming to ASTM C 144, except that 100% shall pass the #8 sieve and 15% - 30% shall pass the #50 sieve.

- E. Grout Aggregate: Gravel or crushed stone well graded from 3/8" to #16 and conforming to ASTM C 404. When fine aggregates are required, conform to ASTM C 404.
- F. Additives: Not allowed, including calcium chloride or other chloride bearing formulations, as well as any air entraining agents except for Water Repellent Additive: W.R. Grace "Dry-Block Mortar Additive" or equal approved by Architect.
- G. Water: Clean, potable, free from oil, soluble salts, acids, alkalis, organic impurities and other deleterious materials.

## 2.6 MORTAR AND GROUT MIXES

### A. Mortar Mix Properties:

- 1. Mortar (lime-cement mortar) per ASTM C 270: Proportion portland cement, damp loose sand, and hydrated lime, by volume to achieve average, in-field, not lab compression strength of 2100 psi at 28 days. Refer to drawings for mortar type.
- 2. Submit specimens for testing when directed by Architect.

### B. Grout Mix Proportions:

- 1. For Embedment of Reinforcing Bars: Coarse Grout per ASTM C 476.
- 2. For Filling Hollow Metal Door Frames: Use mortar, the same as used for adjacent masonry. Where hollow metal frames abut solid construction and filling must be done through a funnel, add sufficient water to mortar to produce a soupy consistency. Fill frames with grout after the frames have been installed.

### C. Mixing:

- 1. Measurements: Measure ingredients precisely.
  - a. Keep water-cement ratio precise from batch to batch.
  - b. Accurately measure sand in damp, loose condition; measurement of sand by shovelful will NOT be allowed. Allow for contraction and expansion of sand's volume as it dries out and it gains moisture.
- 2. Mortar: Mix mortar in a motorized mechanical batch mixer. Ingredients shall be thoroughly mixed according to ASTM C 270 procedures for at least 3 minutes but not more than 5 minutes after all material is in the mixer. Mix only as much mortar as needed for immediate use.
  - a. Cold Weather: When air temperature is 40°F or below, keep water warmed to above 70°F but do not allow it to exceed 160°F. When heating sand, heat slowly and evenly. Scorched sand shall be discarded.
  - b. Exterior Mortar: Add color pigments as required to match the sample selected by Architect.
- 3. Grout: Mix grout thoroughly in a mechanical batch mixer according to ASTM C 476 procedures; hand mixing not allowed without approval. Grout may be premixed and delivered per ASTM C 94. Use only enough water to produce a workable consistency, except that for placement by pump more water may be added.
  - a. Cold Weather: When air temperature is 40°F or below, mix grout according to cold weather restrictions for mortar, and deliver at 70°F-120°F.

4. Admixtures: Do not use admixtures except as specifically allowed by Architect and approved by Owner.
5. Pre-Mixed Mortars: Truck delivered batch mixing shall conform to ASTM C 1142. In addition to regular motorized mixers, Spec-Mix systems may be used. "SILO-MIX" WILL NOT BE ALLOWED.
6. Mortar Mixers, Boxes and Tools: Keep clean; thoroughly clean equipment and tools between batches and at end of each day's work.

D. Retempering:

1. Partially hardened mortar may be re-tempered to replace water lost through evaporation.
2. Do not retemper mortars out of mixer for more than 2-1/2 hours; but, rather, dispose of such mortar.
3. Repointing mortar shall be used within 30 minutes of final mixing; do not retemper or use partially hardened repointing mix.

## 2.7 REINFORCEMENT AND TIES

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

1. AA Wire Products.
2. Heckman Building Products.
3. Hohmann & Barnard.
4. National Wire Products.
5. Masonry Reinforcing Corp. of America (Wire-Bond)

B. Exterior Cavity Wall Reinforcement: Factory welded ladder units with pintle eye extensions 16" o.c. placed to fit at the face of the cavity insulation.

1. Wire Type and Finish: Complying with ASTM A 82, all hot-dip galvanized after fabrication per ASTM A 153, Class B2 (1.50 oz per sq ft).
2. Side Rods: Two deformed #9 wires.
3. Width: 2" less than nominal thickness of backup wythe.
4. Pintle Ties: Double legged 3/16" wire box ties sized to extend at least 1-1/2" into masonry veneer while providing at least 5/8" mortar cover after tooling.

C. Corners and Intersections for Horizontal Joint Reinforcement: Factory fabricated matching "L" and "T" units only. Field fabricated corner units and lapped units at corners and intersections NOT allowed.

D. Bar Reinforcement:

1. Reinforcing Bars: Deformed new billet steel bars conforming to ASTM A 615, Grade 60.
2. Reinforcing Bar Positioners: Prefabricated units formed from #9 galvanized steel wire, specifically fabricated for holding steel reinforcing bars in proper relationship to block cores.

## 2.8 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into masonry but with at least a 5/8-inch cover on outside face.
- B. Ties Anchoring New Masonry to Old Construction: Detail on the drawings.

## 2.9 EMBEDDED FLASHING MATERIALS

- A. Flashing For In-Wall And Thru-Wall Conditions: 40 mil rubberized asphalt membrane, faced with a cross-laminated polyethylene film 8 mil thick on one side. Use one of the following:
  - 1. W.R. Grace "Perm-A-Barrier"
  - 2. Mirafi "Miradri TWF"
  - 3. Nervastral "Bitu-Rap"
  - 4. Polyguard "400 Flashing"
  - 5. Dur-O-Wal "Dur-O-Barrier-44"
  - 6. Carlisle "CCW-705-TWF"
- B. Surface Primer: Flashing membrane manufacturer's recommended surface conditioner.
- C. Mastic Sealant: Flashing membrane manufacturer's recommended mastic sealant for repairing membrane and sealing edges, joints and punctures.
- D. Metal Drip: Stainless steel sheet metal strip fabricated with hemmed drip edge, equal to "Partial Edge" by Dur-O-Wal or "Drip Edge" by Polyguard.
- E. Setting Mastic For Metal Drip: Same mastic as used for repair of flashing membrane.

## 2.10 MISCELLANEOUS MASONRY ACCESSORIES

- A. Cavity Wall Insulation:
  - 1. Rigid Polyisocyanurate Boards: Foil Faced, 48" wide complying with ASTM C 1289, Type 1, Class 2. boards shall have a minimum R-value of 6.5 per 1" thickness at 40°F, and minimum compressive strength of 25 psi, as well as a maximum water absorption of 0.10% by volume: Acceptable product and manufacturer; Thermax Sheathing by Dow Chemical Co. or comparable product as approved by Architect.
  - 2. Thickness: 3" unless specified otherwise.
  - 3. Joint Tape: 3M's "Contractor Sheathing Tape 8086 or as recommended by Insulation board manufacturer"
- B. Expansion and Control Joint Accessories:
  - 1. Bond Breaker Strips: No. 15 asphalt roofing felt conforming to ASTM D 226, or No. 15 coal tar roofing felt conforming to ASTM D 227.
  - 2. Pre-molded Control Joint Strips for Concrete Block: Solid rubber strips with a Shore A durometer hardness of 60 to 80, designed to fit standard sash block and maintain lateral stability in masonry wall, size and configuration as indicated.
- C. Compressible Joint Filler: Fire rated mineral fiber insulation, full width and thickness of joint.



- D. Mortar Net: 10" high x 1 1/2" thick dovetail polyester material; "Mortar Net" by Mortar Net or "Mortar Net" by Sandell Mfg. Company, Inc.
- E. Cell Vents: 3/8" x 2 1/2" x 3 3/8" polypropylene plastic, color as selected by Architect from manufacturer's submitted color samples; "Cell Vent" by Sandell Mfg. Company, Inc. or comparable product as approved by Architect.
- F. Anti-Graffiti Coating: "Defacer Eraser Sacrificial Coating SC-1" by Prosoco or Owner approved equal during the bidding phase.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
  - 2. Verify that foundations are within tolerances specified.
  - 3. Verify that reinforcing dowels are properly placed.
  - 4. Verify that substrates are free of substances that would impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Build chases and recesses to accommodate items specified in this and other Sections.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

### 3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
  - 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
  - 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
  - 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

### 3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
  - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
  - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
  - 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints to match existing when thumbprint hard.

### 3.6 CAVITY WALL CONSTRUCTION

- A. Back-Up Wythe:
  - 1. Build block backup first and tool the joints concave on both faces.
  - 2. Tool the mortar tightly around the stems that hold the pintle eyes.
  - 3. Carefully locate horizontal joint reinforcing in the back-up wythe so that when the pintles are inserted into the pintle eyes, the pintles will fit tightly against the face of the cavity insulation.
- B. Insulation: Fit boards tightly between metal pintle eyes just before placement of pintle ties. Butt joints as tightly as possible and stagger vertical joints between courses.
  - 1. Joints: Tape over all joints with 3M's "Contractor Sheathing Tape 8086.
  - 2. Corners: At major outside and inside corners of the building, extend the insulation boards across the cavity to the inside face of the exterior wythe, to block air movement around the corner.
- C. Veneer Wythe: Build brick veneer after joints in backup block have been tooled.
  - 1. Place additional ties adjacent to each side of window and door openings, within 12" of jambs, spaced a maximum of 16" o.c. vertically.
  - 2. Tie Embedment: Do not lay tie on brick and top with mortar; rather, embed ties into mortar.
  - 3. Veneer Reinforcement: Provide longitudinal wire reinforcement in concrete block veneer wythe, spaced 24" o.c. vertically. When not using ties with seismic clips and attached wire, provide ladder/truss reinforcing in the horizontal joints 16" o.c., alternating between the joints that contain ties.
  - 4. Tops and Bottoms of Walls: Place joint reinforcement continuous in first and second joint above bottom of walls and below top of walls.

5. Openings: Place masonry joint reinforcement in first and second horizontal joints above and below openings, extending reinforcement at least 16" beyond each side of opening.
  6. Joining Reinforcement Wires: Lap ends a minimum of 6". Continue wire around corners. Do not join wires when within 18" of a corner.
- D. Cavity: Provide not less than a 1-1/2" air space between brick veneer and cavity insulation.
- E. Keep cavity clean of mortar droppings by beveling the bed mortar to incline towards the cavity. Excessive mortar droppings into cavity will not be tolerated.
1. Cavity Bottoms: At flashing at base of wall and over each thru-wall flashing, provide a course of "Mortar Net" after the first course of block has been applied above the flashing.
- F. Cavity Cells: Block off the cavity at major outside and inside corners with vertical strips of foam backer rod in order to prevent air flow around the corners. Locate backer rods within 4ft of corners. In similar fashion, block off the cavity between corners so that no expanse of cavity exceeds 20 feet horizontally.
- G. Weep and Vents: Provide cavity vents at bottom of wall by leaving empty head joints at 32" o.c.

### 3.7 MASONRY-JOINT REINFORCEMENT

- A. Horizontal Joint Reinforcement: Reinforce concrete block and face brick walls as follows:
1. Typical Spacing: Install wire reinforcement in horizontal joints, spaced 16" o.c. vertically.
  2. Tops and Bottoms of Walls: Place joint reinforcement continuous in first and second joint above bottom of walls and below top of walls.
  3. Openings: Place masonry joint reinforcement in first and second horizontal joints above and below openings greater than 1'-0" wide, extending reinforcement at least 16" beyond each side of opening.
  4. End Laps: Lap joint reinforcement ends a minimum of 6", placing a cross wire of each piece within the lap.
  5. Intersections and Corners: Use only preformed welded units at corners and intersections, extending at least 18" each way; do not lap straight units at "T" intersections nor cut and bend joint reinforcement at "L" corners.
  6. Mortar Coverage: Fully embed longitudinal side rods in mortar for their entire length: minimum cover of 5/8" on exterior side of walls after tooling and 1/2" at other locations.
  7. Control and Expansion Joints: Break reinforcement at control joints. Do not bridge control or expansion joints with reinforcing except at wall openings.

### 3.8 BAR REINFORCED MASONRY

- A. Concrete Block Placement:
1. Set block webs in full mortar beds to maintain leak-free cells. Fill end joints to the full depth of face shell thickness.
  2. Maintain grout spaces free of excess mortar and debris.

B. Bond Beam Reinforcement:

1. Make bond beams continuous. Step bond beams as required in field.
2. Reinforce bond beam with two No. 4 bars placed 1" from bottom web when not indicated otherwise.
3. Place reinforcement in accordance with ACI 315. Return bars around corners a minimum of 8". Do not use defective bars or bars bent incorrectly.
4. Lap the splices to provide at least a Class A splice per ACI 318.

C. Grouting:

1. Remove loose rust and scale from reinforcing bars and remove rust, ice, water and dirt from cavity bottoms before pouring grout.
2. Grout walls using low-lift grouting technique in lifts not more than 5ft high, allowing at least 24 hours to pass between successive lifts.
3. Place grout continuously; do not interrupt pouring of grout for more than one hour. Do not disturb reinforcement while placing grout.
4. Consolidate grout 5 to 10 minutes after pouring. Puddle and rod the grout.

### 3.9 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

### 3.10 LINTELS

A. Install steel lintels furnished under Section 055000 "Metal Fabrications".

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

### 3.11 FLASHING

A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.

B. Locations: Install thru-wall flashings at the following masonry locations, whether shown or not:

1. At base of exterior masonry walls.
2. At intersections between a low roof and high masonry wall.

3. Over all exterior lintels.
- C. Thru-Wall Flashing Fabrication: Form typical thru-wall flashings by adhering self-adhesive flashing membrane to a stainless steel edge drip, adhering membrane all across the top of the sheet metal. Trim membrane at edge of metal drip.
  1. Install the metal edge drip to make continuous runs. Make “dollar” lap joints, overlapping joints 6"; or lap the metal joints 1" and fill with the mastic used to set the edge drip. Trim the metal length to match the width of the flashing except at lintels, where the length of metal shall be cut to match the width of the door/window opening.
- D. Thru-Wall Flashing Installation:
  1. Comply with flashing membrane manufacturer’s temperature limitations.
  2. Install in one piece to the extent practicable. Lap flashing 6" at joints and seal joint edges continuously.
  3. Lintel Flashings: Extend flashings past ends of lintel and fold flashing up into first head joints beyond end of lintel to form a positive end dam.
  4. Step Flashings: At the end of each section of flashing, fold flashing at least 1" up into a head joint so as to form a positive end dam.

### 3.12 MORTAR JOINT FINISHING

- A. Flush Joints: Strike interior wall joints flush where masonry is to be covered by other materials.
- B. Tooled Joints: Tool all joints not concealed by other work.
  1. At time of laying, strike masonry joints flush.
  2. When mortar in joints becomes thumbprint hard, tool to a hard, concave finish, using sled-type jointer at least 16" long, with diameter 1/8" to 1/4" larger than joint.
  3. Jointing tools shall be same diameter for each type of masonry.
- C. Caulked Joints: Rake out joints 1/2" deep where caulking is required.

### 3.13 FITTING AND PATCHING

- A. Do all cutting and patching of masonry for the Work required by other trades.
- B. Replace damaged masonry. Spot patching of exposed units with mortar must be inconspicuous.
- C. Cut and fit for chases, pipes, conduits, sleeves, etc. Cooperate with other trades to provide correct size, shape and location. Avoid cutting and patching to accommodate work under other Sections by coordinating masonry work with other trades.

### 3.14 REPAIR AND FINAL POINTING

- A. At completion of the work, cut out and repoint all holes, cracks and defective joints, using mortar colored to match after it dries. Cut out hardened mortar to a depth of 1/2" and dampen the hardened mortar before patching.
- B. Retool and reclean joint patches to match adjacent work. Leave exterior walls watertight.

### 3.15 CLEANING

- A. Remove excess mortar and droppings as work progresses, avoiding stains and smears. Do not allow excess mortar lumps or smears to harden on finish surfaces.
- B. Clean the interior masonry before application of floor finishes is started.
- C. Concrete Block: When concrete masonry unit placement is complete, rub masonry with carborundum brick to remove all sharp edges and then clean work with stiff bristle brushes, or other approved method, removing loose granules, building dust, etc. Comply with recommendations of NCMA TEK Bulletin 28.

### 3.16 PROTECTION

- A. At day's end and when precipitation is anticipated, cover tops of unfinished walls with plastic sheeting to prevent moisture infiltration.
- B. Protect exposed external corners that may be damaged by construction activities.
- C. Brace and shore masonry constructions until they are able to withstand ambient wind loads.
- D. Do not allow uniform structural loads to be applied to unbraced or unshored masonry for at least 12 hours after construction. Protect from concentrated loads for at least 3 days after construction.

### 3.17 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000





DIVISION 05 – METALS  
**SECTION 051200**  
**STRUCTURAL STEEL FRAMING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. SUMMARY
  - 1. Structural steel.
  - 2. Field-installed shear connectors.
  - 3. Grout.
- C. Related Requirements:
  - 1. Section 052100 "Steel Joist framing" for bearing on structural steel framing.
  - 2. Section 053100 "Steel Decking" for field installation of shear connectors through deck.
  - 3. Section 055000 "Metal Fabrications" for miscellaneous steel fabrications and other steel items not defined as structural steel.
  - 4. Section 099113 "Painting" for surface-preparation and priming requirements.

1.2 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
  2. Include embedment Drawings.
  3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
  4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
- C. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Mill test reports for structural steel, including chemical and physical properties.
- C. Product Test Reports: For the following:
1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  2. Direct-tension indicators.
  3. Tension-control, high-strength, bolt-nut-washer assemblies.
  4. Shear stud connectors.
  5. Shop primers.
  6. Nonshrink grout.
- D. Survey of existing conditions.
- E. Source quality-control reports.
- F. Field quality-control reports.

## 1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with applicable provisions of the following specifications and documents:
1. AISC 303.
  2. AISC 360.
  3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
  1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
  2. Clean and relubricate bolts and nuts that become dry or rusty before use.
  3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.
- B. Moment Connections: Type PR, partially restrained.
- C. Construction: Moment frame.

### 2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Corrosion-Resisting Structural-Steel Shapes, Plates, and Bars: ASTM A 588/A 588M, Grade 50 (345).
- E. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.
- F. Corrosion-Resisting, Cold-Formed Hollow Structural Sections: ASTM A 847/A 847M, structural tubing.
- G. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
  1. Weight Class: As noted on drawings.
  2. Finish: Black except where indicated to be galvanized.
- H. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.
- I. Steel Forgings: ASTM A 668/A 668M.

- J. Welding Electrodes: As noted on drawings.
- K. Where fire proofing is called for on the drawings, omit the prime painting of the steel.

## 2.3 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.
- C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.
  - 1. Finish: Hot-dip or mechanically deposited zinc coating.
- D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
  - 1. Finish: Plain.
- E. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- F. Unheaded Anchor Rods: ASTM F 1554, Grade 36.
  - 1. Configuration: Straight and Hooked.
  - 2. Nuts: ASTM A 563 (ASTM A 563M) -]hex carbon steel.
  - 3. Plate Washers: ASTM A 36/A 36M carbon steel.
  - 4. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
  - 5. Finish: Plain .
- G. Headed Anchor Rods: ASTM F 1554, Grade 36.
  - 1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
  - 2. Plate Washers: ASTM A 36/A 36M carbon steel.
  - 3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
  - 4. Finish: Plain.
- H. Threaded Rods: ASTM A 36/A 36M.
  - 1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
  - 2. Washers: ASTM A 36/A 36M carbon steel.
  - 3. Finish: Plain .

- I. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.
- J. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

## 2.4 PRIMER

- A. Primer: Comply with Section 099113 "Painting"
- B. Primer: SSPC-Paint 25, Type I, zinc oxide, alkyd, linseed oil primer.
- C. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- D. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

## 2.5 GROUT

- A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.
- B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.6 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.
  - 1. Camber structural-steel members where indicated.
  - 2. Fabricate beams with rolling camber up.
  - 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
  - 4. Mark and match-mark materials for field assembly.
  - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
  - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning."
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural-steel frame. Straighten as required to provide uniform, square, and true members in completed wall framing. Build up welded framing, weld exposed joints continuously, and grind smooth.
- H. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
  - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
  - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

## 2.7 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.

## 2.8 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
  - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
  - 2. Surfaces to be field welded.
  - 3. Surfaces of high-strength bolted, slip-critical connections.
  - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
  - 5. Galvanized surfaces.
  - 6. Surfaces enclosed in interior construction.
  - 7. Surfaces to receive fireproofing. See code plan on architectural drawings for locations.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
  - 1. SSPC-SP 2, "Hand Tool Cleaning."

- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
  - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
  - 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.
- D. Painting: Prepare steel and apply a one-coat, nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

## 2.9 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
  - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
  - 2. Galvanize lintels attached to structural-steel frame and located in exterior walls.

## 2.10 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
  - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Bolted Connections: Inspect and test shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
  - 1. Liquid Penetrant Inspection: ASTM E 165.
  - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
  - 3. Ultrasonic Inspection: ASTM E 164.
  - 4. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
  - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  - 2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.
- E. Prepare test and inspection reports.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
  - 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
  - 1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

### 3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
  - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.



- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

### 3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

### 3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
  - 1. Verify structural-steel materials and inspect steel frame joint details.
  - 2. Verify weld materials and inspect welds.
  - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
  - 1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - a. Liquid Penetrant Inspection: ASTM E 165.

- b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
  - c. Ultrasonic Inspection: ASTM E 164.
  - d. Radiographic Inspection: ASTM E 94.
- E. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
  - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  - 2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

END OF SECTION 051200

**DIVISION 05 – METALS**  
**SECTION 053100**  
**STEEL DECKING**

**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. Metal roof deck.
  - 2. Accessories and closures.
  - 3. Fabrication of openings in metal deck not shown on Drawings but required by other trades.
  - 4. Reinforcement of small openings in metal deck
- B. Related Requirements:
  - 1. Section 052100 "Steel Joist Framing" for deck bearing.
  - 2. Section 055000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings:
  - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.

## 1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- B. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

### 2.2 ROOF DECK

- A. Acceptable Manufacturers:
  - 1. Bowman/E.G. Smith, Div. Cyclops Corp.
  - 2. Epic Metals Corp.
  - 3. Roll Form Products, Inc.
  - 4. United Steel Decking, Inc.
  - 5. Vulcraft/Div. Nucor Corp.
  - 6. Cordeck
- B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
  - 1. Steel for Galvanized Metal Deck Units: ASTM A653/A653M, Structural Quality Grade SS33. Galvanizing shall conform to ASTM A924/A924M with a minimum coating class of G30 (Z090) as defined in ASTM A6563/A653M.
  - 2. Deck Profile: As indicated on drawings.
  - 3. Profile Depth: As indicated on drawings.
  - 4. Design Uncoated-Steel Thickness: As indicated on drawings.
  - 5. Span Condition: Three span, u.n.o. on drawings.
  - 6. Side Laps: Overlapped or interlocking seam at Contractor's option.

## 2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch minimum thick, with factory-punched hole of 3/8-inch minimum diameter.
- G. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

### 3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
  - 1. Weld Diameter: 5/8 inch, nominal.
  - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds 12 inches apart in the field of roof and 6 inches apart in roof corners and perimeter, and as indicated on drawings, based on roof-area definitions in FMG Loss Prevention Data Sheet 1-28.
  - 3. Weld Washers: Install weld washers at each weld location.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 18 inches, and as follows:
  - 1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
  - 2. Mechanically clinch or button punch.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
  - 1. End Joints: Lapped 2 inches minimum.
- D. Miscellaneous Roof-Deck Accessories: Install finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.
  - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.
- C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

### 3.5 PROTECTION

- A. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

PART 4 - END OF SECTION 053100





DIVISION 05 – METALS  
**SECTION 054000**  
**COLD FORMED METAL FRAMING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. SUMMARY
  - 1. Cold formed metal framing and accessories.
- C. Related Requirements:
  - 1. Section 042000 "Unit Masonry" for CMU wall backing.
  - 2. Section 051200 "Structural Steel Framing" for structural steel framing.
  - 3. Section 061000 "Carpentry Work" for plywood sheathing and weather barrier.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

1.3 SUBMITTALS

- A. Product Data: Provide shop drawings prepared by cold-formed metal framing manufacturer. Submit manufacturer's data for all steel stud framing items required, showing pertinent features.
- B. Shop Drawings: Submit details of construction for Architect's review. Include design assumptions and calculations for loads and stresses.
- C. Shop drawings shall be sealed by a Licensed Structural Engineer in the State of Illinois.

1.4 QUALITY ASSURANCE

- A. Fabricator's Qualifications: Minimum of 5 years' satisfactory experience producing items of like quality and type.

B. Component and System Design:

1. Design wall framing to the requirements of 2015 IBC, based on a uniformly distributed wind load of 30 psf, positive and negative pressure, with maximum allowable deflection of 1/600 span. When heads of studs will not be completely restrained, as at some deflection heads, do not use manufacturer's load tables but select stud size and gauge based on calculation of actual deflection resulting from the less-than-ideal stability of the top of the stud. Include for concentrated axial loads created by window weights.
2. Compute structural properties of studs in accordance with AISI "Specifications for the Design of Cold-Form Steel Structural Members" and AWCI (Association of Wall and Ceiling Industries) requirements, the more stringent requirement governing in case of differences.
3. Design the wall system to accommodate seasonal or cyclical day/night temperature variations without noise, damage, failure of joint seals, undue stress on fasteners, or other detrimental effects.
4. Design the system to accommodate construction tolerances and deflection of building structures.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Qualify welding processes and welding operators in accordance with the AWS "Standard Qualifications Procedure."
2. Submit to the Architect, upon request, current certifications that welders employed on the site have passed all required AWS qualification tests within the previous 12 months.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect and store metal framing units from rusting and damage in accordance with A.I.S.I.'s "Code of Standard Practice".

PART 2 - PRODUCTS

2.1 MATERIALS

A. Acceptable Manufacturer: One of the following:

1. Aegis Metal Framing.
2. ClarkDietrich Industries, Inc.
3. MarinoWare.
4. MRI Steel Framing.

2.2 Studs: Sheet Steel per ASTM A 653, and A 1003/A 1003M gauges as shown on Drawings but not less than 18-gauge, galvanized finish minimum G-60 coating.

1. Steel Grade:
  - a. 33-ksi minimum for 18 ga. and lighted members.
  - b. 50-ksi for 16 ga and heavier members.

2. Minimum uncoated steel thicknesses:
  - a. 18-gauge .0428" (yellow)
  - b. 16-gauge .0538" (green)
  - c. 14-gauge .0677" (orange)
  - d. 12-gauge .0966" (red)
- B. Track and Accessories: Include all track and sheet metal accessories required, fabricated from matching metal.
- C. Screw Fasteners: Cadmium coated.

## PART 3 - EXECUTION

### 3.1 FRAMING

- A. General: Erect metal framing per the requirements of ASTM C 1007.
- B. Studs, track, bracing, etc. shall be used and erected as recommended by manufacturers. Connections shall not induce distortions into the framing.
- C. Runner Tracks: Install continuous tracks, straight and true, accurately aligned to the layout at base and at tops of studs. Anchor track at corners and ends.
- D. Set studs plumb, except as indicated otherwise, not more than 16" o.c. and not more than 2" from abutting walls. In each line of studs, face flanges all in the same direction. Erect studs one-piece full length; splicing not permitted.
- E. Secure studs to runners, top and bottom, at both inside and outside flanges, by either welding or screwing with the equivalent of 2 Type "S" screws.
- F. Bridging: Install between studs as required to prevent stud rotation.
- G. Supplementary Framing: Install blocking and bracing to support other work requiring attachment to the framing system. Where type of supplementary support is not otherwise indicated, comply with the stud manufacturer's recommendations and industry standards, considering the weight or loading resulting from the item supported.
- H. Junctures With Masonry Structures: Provide compressible filler strip at least 1/2" thick between top runners and structure above. Where studs abut masonry or concrete, install 1/2" thick compressible filler strip full height of stud.
- I. Welding: Perform welding, including tack welds, in accordance with ANSI/AWS D1.1 and AWS D1.3.
  1. Protect members from damage caused by welding. Provide non-combustible shield during welding operations.
  2. Touch-up welds on hot-dip galvanized items with zinc-rich paint after cleaning joint of welding residues.

END OF SECTION 054000



DIVISION 05 – METALS  
**SECTION 055000**  
**METAL FABRICATIONS**

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. Items fabricated from iron and steel shapes, plates, bars, strips, tubes and pipes which are not part of the steel structural framing or other metal systems in other Sections of the Specifications. The items of this Section include but are not necessarily limited to the following:
  - a. Steel lintels and miscellaneous framing members.
- 2. Anchorages of type appropriate to the supporting structure and as required to provide a sturdy installation resistant to all reasonable loads.
- 3. Cutting, reinforcing, drilling and tapping as required to erect the work and to fit it with work provided under other Sections of the Specifications.

- B. Related Requirements:

- 1. Section 042000 "Unit Masonry" for masonry wall construction.
- 2. Section 099113 "Painting" Finish painting.

1.3 COORDINATION

- A. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorage that are to be embedded in existing masonry. Deliver such items to Project site in time for installation.

1.4 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for:
  - 1. Loose steel lintels.
  - 2. Miscellaneous steel framing members.

## QUALITY ASSURANCE

- B. Field Measurements: Take prior to preparation of Shop Drawings and fabrication, where possible. Take measurements in time, so as to avoid delaying job progress. Allow for trimming and fitting.
- C. Qualifications of Welders: Welding operators for shop fabrication shall be qualified, in accordance with AWS "Standard Qualifications Procedure."
- D. Codes and Standards: Comply with the following unless otherwise indicated:
  - 1. AISI, Steel Products Manual, Stainless and Heat Resisting Steel.
  - 2. ANSI A58.1, Minimum Design Loads in Buildings and Other Structures.
  - 3. AWS D1.1 "Structural Welding Code."
  - 4. OSHA: 1910.27 and 1926.1053.
  - 5. All applicable building codes having jurisdiction.
  - 6. Americans with Disabilities Architectural Guidelines.

## 1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: For fabrication of miscellaneous metal work that will be exposed to view, use only materials that are smooth and free of surface blemishes, including pitting, seam marks, roller marks, rolled trade names and roughness.
  - 1. Steel Plates, Shapes, and Bars: ASTM A 36.
  - 2. Steel Tubing: Hot-formed, welded or seamless, ASTM A 501.
  - 3. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
- B. Anchor Bolts: Unfinished threaded fasteners per ASTM A 307, nonheaded type unless otherwise indicated
- C. Metal Primer Paint: Comply with VOC limit requirements of Green Seal Standard GS-11.
- D. Touch-Up Paint For Galvanized Surfaces: Zinc-rich, inorganic cold galvanizing compound having a minimum of 80% zinc dust in the dry film, such as Carboline Carbo Zinc or Carbo Weld; or Z.R.C.

### 2.2 SHOP FINISH

- A. Shop Painting: One-coat shop paint in accordance with Society for Protective Coatings (SSPC) System Guide No. 7.00, except apply 2 coats of paint to surfaces that will be inaccessible after assembly or erection.

1. Extent: Shop paint all miscellaneous and ornamental metal work, except surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.
2. Surface Preparation: Remove scale, rust, grease, oils and other deleterious materials before applying shop coat of paint.

B. Galvanizing:

1. Coating Weights: Items indicated to be galvanized shall be hot-dip galvanized according to the following specifications:
  - a. Assembled steel products: ASTM A 386, 1.25 oz./sq. ft.
  - b. Structural steel shapes: ASTM A 123, 1.25 oz./sq. ft.
  - c. Steel hardware: ASTM A 153, 1.25 oz./sq. ft.
2. Fabrication: Galvanize only after fabrication. Drilling, welding and other fabrication, except bolting, shall be completed before galvanizing. Welds shall be free of slag and residue.
3. Quenching: Galvanized items shall be passivated in a water quench.
4. Galvanizer's Affidavit: Galvanizer shall inspect galvanizing after dipping and submit notarized affidavit certifying compliance with these specifications.
5. Grade Stamp: Stamp each item, indicating ASTM designation and weight of coating.

## 2.3 FABRICATION – GENERAL

- A. Sizes and Thicknesses: As shown, or, if not shown, as required to produce adequate strength and durability in the finished products. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
- B. Preassembly in Shop: Preassemble the items in the shop to greatest extent possible, to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Dissimilar Metals: Wherever dissimilar metals come into contact, insert lead washers, spacers or gaskets between them to provide electrolytic insulation.
- D. Workmanship: Form exposed work true to line and level, with accurate angles and surfaces and straight, sharp smooth edges.
- E. Welds: Weld corners and seams continuously and in accordance with recommendations of American Welding Society. Grind exposed welds smooth and flush.
- F. Items to be Galvanized: Complete drilling, welding and other fabrication, except bolting, before galvanizing. Clean welds of slag and residue. Provide vent holes as required.

## 2.4 FABRICATION SPECIFICS

- A. Miscellaneous Steel Framing: Provide structural framing members standard and galvanized as noted on drawings which are not a part of Structural Steel.
- B. Loose Steel Lintels:

1. General: Furnish loose structural steel lintels for installation over openings where shown or called for on drawings.
2. Finish: Steel and galvanized steel where noted on drawings.
3. Composite Constructions: Weld adjoining members together to form single unit unless indicated otherwise.
4. Bearing: Provide for at least 8" bearing at each side of openings unless opening is less than 6'-0" wide, in which case, provide at least 6" of bearing at each side.

## 2.5 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls.

## 2.6 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
  1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
  2. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Contractor shall verify all opening sizes in field prior to developing shop drawings.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- D. Field Welding: Comply with the following requirements:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
  5. All contacts with steel angles shall be welded.



- E. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

### 3.2 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000



**SECTION 062000**  
**CARPENTRY WORK**

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. Wood blocking and nailers.
- B. Installation of wood doors and door hardware.
- C. Provide and install new plastic laminate cabinets, countertops, and wall caps.
- D. Plastic laminate mailboxes.
- E. Related Requirements:
  - 1. Section 081416 "Flush Wood Doors" for wood door to be installed.
  - 2. Section 087110 "Door Hardware" for finish hardware to be installed in wood door installation.
  - 3. Section 092900 "Gypsum Board System" for gypsum board to be installed.
  - 4. Section 101400 "Interior and Exterior Signage" for 4" cast aluminum letters to be installed on front desk.

1.3 SUBMITTALS

- A. Product Data:
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. Submit manufacturer's product data for premanufactured items.
- B. Shop Drawings: Include all shop fabricated items.
  - 1. Show location and quantity of each item, dimensioned plans and elevations, large scale details, anchors, hardware and other components. Show cabinets in relation to adjacent work. Where required, show electrical service runs.
  - 2. Highlight any field dimensions required to be maintained by other trades.
  - 3. Indicate compliance with AWI Quality Grade, and other specified requirements for materials and workmanship.

- C. Samples: Upon Architect's request, submit Samples of each of the following items:
  - 1. Exposed Cabinet Hardware: 1 unit of each type and finish.
  - 2. Plastic Laminates.
- D. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- E. Evaluation Reports: For Wood-preserved-treated wood, from ICC-ES.

#### 1.4 QUALITY ASSURANCE

- A. Quality Standards: Except as otherwise approved, comply with "Custom Grade" provisions of Architectural Woodwork Institute's (AWI) "Architectural Woodwork Quality Standards."
- B. Americans with Disabilities Act (ADA) Requirements: Cabinetry, where specifically indicated on Drawings as "ADA," shall comply with Federal Register Volume 56, No. 144, Rules and Regulations.
- C. Measurements: Before proceeding with millwork to be fitted to other construction, obtain field measurements and verify dimensions and Shop Drawing details as required for accurate fit.
- D. Workmen: Use only tradesmen experienced in the fabrication and installation of millwork.

### PART 2 - PRODUCTS

#### 2.1 ACCEPTABLE MILLWORK SUPPLIERS

- A. The Horizon Group, Davenport, Iowa
- B. Pierce Laminated Products, Rockford, Illinois.
- C. TMI Systems, Inc.
- D. Or approved equal.
  - 1. Must be submitted 10 days prior to bid opening. On supplier letterhead, a list of any specific variances to our specifications, confirmation that supplier will provide both premanufactured and millwork items as applicable, comply with AWI standards or provide certification of AWI, a list of at least 6 recent public educational/municipal project references and a statement clarifying that supplier will meet or exceed these specifications, for Architects full review.

#### 2.2 WOOD BASED MATERIALS

- A. GENERAL
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Dress lumber, S4S, unless otherwise indicated.
  - 3. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

4. Cabinet Materials:
  - a. Wood shall be AWI Custom Grade, unless otherwise indicated, of an average moisture content within 5% to 10% ranges.
  - b. Cabinetwork Materials: As listed under Fabrication
5. Particle Board: Oriented strand board (OSB) conforming to DOC PS 2, APA rated Structural 1, Exposure 1 grade, thicknesses as listed under 2.5.

## 2.3 PLASTIC LAMINATE

- A. Approved Manufacturers: Wilsonart Premium AEON or equal by Formica, Pionite, Laminart, Nevamar, Up to 4 colors shall be selected by architect from any of the above named manufacturers. Selections and placement of laminates to be shown on shop drawings.
- B. Plastic Laminate: NEMA type Ld3:
  1. Countertops and Wall Caps: .048" thick Post Form Grade GP50 grade, general-purpose type.
  2. Exposed Cabinetwork and Panels: .028" thick (+ .004") vertical-surface, high pressure type (GP28 Grade).
  3. Cabinet Interiors: Melamine interior sheets (CL20 Grade). Or thermally fused melamine laminate in situations that meet standards of AWI Custom Grade. Interior color of open cabinets shall be GP28 to match exterior surfaces.
  4. Totally Concealed Faces: .020" thick, BK20 or CL20 grade, back-up sheets.
  5. Panels: .028" thick, GP28 grade, vertical-surface type.
  6. Edging: 3mm PVC at door and drawer edges and of solid, color-through, high-impact vinyl, 3mm thickness, machine applied with hot melt adhesive. color and gloss as selected by Architect from full line of manufacturer's standard colors and finishes.

## 2.4 TACKBOARDS

- A. Core: Fiberboard 1/2" thick, such as manufactured by Homasote, wrapped with woven fabric securely fixed to the backside of each panel.
- B. Fabricate for attachment to walls with at least 2 concealed, theft-resistant hangers per tackboard.
- C. Fabric: Designtex Union Cloth 4134 or approved equal, color as selected by Architect from manufacturer's full range of colors.
- D. Construction: Stretch the woven fabric around the fiberboard, keeping fabric pattern neatly in line with edge of panel. Securely fix fabric to the backside of each panel, making neat corners with no gaps or ridges.

## 2.5 MAIL BOXES

- A. Materials:
  1. Plastic Laminate Finish: Refer to 2.3 for plastic laminate surfacing.
  2. Ends, Tops and Bottoms Cores: 3/4" particleboard.

3. Backs & Dividers Cores: 1/2" thick particleboard.
4. Shelf Cores: 1/4" thick particleboard, full depth of mailbox.
5. Backing Sheet: Apply laminate to reverse side of all laminate finished panels.
6. Name plates for each mail compartment. Clear plastic label holders with insert slot and white cardstock. Adhesive back. Such as ULINE S-15588 1" x 3" label. Size must fit on front of each mailbox slot. Review placement with owner.

## 2.6 CAST ALUMINUM LETTERS

A. 4" High letters for front desk to be provided and installed under 101400 Interior and Exterior Signage section. See drawings.

## 2.7 CABINET HARDWARE

- A. Pulls: Brass wire pull with satin chrome finish.
- B. Hinges: Concealed, self-closing type of heavy gauge metal construction, 165° swing, passing 200,000 open/close cycle test; and backed by hinge manufacturer's standard material replacement guarantee.
  1. Adjustability: Fully adjustable for clockwise, counter-clockwise, toe-in and toe-out door alignment. Provide base plates to maintain 1/8" reveals between door/drawers within the same cabinet, and between doors of adjoining cabinets.
  2. Finish: Hinge manufacturer's standard corrosion resistant finish. Colored finishes shall be subject to Architect's approval for color compatibility with cabinet finish selected.
- C. Magnetic Cabinet Door Catches: Knappe & Vogt 916, Stanley 46 ALD, Hager 1437 and 1438, or Engineered Products 590 and 591.
- D. Drawer Slides: 1 pair per drawer.
  1. Standard Drawers: Self-closing design with positive in-stop, out-stop and out-keeper to maintain drawer in 80% open position; captive nylon rollers, front and rear; minimum 100 lb. dynamic load rating at 50,000 cycles and 150 lb. static load rating at full extension; epoxy coated, bottom corner mounted.
  2. Guarantee: All drawer slides shall be furnished with manufacturer's lifetime warranty.

## 2.8 FASTENERS/SUPPORT FRAMING

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
  1. Where rough carpentry is pressure-preservative treated provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
  1. Nails: Ring-shank or rough coated finish, size and type to suit application.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Screws: Plain steel; wood or sheet metal shank; flat, countersunk Phillips or square drive head.

- E. Bolts, Nuts, Washers: Size and type to suit application; unfinished in concealed location.
- F. Interlocking Mechanical Fasteners: Conforming to 400B-S-8.A or 1600B-S-4.A or to Sections 14 and 25 of the Woodwork Institute of California's manual of millwork; corrosion resistant finish.
- G. Panel Clips: 2 ½" pairs steel, pre-punched, 2 hole "Panelclips" as supplied by Brooklyn Hardware or comparable clips recommended by millwork supplier and as approved by Architect.
- H. Millwork Fabrications Attachment Hardware & Support Framing: Exposed metal shall be stainless steel of shapes and sizes as noted on drawings.

## 2.9 SHOP FABRICATION

- A. General:
  - 1. Adhesives: Use waterproof, resorcinol-formaldehyde type adhesive. Products made with urea-formaldehyde or melamine-formaldehyde must comply with HPMA Standard FTM 2 for emissions.
  - 2. Loose Joints: Locate loose joints so as to render them as inconspicuous as possible in the finished work.
- B. Countertops and Wall Caps: Comply with AWI Section 400, Custom Grade except as specified otherwise.
  - 1. Cores: At sinks, tops shall have Marine Grade plywood cores or particleboard cores constructed with waterproof phenolic resins. Thickness: Minimum 1."
  - 2. Apply plastic laminate finish in full, uninterrupted sheets consistent with manufactured sizes. Make corners and joints hairline. Front edges including applied back splashes. Self edge of finished laminate. See drawings.
  - 3. Back the tops with a minimum .020" backer sheet.
  - 4. Backsplashes and side splashes to be fit to wall with location of splash marked on countertop. Between the splash and countertop a bead of clear silicone is to be applied and the splash is to be fastened to the top with screws from below: Include 4" high x 1" thick backsplashes and endsplashes wherever countertops abut vertical surface.
  - 5. Splice Joints: Continuous countertops requiring splice joints shall be aligned with dowels and splines and shall be joined with Tite-Joint type fasteners and wood glue to make a uniform and gapless joint. Provide structural framing under countertops within 8" of each side of joint. Locate countertop joints at least 15" from sink cutouts.
  - 6. Cutouts: Cut openings for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures and fitments to be installed under other Sections of the Specifications. Verify locations of cutouts from site measured dimensions. Verify size of opening with actual size of equipment to be used, prior to making openings. Form inside corners to a radius of not less than 1/8". After sawing, smooth the edges of cutouts to ensure crack-free openings.
  - 7. Sink Cutout Edges: Seal exposed edges of sink cutouts with a waterproof sealer recommended by the plastic laminate manufacturer.
  - 8. Hinged Countertop Brackets: Install two folding table brackets utilizing pan head screws for mounting to end of base counter.
- C. Cabinets:

1. General: Comply with AWI Section 400, Custom Grade. Shop fabricate items in sizes to ensure passage through the building without the necessity to modify any building openings. Form joints to conceal shrinkage.
2. Face Style: Flush overlay.
3. Frame Fabrication: Fabricate members that mate to walls with undercut to allow scribing in the field.
4. Cabinetwork for Plastic Laminate Finish: Plastic laminate on all exposed and semi-exposed surfaces.
  - a. Balanced construction as defined by AWI custom grade shall be utilized.
  - b. Panel Cores: 3/4" particleboard for doors, 1" plywood for shelves and 1/2" plywood or 1/4" MDF for backs, unless otherwise detailed.
  - c. Edges: Edge-band doors, drawer fronts and other exposed edges, including shelves, with machine applied 3mm PVC.
5. Drawers:
  - a. Sides, back and sub front: Minimum 1.2" thick particleboard, laminated with Thermally Fused Melamine doweled and glued into sides. Top edge banded with 1mm PVC.
  - b. Drawer bottom: Minimum 1/2" thick particle board laminate with Thermally Fused Melamine, screwed directly to the bottom edges of drawer box.
  - c. Drawer fronts. 3/4" thick particle board. VGS laminate exterior , balanced with high pressure cabinet liner CLS.
6. Cabinet Shelves: Design for load of 15 psf with deflection limited to 1/180.
7. Shelf Supports: Provide holes for shelf cleats to be adjusted up or down 3" from indicated elevation, in 1-1/2" increments, using metal shelf cleats.
8. Loose Joints: Make with rail bolts that can be pulled up tight to form perfectly flush joints.

## 2.10 FINISHING

- A. Backprime woodwork on surfaces concealed after installation, using oil-based wood primer paint.

## 2.11 WOOD BLOCKING AND NAILERS

- A. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- B. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work

## 2.12 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPAC U1; Use Category UC2 for interior construction. Use Category UC3b for exterior construction.
  1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.



2. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
  3. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
  4. Application: Treat all rough carpentry unless otherwise indicated.
- B. Fire-Retardant Treatment: Furnish fire-retardant treated wood (FRTW) framing, blocking, nailers and plywood where indicated on Drawings and where wood is required in fire-rated assemblies including roof assemblies. Treat with Koppers' "Non-Com Fireprotective," Hickson Corp's "Dricon," or equal chemicals bearing a National Evaluation Services Report. The treatment shall provide a UL fire hazard classification of 25 or less for both flame spread and fuel contributed:
1. Treat lumber with non-corrosive AWWA C20 type free of halogens, sulfates and ammonium phosphate per FR-1 of AWWA Standard P17
  2. Treat plywood with non-corrosive AWWA C27 type free of halogens, sulfates and ammonium phosphate per FR-1 of AWWA Standard P17
  3. After pressure treatment, kiln dry the treated lumber to a maximum moisture content of 19%. Plywood shall be kiln dried to a maximum moisture content of 15%.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Wood Blocking/Nailer:
1. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
  2. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
  3. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.
- B. Flush Wood Door and Finish Hardware:
1. Install flush wood door on hollow metal door frame.
  2. Install finish hardware on flush wood door and attach to hollow metal door frame.
- C. General:
1. Setting: Secure work to grounds and blocking as required, holding to correct surfaces, lines and levels. Make finished work flat, plumb, and true. Install items tight to adjoining surfaces except as approved otherwise. Cope and scribe for tight fits.
  2. Fastening: Conceal fastenings; where not possible, locate them in inconspicuous places. Where nailing is permitted through woodwork face, conceal nail heads. Do not nail adjacent woodwork to paneling.

3. Loose Joints: Locate loose joints to render them as inconspicuous as possible in finish work. Make joints in interior work with rail bolts that can be pulled up tight to form perfectly flush joints.
4. Expansion Joints: Install joints to permit sections to expand and contract without buckling, warping or causing other conditions that will detract from appearance and durability.
5. Miter external corner of flat horizontal members; house internal corners. Miter external corners of molded members; cope internal corners. Glue mitered corners; secure with corrugated metal fasteners.
6. At substrate irregularities apply colored sealant at such spaces and tool sealant to a straight line along millwork edge.
7. Thoroughly sand finished wood items smooth. Touch up edges and make smooth.
8. Coat cut surfaces of preservative treated wood after cutting, with a heavy brush coating of the same preservative

D. Cabinetwork:

1. Install cabinetwork and wall caps in a manner consistent with the specified quality grade, plumb, level, true and straight with no distortions.
2. Secure wall cabinets only to masonry or solid wood blocking. Anchor with concealed fasteners of the kinds recommended by the cabinet manufacturer to accommodate maximum loads; place anchors in the cabinet manufacturer's recommended locations/patterns.
3. Scribe and cut for accurate fit to other finished work. Permanently fix cabinet and counter bases to floor using appropriate concealed angles and anchorages.
4. Carefully scribe cabinetwork set against other building materials, leaving gaps of 1/32" maximum.
5. Install and adjust cabinet hardware to correct operation.
6. Cutouts: Provide cutouts for conduits and other fixtures and fitments. Verify locations, shapes and sizes of cutouts from site measured dimensions.
7. Coordinate installation of cabinetwork with other cabinetwork furnished and installed under other Sections of the Specifications.

E. Tackboard Panels: Fixing into Place: Securely fasten to cabinetry.

### 3.2 FINISH HARDWARE FOR DOORS

- A. Receive, store, protect and install finish hardware for wood and hollow metal doors on entire project as furnished by finish hardware supplier under Section 087100 - Finish Hardware. Install according to requirements specified in Section 087100.
- B. Adjust, and protect from injury all installed hardware. Cover door knobs and levers with heavy cloth until project acceptance.
- C. Deliver keys to Owner at completion and acceptance of work.

### 3.3 ADJUST AND CLEAN

- A. Repair damaged or defective work to the satisfaction of the Architect.
- B. Adjust and lubricate hardware for proper operation.
- C. Clean exposed interior surfaces

### 3.4 PROTECTION

- A. Protect installed finish carpentry from damage by other trades until Owner's acceptance of the work.

END OF SECTION 062000



**DIVISION 07 – THERMAL & MOISTURE PROTECTION**

**SECTION 072100**  
**BUILDING INSULATION**

**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. Batt wall insulation.
- B. Related Requirements:
  - 1. Section 033000 "Cast-In-Place Concrete" for perimeter insulation.
  - 2. Section 054000 "Cold Formed Metal Framing" for metal framing.

**1.3 SUBMITTALS**

- A. Process all submittals per requirements in Section 013300 "Submittal Procedures".
- B. Manufacturer's Data: Submit 2 copies of manufacturer's specifications and installation instructions for each type of insulation required.

**1.4 QUALITY ASSURANCE**

- A. The application of all insulations shall be in strict accordance with the directions and specifications of the manufacturer and shall be performed by an Installer approved by the manufacturer.
- B. Thermal Factors:
  - 1. Thermal Conductivity (k), Thermal Conductance (C) and Thermal Resistance (R) factors used in these specifications shall be for aged insulation effectiveness as listed in the latest edition of ASHRAE's Handbook of Fundamentals, and the Annual Book of ASTM Standards.
  - 2. Installed insulation thickness shall be adjusted to meet these minimum requirements.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. Batt Insulation:

1. Acceptable Manufacturers:
  - a. Owens-Corning.
  - b. Guardian Fiberglass.
  - c. CertainTeed.
  - d. USG.
  - e. Johns Manville.
2. Glass or other inorganic fibers and resinous binders formed into unfaced flexible blankets of thicknesses indicated conforming to ASTM C 665, Type I, with density not less than 0.5 pcf. Thickness as noted on drawings.

### 2.2 MISCELLANEOUS MATERIALS

- #### A. Mechanical Anchors:
- Type and size shown or, if not shown, as recommended by the insulation manufacturer for the type of application shown and condition of substrate including insulation batt supports.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- #### A.
- Installer shall examine the areas and conditions under which the work is to be installed. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work.
- #### B.
- Do not proceed with the work until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

#### A. General:

1. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
2. Extend insulation full thickness shown over entire surface to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation.
3. Apply a single layer of insulation of the required thickness unless otherwise shown or required to make up the total thickness.

#### B. Batt Insulation.

1. Do not obstruct ventilation spaces. Provide batts of appropriate width to fit in spaces tightly.
2. Insulation shall fill all voids as shown on drawings.
3. Penetrations where ducts or structural framing cut insulation shall be stuffed all around with insulation

### 3.3 CLEANUP

- A. Remove all scraps of insulation and dispose of properly.

END OF SECTION 072100





**FLUID APPLIED MEMBRANE AIR BARRIERS**

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. Fluid-applied, vapor-retarding membrane air barriers.
- B. Related Requirements:
  - 1. Section 042000 "Unit Masonry" for CMU substrate.
  - 2. Section 061000 "Carpentry Work" for wall sheathings and weather barriers

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.

- B. Shop Drawings: For air-barrier assemblies.
  - 1. Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
  - 2. Include details of interfaces with other materials that form part of air barrier.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer. Include list of ABAA-certified installers and supervisors employed by the Installer, who work on Project.
- B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
  - 1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.
- B. Mockups: Build mockups to set quality standards for materials and execution.
  - 1. Build integrated mockups of exterior wall assembly as shown on Drawings, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.
    - a. Coordinate construction of mockups to permit inspection by Owner's testing agency of air barrier before external insulation and cladding are installed.
    - b. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
    - c. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
  - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

## 1.9 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.
  - 1. Protect substrates from environmental conditions that affect air-barrier performance.
  - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa), when tested according to ASTM E 283 or ASTM E 2357.

### 2.3 VAPOR-RETARDING MEMBRANE AIR BARRIER

- A. Fluid-Applied, Vapor-Retarding Membrane Air Barrier: Elastomeric, modified bituminous membrane.
  - 1. Elastomeric, Modified Bituminous Membrane:
    - a. Barriseal S by Carlisle Coatings & Waterproofing Inc.
    - b. Air-Bloc 06 WB by Henry Company.
    - c. Textroflash Liquid by Holmann & Barnard, Inc.
    - d. Air-Shield LM by W.R. Meadows.
    - e. ExoAir 120SP/R by Tremco Inc.

2. Physical and Performance Properties:

- a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
- b. Vapor Permeance: Maximum 0.1 perm (5.8 ng/Pa x s x sq. m); ASTM E 96/E 96M.
- c. Ultimate Elongation: Minimum 500 percent; ASTM D 412, Die C.

2.4 ACCESSORY MATERIALS

- A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.
- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.
- C. Counterflashing Strip: Modified bituminous, 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 32 mils (0.8 mm) of rubberized asphalt laminated to an 8-mil- (0.2-mm-) thick, cross-laminated polyethylene film with release liner backing.
- D. Butyl Strip: Vapor retarding, 30 to 40 mils (0.76 to 1.0 mm) thick, self-adhering; polyethylene-film-reinforced top surface laminated to layer of butyl adhesive with release liner backing.
- E. Modified Bituminous Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.
- F. Joint Reinforcing Strip: Air-barrier manufacturer's glass-fiber-mesh tape.
- G. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- H. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- I. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch (0.5 mm) thick, and Series 300 stainless-steel fasteners.
- J. Modified Bituminous Transition Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.
- K. Adhesive-Coated Transition Strip: Vapor-permeable, 17-mil- (0.43-mm-) thick, self-adhering strip consisting of an adhesive coating over a permeable laminate with a permeance value of 37 perms (2145 ng/Pa x s x sq. m).
- L. Elastomeric Flashing Sheet: ASTM D 2000, minimum 50- to 65-mil- (1.3- to 1.6-mm-) thick, cured sheet neoprene with manufacturer-recommended contact adhesives and lap sealant with stainless-steel termination bars and fasteners.

- M. Preformed Silicone-Sealant Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.
  - 1. Product: Subject to compliance with requirements, provide one of the following:
    - a. 123 Silicone Seal by Dow Corning Corp.
    - b. US11000 UltraSpan by Momentive Performance Materials.
    - c. Sil-Span by Pecora Corp.
    - d. Spectrem Simple Seal by Tremco Inc.
- N. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 079200 "Joint Sealants."
- O. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
  - 2. Verify that concrete has cured and aged for minimum time period recommended by air-barrier manufacturer.
  - 3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
  - 4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

### 3.3 JOINT TREATMENT

- A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air-barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.
  - 1. Prime substrate and apply a single thickness of air-barrier manufacturer's recommended preparation coat extending a minimum of 3 inches (75 mm) along each side of joints and cracks. Apply a double thickness of fluid air-barrier material and embed a joint reinforcing strip in preparation coat.

### 3.4 TRANSITION STRIP INSTALLATION

- A. General: Install strips, transition strips, and accessory materials according to air-barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
  - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
  - 2. Install modified bituminous strip on roofing membrane or base flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by fluid air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- C. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- E. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

- F. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply modified bituminous transition strip, adhesive-coated transition strip, elastomeric flashing sheet or preformed silicone-sealant extrusion so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.
  - 1. Modified Bituminous Transition Strip: Roll firmly to enhance adhesion.
  - 2. Adhesive-Coated Transition Strip: Roll firmly to enhance adhesion.
  - 3. Elastomeric Flashing Sheet: Apply adhesive to wall, frame, and flashing sheet. Install flashing sheet and termination bars, fastened at 6 inches (150 mm) o.c. Apply lap sealant over exposed edges and on cavity side of flashing sheet.
  - 4. Preformed Silicone-Sealant Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.
- G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- H. Seal top of through-wall flashings to air barrier with an additional 6-inch- (150-mm-) wide, modified bituminous or counterflashing strip.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction.

### 3.5 FLUID AIR-BARRIER MEMBRANE INSTALLATION

- A. General: Apply fluid air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions. Apply fluid air-barrier material within manufacturer's recommended application temperature ranges.
  - 1. Apply primer to substrates at required rate and allow it to dry.
  - 2. Limit priming to areas that will be covered by fluid air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- B. Membrane Air Barriers: Apply a continuous unbroken air-barrier membrane to substrates according to the following thickness. Apply air-barrier membrane in full contact around protrusions such as masonry ties.
  - 1. Vapor-Retarding Membrane Air Barrier: Total dry film thickness as recommended in writing by manufacturer to meet performance requirements, but not less than 40-mil (1.0-mm) dry film thickness, applied in two equal coats.
- C. Apply strip and transition strip a minimum of 1 inch (25 mm) onto cured air-barrier material] or strip and transition strip over cured air-barrier material overlapping 3 inches (75 mm) onto each surface according to air-barrier manufacturer's written instructions.
- D. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.

- E. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.
- F. Remove masking materials after installation.

### 3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections if they require.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
  - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
  - 2. Continuous structural support of air-barrier system has been provided.
  - 3. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
  - 4. Site conditions for application temperature and dryness of substrates have been maintained.
  - 5. Maximum exposure time of materials to UV deterioration has not been exceeded.
  - 6. Surfaces have been primed, if applicable.
  - 7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
  - 8. Termination mastic has been applied on cut edges.
  - 9. Strips and transition strips have been firmly adhered to substrate.
  - 10. Compatible materials have been used.
  - 11. Transitions at changes in direction and structural support at gaps have been provided.
  - 12. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
  - 13. All penetrations have been sealed.
- C. Tests: As determined by Owner's testing agency.
- D. Air barriers will be considered defective if they do not pass tests and inspections.
  - 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
  - 2. Remove and replace deficient air-barrier components for retesting as specified above.
- E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.



### 3.7 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
  - 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.
  - 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION 072726



**DIVISION 07 – THERMAL & MOISTURE PROTECTION**

**SECTION 074213**  
**FORMED METAL WALL PANELS**

**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. Exterior metal wall panel system for canopies.
- B. Related Requirements:
  - 1. Section 051200 "Structural steel Framing" for structural framing.
  - 2. Section 054000 "Cold Formed Metal Framing" for metal stud framing.
  - 3. Section 061000 "Carpentry Work" for Canopy/Fascia sheathing and weather barrier.

**1.3 SYSTEM DESCRIPTION**

- A. Panel's exposed finishes shall perform according to AAMA 2605-98; exposed anodized aluminum according to AAMA 611-98.
- B. Panel composite assembly shall conform to ASTM E84, Flame Spread Resistance, Class A.
- C. Panel composite assembly shall pass Modified ASTM E108, External Flame Resistance.
- D. Panel composite assembly shall pass UBC 26-3, Fire Standard For Interior Applications.
- E. Panel bond integrity shall have a minimum peel strength of 34.5 in-lbs/in when tested according to ASTM D1781.
- F. Design wall system to withstand a positive and negative windload pressure acting inward and outward normal to the plane of the wall to meet the requirements of the 2015 International Building Code.
- G. Make adequate provisions in the wall system for thermal expansion and contraction of the component parts and fastening of the system to prevent harmful damage caused by buckling, opening of joints, contraction and expansion due to accumulation of dead loads and variations of live loads, in accordance with ASTM E72, Strength Tests For Panels For Building Construction.

- H. Water Leakage: No water infiltration into the panel system under static pressure when tested in accordance with ASTM E331 at a differential of 10% of inward acting design load, 6.24 psf (.299 kPa) minimum, after 15 minutes.
- I. Air Leakage: Not more than 0.06 (cfm)/sf of wall area (.003 (L/s) m<sup>2</sup>), when tested at 1.57 psf (.075 kPa) in accordance with ASTM E283.

#### 1.4 QUALITY ASSURANCE

- A. Take field measurements prior to preparation of shop drawings and fabrication, where possible. Take measurements in time, so as to avoid delaying job progress. Allow for trimming and fitting.
- B. Panel Manufacturer: Manufacturer shall have a minimum of ten (10) years experience in the manufacture of ACM/MCM and have ISO 9001:2000 Certification.
- C. Panel Installers: Installer shall be experienced in performing work of this section and be specialized in the installation of similar work required on this project.
- D. Field Measurements: When possible, measurements should be taken prior to the completion of shop manufacturing and assembly.
- E. Pre-Installation Meetings: Conduct pre-installation meetings to verify project requirements, substrate condition, installation instructions and warranty requirements.
- F. Mock Ups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
  - 1. Build mock up of typical metal composite material panel assembly as shown on Drawings, including corner, soffits, supports, attachments and accessories.
- G. Source Limitations:
  - 1. Obtain each type of wall panel from single source from single manufacture.
  - 2. Installer: Pre-Qualified Company specializing in performing the work of this Section shall install the system in strict compliance with the written manufacturer's instruction.
- H. References:
  - 1. American Society for Testing and Materials (ASTM):
    - a. ASTM E84: Surface Burning Characteristics.
    - b. ASTM D1781: Climbing Drum Peel for Adhesives.
    - c. ASTM E108 (Modified): Standard Test Methods for Fire Tests of Roof Coverings.
    - d. ASTM E72: Strength Tests for Panels for Building Construction.
    - e. ASTM E331: Test for Water Penetration of Exterior Walls by Uniform Static Air Pressure Difference.
    - f. ASTM E283: Test Method for Rate of Air Leakage through Exterior Walls

2. Architectural Aluminum Manufacturers' Association (AAMA):
  - a. AAMA 2605-98: Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
  - b. AAMA 611-98: Voluntary Specification for Anodized Architectural Aluminum.
3. UBC26-3: Room Fire Test Standard for Interior of Foam Plastic Systems.

#### 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal wall panel and accessory.
- B. Shop Drawings:
  1. Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, corners, and accessories; and special details. Distinguish among factory, shop, and field-assembled work.
  2. Coordination Drawings: Elevations, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
    - a. Metal wall panels.
    - b. Wall-mounted items.
    - c. Penetrations of wall by utilities.
- C. Samples: Samples for Verification: For type of exposed finish required, prepared on 6" x 6" sample of actual material.
- D. Maintenance Data: For metal wall panels to include in maintenance manuals.
- E. Preconstruction field adhesion test reports.
- F. Warranties: Sample of Manufacturers standard warranty.

#### 1.6 WARRANTY

- A. Manufacturer's Warranty: Furnish panel manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not a limitation of other rights Owner may have under the Contract Documents.
- B. Panel Lamination Warranty: Five (5) years commencing on Date of Substantial Completion.
- C. Installing Contractor shall warranty the system for 2 years from substantial completion.
- D. Finish Warranty: Kynar 500®: Twenty (20) years.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal wall panels, and other manufactured items so as not to be damaged or deformed. Package panels for protection during transportation and handling.
- B. Store and handle in strict compliance with manufacturers instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.
- C. Store covered with suitable weather tight and ventilated covering. Store panels to ensure dryness, with positive slope for drainage of water. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE TYPES & MANUFACTURERS

- A. Metal Composite Material Wall Panel Systems: Provide factory-formed and assembled, metal composite material wall panels fabricated from two metal facings that are bonded to a solid, extruded thermoset Phenolic Resin core; formed into profile for installation method indicated. Include attachment assembly components, panel stiffeners and accessories required for a watertight condition. Basis of Design - "Envelope 2000 Reveal (RV) System" by Citadel or equal by Alucobond, Reynobond, or Formabond Wall System. Alucoil, and Vitrabond Composite Panel are acceptable manufacturers as long as they are installed with the same type of extrusions and installation methods as the Basis of Design.

#### 1. Materials:

##### a. Panel Composition:

- 1) Face Skin: .024" (minimum) prefinished smooth aluminum.
- 2) Core: .105" thermoset phenolic resin.
- 3) Back Skin: .010" primed smooth aluminum backer.
- 4) Panel thickness: 1/8"

##### b. Panel Tolerances:

- 1) Thickness:  $\pm 1/32$ ".
- 2) Length and Width: +0, -1/16".
- 3) Squareness: 1/64" per lineal foot.

##### c. Attachment System: R System.

##### d. Finish: Exposed finish of Kynar 500 for panels, trims and reveals.

- 1) Color as selected by Architect.

##### e. Accessories:

- 1) Fasteners and moldings as required for panel system's design by panel system manufacturer. Fasteners shall be coated or stainless steel.
- 2) Weather Seals: Shall be Tremco® Spectrem® 2 or Dow Corning 795™, applied per the sealant manufacturer's instructions.

## 2.2 FABRICATION

- A. Panels shall be factory fabricated and finished by manufacturer. Comply with indicated profiles and with dimensions as detailed and noted on drawings.
- B. Form exposed work true to line and level, with accurate angles and surfaces and straight, sharp smooth edges.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine and verify substrate surfaces to receive composite metal panel system and associated work and condition which work will be installed.
- B. Maximum deviation from vertical and horizontal alignment of substrate shall be no more than 1/4" in 20'-0".
- C. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer. Starting work within a particular area will be construed as installer's acceptance of surface conditions.

### 3.2 COORDINATION

- A. Coordinate with other trades for any items which may be attached to or require penetrations to the panel.

### 3.3 INSTALLATION

- A. Erect panels level and true to intended plane.
- B. Anchor panels securely in place in accordance with manufacturer's/fabricator's approved Shop Drawings.
- C. Maximum deviation from vertical and horizontal alignment of erected panels shall be no more than 1/4" in 20'-0".
- D. Maximum deviation in panel flatness shall be 0.6% of the assembled units.
- E. Conform to panel manufacturer's instructions for attachment systems.
- F. Weather seal all joints as required using methods and materials as recommended by the panel manufacturer/fabricator.

### 3.4 CLEANING/REPAIR/REPLACEMENTS AND PROTECTION

- A. Weather seal all joints as required using methods and materials as recommended by the panel manufacturer/fabricator.
- B. Repair or replace damaged installed products.
- C. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.
- D. Remove and legally dispose of construction debris from project site.

END OF SECTION 079200



**DIVISION 7 – THERMAL & MOISTURE PROTECTION**

**SECTION 075320**  
**ADHERED TPO ROOFING**

**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. Fully adhered TPO sheet roofing systems.
  - 2. Board insulation.
  - 3. Membrane roof flashings, base flashings and parapet flashings.
  - 4. Elastomeric flashing boots at pipe penetrations.
  - 5. Fasteners and adhesives.
  - 6. Sealants.
  - 7. Walkway pads.
- B. Related Work Specified In Other Sections:
  - 1. Section 013300 "Submittal Procedures" for submittal of required items.
  - 2. Section 076200 "Sheet Metal Work" for new sheet metal work and roof trim.

**1.3 QUALITY ASSURANCE**

- A. Roofing Contractor: Illinois licensed, specializing for at least 5 years in the type of membrane system involved, who is approved by Architect and is certified/licensed by new roofing membrane system producer and who can furnish for this installation a foreman factory trained by the roof membrane system producer.
- B. Source of Supply: Membrane system materials shall be obtained from a single source of supply except as authorized otherwise by membrane producer.
- C. Standards of Installation: All components of roof system shall be furnished and installed to meet the wind 72 mph wind warranty.
- D. Scheduling and Coordination:
  - 1. Coordinate roofing installation with mechanical and electrical work associated with roof penetrations.
  - 2. No phased construction will be considered or approved.
- E. Wet and Damaged Materials: Shall not be installed.

#### 1.4 SUBMITTALS

- A. Process all submittals as required in Section 01300 – Submittals.
- B. Product Data: Submit 3 copies of roofing materials producer's specifications, material characteristics and installation instructions for each product required including fasteners.
- C. Shop Drawings: Indicate:
  - 1. Outline of roof and dimensions.
  - 2. Typical and special details for flashings, roof curbs, penetrations, perimeter conditions, termination details, etc. Reference the locations of details on the roof outline.
  - 3. Number and mark of each factory prepared roofing sheet and flashing.
  - 4. Layout of tapered insulation saddle areas.
  - 5. Provide fastener locations and spacing for insulation installation.

#### 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Packaging: Deliver materials to the job site in their original containers or packages, sealed, with legible labels intact, brand name, lot number, warning labels and reference standards clearly shown.
- B. Temperatures Prior to Use: Store materials in the dry and in accordance with membrane producer's instructions. Other than roof membrane, all materials furnished by membrane producer shall be stored between 60°F and 80°F. If exposed to lower temperatures, restore to 60 - 80°F prior to use.
- C. Warped or Broken Insulation Boards: Shall be removed from site.

#### 1.6 JOB CONDITIONS

- A. Ambient Conditions: Do not apply adhesives below adhesive manufacturers' recommended ambient temperature ranges.
- B. Cold Weather: Follow membrane producer's special recommendations when cold weather retards free flow of adhesives and sealants. Do not apply adhesives below adhesive manufacturers' recommended ambient temperature ranges.
- C. Electrical Power: Furnish power for heat welders by way of portable generator(s) producing at least 30 amps per welder supplied or furnish power to 220V heat welders by way of #10 x 3 or greater power cords and boost the power with a step-up transformer when cord length exceeds 150 feet.
- D. Fire Prevention: Take every precaution to prevent fire.
  - 1. Maintain at least 2 portable fire extinguishers, rated 10-B:C-20 pounds, near area where adhesives are being used and train applicators in their proper use.
  - 2. Do not use open flames to heat adhesives. Allow solvents to air-dry.
  - 3. Use only grounded spray equipment.
- E. Coordinate with Owner to shut off or block vents which may allow solvents or adhesives vapors to be drawn inside the building.

## 1.7 WARRANTIES

- A. New Roofing: Shall be provided with a non-prorated, No-Dollar-Limit, full system warranty to Owner, including tapered insulation saddles, against leaks or defects of any kind due to faulty materials or workmanship, and to sustain a 72 mph maximum wind speed as follows:
  - 1. Roofing membrane system producer's 20 year warranty for materials and workmanship.
  - 2. Roofing Contractor's 2 year warranty for workmanship.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. System Fire Rating: Provide a fire-resistant membrane and insulation assembly which has been tested and listed by Underwriter's Laboratories, Inc. (UL) as Class A, for the roof deck and slopes to be used on this project.
- B. System Wind Rating: Roof to be warranted for a 72 mph maximum wind speed.
- C. System Types: Reinforced TPO membrane fully adhered to the top layer of insulation units.
- D. Membrane Joint System: Membrane system producer's splice tape system.
- E. Approved Products: Use one of the following systems:
  - 1. TPO Membrane System:
    - a. Carlisle "Sure-Weld"
    - b. Firestone "Ultra Ply TPO".
    - c. Versico "VersiWeld."
- F. Membrane Joint System: Membrane system producer's splice tape system.

### 2.2 MATERIALS

- A. Membrane: TPO Roof Membrane: White, Thermoplastic Polyolefin, .060" (60 mil) thick, reinforced.
- B. Roof Insulation: High Density Rigid board insulation of foamed isocyanurate core with manufacturer's standard glass fiber reinforced mat facers or organic/inorganic facers integrally laminated to both sides; minimum R=5.7 per 1" of thickness: All insulation to be 25psi: Insulation furnished shall be as approved by membrane manufacturer.
  - 1. Thickness: As shown on the drawings.
  - 2. Tapered Insulation for Saddle & and Crickets: Isocyanurate units by same manufacturer as typical roof insulation; taper as required to achieve slopes indicated, or, if not indicated, not less than 1/4" per foot after roof deflection under full design load.

3. Tapered Insulation for Sump: Basis of Design "Hinged Target Sump" by Versico or equal, isocyanurate units by same manufacturer as typical roof insulation; with taper as required to achieve slopes indicated on drawings.
- C. Mechanical Anchors: Types recommended by roof system manufacturer including compression plates, for the kind of deck indicated and for wood nailers, featuring anti-corrosive materials and anti-blackout design. Anti-corrosion coating shall pass 30 cycles in Kesternich Cabinet DIN #50018 - 2 liter.
  - D. Base and Parapet Flashing: Same material as used for roof membrane.
  - E. Flashing To Cover Corners In Substrates: Same material as roof membrane; or roof membrane producer's unreinforced ethylene propylene-based flashing strips, .055" (55 mil) thick, of matching color.
  - F. Pipe Flashings: Premolded rubber boots approved by system producer for the membrane system, complete with stainless steel, screw tightened, pipe clamps.
  - G. Temporary Protection: Sheet polyethylene or fiber reinforced plastic. Provide weights to retain sheeting in position.
  - H. Auxiliary Materials: Prefabricated flashing units, bonding adhesives, sealants, splicing cements, mastics and other accessory materials shall be recommended by producer of roof membrane for the system installed.
  - I. Roof Expansion Joints: 2" to 3" diameter closed cell foam tube, laid over the expansion joint opening. In addition, the joint shall be filled with one of the following:
    1. Non-rigid closed cell plastic foam batts or tubes to a depth of 10".
    2. 3-1/2" thick glass fiber batts cut to nominal 10" width and suspended on a 10 mil polyethylene sheet, all covered with roof membrane.
  - J. Walkway Pads:
    1. Carlisle "Sure-Seal Roof Walkway Pads" 30" wide x 30" long, 3/8" thick.
    2. Firestone "Walkway Pad", 30" wide x 30" long, .54" thick.
    3. Or approved equal.

## PART 3 - EXECUTION

### 3.1 GENERAL:

- A. Install roofing membrane and flashing system in accordance with details, specifications and best practices recommended by membrane manufacturer.
  1. Follow all recommendations and adhere to all precautions specified by roofing manufacturer except that where conflict occurs between manufacturer's recommendations and these specifications, the more stringent requirement shall prevail.
  2. No wet or damaged materials shall be installed.

### 3.2 TEMPORARY PROTECTION

- A. Temporary Protective Sheeting: Provide over uncovered deck surfaces whenever precipitation is forecast.
  - 1. Retain sheeting in position with weights or temporary fasteners.
  - 2. Provide for surface drainage from sheeting to existing drainage facilities.
- B. Traffic: Do not permit traffic over unprotected or repaired deck surface.

### 3.3 PREPARATION

- A. Surfaces to Receive Roofing System: Prepare so that they will be clean, dry, and free of fins, sharp edges, loose, damaged and foreign materials, oil and grease.
- B. Cleaning: Sweep roof surface clean of loose matter.

### 3.4 INSPECTION FOR ROOFING

- A. Acceptance of Conditions Affecting Application: Proceeding with roof system application shall designate acceptance of conditions.

### 3.5 INSULATION INSTALLATION

- A. Roof Insulation Installation: (Verify installation with drawings)
  - 1. Install first layer and mechanically fasten to metal deck.
  - 2. Install and adhere second layer of rigid insulation to the first layer of insulation.
- C. Crickets and Saddles: Slopes shall be of 1/2 per foot. Assure positive drainage flow by installing crickets and saddles wherever flow to roof drain is obstructed, is inadequate or must be positively encouraged during storms to counter the forces of excessive runoff speeds or high winds. Take special care to correct flow patterns at rooftop equipment and where roofs have been modified. Fully adhere to insulation using adhesive as recommended by manufacturer.

### 3.6 ROOF MEMBRANE INSTALLATION

- A. General: Install roofing membrane and flashings in accordance with details, specifications and best practices recommended by membrane producer. Follow all recommendations and comply with all precautions specified by roofing producer except that where conflict occurs between producer's recommendations and these specifications, the more stringent requirement shall prevail.
  - 1. Direction of Membrane Placement: Orient the membrane so that rainwater runs over rather than along lap joints.
  - 2. Whole Sheets: Use whole, single sheets to the extent practicable.
- B. Membrane Installation: Lay membrane in full bed of contact adhesive for 100% adhesion.
  - 1. Relaxing: Roof membrane shall be set in place over substrate without stretching and allowed to relax 30 minutes before bonding.

2. Placement: Set sheets in final position, free of wrinkles and folds, overlapping adjacent sheets, with up-hill sheet on top of joint. Make overlap 5" on EPDM membranes. Then roll sheet back evenly onto itself. Sweep away bonding contaminants from mating surfaces using a stiff bristled broom.
3. Bonding Adhesive Application: Apply evenly to underside of sheet and to insulation at about the same time so as to allow matching drying times. Smooth out adhesive with nap roller. Hold bonding adhesive well back from edges to be spliced over other membrane.
4. Bonding to Insulation: When bonding adhesive is tacky and does not stick or string to touch of a dry finger, roll membrane into the coated substrate slowly and evenly so as not to cause wrinkles. Compress the bond with an approved roller. Do not bond surfaces before adhesive becomes tacky. Should adhesive lose its tackiness, reapply adhesive. Set the pace of work accordingly. When first half of a sheet is fully adhered, complete other half in same manner.
5. Contaminated Adhesive: Should adhesive become contaminated by dust, moisture, walking etc., re-apply adhesive, but only after contaminated adhesive is thoroughly dry, even if redoing entire field of adhesive is required. Remove contaminated adhesives when so recommended by membrane producer.

C. Lap Splices:

1. Cleaning: Sweep away excess talc and other bonding contaminants from mating surfaces using a stiff bristled broom.
2. Adhesive Application: Scrub on bonding adhesive to each surface to be mated, extending adhesive 1/2" to 3/4" beyond edge of the sheet that will be laid on top. Scrub harder where there is excess dusting agent or contamination. Time the application of adhesive to each surface so as to allow matching drying times when each side of splice tape is pressed into the adhesive.
3. Rolling: Roll the splice tape into the adhesive applied onto bottom sheet, leaving no edge of tape un-wet by the adhesive.
4. Trimming: Trim the top sheet as required to allow splice tape to be exposed 1/8" to 1/2" after top sheet is fixed.
5. Bonding: Fix the top sheet in place by allowing the sheet to carefully fall on to the freshly exposed top surface of the splice tape, making a joint free of wrinkles and fishmouths. Broom the entire length of the splice as the splice is made and then roll the splice tight with a silicone wheeled hand roller, working across the joint and then along its length.
6. Splices between Lengths of Splice Tape: Lap the splices at least 1" and cover such joints with a 6" x 6" patch of uncured membrane, sealed all around with lap edge sealant.
7. Sealing Exposed Scrim: Wherever the membrane reinforcement scrim is exposed, cover with continuous bead of lap edge sealant.
8. Sealant Application: Prime the surfaces before applying sealant and tool the sealant bead, as required by membrane manufacturer. Take caution to not disturb fresh lap sealant.

D. Edge Attachment: Mechanically attach edges of membrane all around roof edges and roof openings, anchoring into parapets and edge blocking, according to membrane producer's recommendations and approved details.

E. Flashing: Bond only to clean surfaces. Contour the membrane to fit substrate to which it is bonded so as not to allow bridging or gapping effect.

1. Roof Interruptions, Curbs and Edges: Flash with longest pieces practicable. Include intersections with other roofs. Terminate flashings a minimum of 8" above adjacent roof surface unless indicated otherwise.
2. Pipe Penetrations: Flash with prefabricated rubber boots. Seal the top of boots with stainless steel strap clamps and continuous bed of mastic sealant. Form all surfaces so as to provide positive drainage.
3. Pipe Penetrations: Seal according to Architect's approval using sealant pockets having proper metal flashings all around.
4. Base Flashings: Membrane flashings applied over upright surfaces shall be fully adhered to substrate, all across contact area, using techniques similar to those used to bond main roof membrane.
5. Joints In Membrane Flashings: Provide a minimum lap of 3" at joints and compress the bond with an approved roller. Round off membrane corners. Apply additional patches of flashing membrane over joints and seal all around edges, according to roof membrane system producer's recommendations.
6. Flashing Over Fasteners: Cover the fasteners with flashing membrane, providing a minimum lap of 3" beyond washers.

F. Expansion Joints:

1. Fill expansion voids with expansion joint insulation down to the level of the roof deck. Fill voids completely. Do not use any rigid materials.
  - a. Wrap a vapor barrier membrane around fibrous insulations and seal joints between vapor membrane sections with vapor resistant construction tape and then seal the joint between vapor barrier and curb with approved mastic.
2. Top the expansion joint with an approved foam tube and secure the tube against dislodgement with strips of flashing membrane or as otherwise approved.

G. Temporary Closures: Install as needed to prevent water from flowing beneath roof system during inclement weather.

1. Extent: The roof membrane shall be extended at least 2 feet past edge of roof insulation and a continuous layer of sealer applied onto substrate 12" wide along the membrane edge.
2. Sealing Edge: Firmly embed roof membrane into sealer and provide continuous pressure over the length of the cut-off, using lumber and other ballast, so as to prevent blow-off.

I. Walkway Pads:

1. Walkway pads shall be installed over existing roof system. Remove existing ballast and clean existing roof membrane for required adhesives.

J. Repairs:

1. Wrinkles: When within 18" of a splice or running towards a splice or positioned to interrupt proper drainage, cut out the wrinkle and repair with unspliced roof membrane to at least 3" beyond the wrinkle.
2. Cuts and Punctures: Patch over with roof membrane to at least 3" beyond the break.

3.7 INSTALLATION OF SHEET METAL WORK

- A. Coordinate membrane installation with Section 076200 – Sheet Metal Work Contractor.
- 3.8 CLEAN UP

- A. Smears and Droppings: Clean from all non-roofing surfaces.
- B. Rubble, Debris, and Excess Materials: Remove roof construction rubble, debris, and excess roofing materials and containers.

END OF SECTION 075323



**DIVISION 7 – THERMAL & MOISTURE PROTECTION**

**SECTION 076200**  
**SHEET METAL WORK**

**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. Flashings and sheet metal work.
- 2. Coping, fascia and metal edge.
- 3. Overflow Scuppers.

B. Related Requirements:

- 1. Section 042000 "Unit Masonry" for wall flashings.
- 2. Section 062000 "Carpentry Work" for treated blocking, nailers and plywood backer panels.

**1.3 COORDINATION**

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

**1.4 ACTION SUBMITTALS**

A. Product Data: For each type of product.

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

- 1. Include plans, elevations, sections, and attachment details.
- 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop and field-assembled work.
- 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
- 4. Include details for forming, including profiles, shapes, seams, and dimensions.
- 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
- 6. Include details of termination points and assemblies.

7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
  8. Include details of special conditions.
  9. Include details of connections to adjoining work.
  10. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- D. Samples for Verification: For each type of exposed finish.
1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
  2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
  3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
- E. Certifications: Submit roof membrane producer's certification that metal items to be furnished for roofing are acceptable for inclusion in roof system producer's warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing panels and trim, and its accessories, to include in maintenance manuals.

#### 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Applicator: A company specializing in sheet metal flashing work and approved by membrane roofing subcontractor; having 10 years' minimum experience.
- C. Provide water and weather-tight work, with surfaces free from waves and buckles, and seams avoided as much as possible.
- D. Comply with applicable recommendations and details of the latest editions of the SMACNA Architectural Sheet Metal Manual and the NRCA Roofing & Waterproofing Manual, including workmanship and installation.
- E. Coordination:
1. Coordinate fabrication and installation of metal roof flashings with roof membrane system installers so as to meet requirements of roof warranty (specified in roofing specifications Section).
  2. Coordinate metal flashings work with adjoining work for proper sequencing of each installation to ensure the best possible weather resistance and the protection of materials and finishes from damage.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver prefinished sheet metal components free of surface blemishes.
- B. Do not store sheet metal flashing, panels and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- C. Protect strippable protective covering on sheet metal flashing, panels and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

## 1.8 WARRANTY

- A. Sheet metal flashings incorporated into membrane roofing shall be compatible with the requirements of the roof system producer for inclusion into the roofing warranty.
- B. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing, panels and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing, panels and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing, and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

### 2.2 FABRICATED SHEET METAL COMPONENTS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

- B. Counterflashings: Made from 0.050" aluminum, with 3" end laps. Corners to be mitered and solder sealed. Fabricate with punched nail hole slots 12" o.c. to allow for expansion.
- C. Coping Metal Edge: Made from 0.050" aluminum, with corners formed by butting adjacent fascia pieces over backer splice unit that has been mitered and welded.
- D. Overflows: Made from .050" aluminum with Kynar coating; color as selected by Architect from manufacturer's standard range of colors. Include all accessories required.
- E. Finish: All fabricated sheet metal components shall have factory applied fluoropolymer coating containing a minimum of 70%, by weight, Kynar 500, Kynar 500 VLD or Hylar 5000 resin; Color as selected by Architect.

## 2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Flashing Cement: Asphalt mastic cement formulated for weathering and flow resistance, meeting requirements of Fed. Spec. SS-C-153.
- C. Adhesives for sheet metal flashings in contact with EPDM roofing shall be type recommended by flashing sheet manufacturer and approved by roofing system manufacturer to provide a waterproof/weather-resistant seaming and adhesive application compatible with roofing system materials.
- D. Dissimilar Metal Protection: Bituminous coating conforming to Fed. Spec. TT-C-494 or SSPC-Paint 12, or plastic separators, or insulating tape, subject to Architect's approval.
  - 1. For metal flashing in contact with roofing, use separation materials or methods compatible with roofing system materials as approved by roofing system manufacturer.
- E. Sealant Tape for Surface Mounted Flashings: Protective Treatments, Inc., "Product #606 Architectural Sealant Tape," 3/16" x 3/4" minimum size.
- F. Sealant for Metal Flashing Joints: Use one of the following, color as best blends with color of flashing material:
  - 1. Dap, Inc. "Butyl - Flex".
  - 2. Pecora Corp. "BC 158".
  - 3. Protective Treatments, Inc. (PTI) "757 Butyl Sealant".
  - 4. Tremco "Butyl Sealant".
  - 5. Sonneborn Bldg. Products "Butakauk".
- G. Fasteners: Fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  - 1. For Fastening Aluminum Flashings: Aluminum or stainless steel nails with annular threads, of sufficient length to penetrate wood blocking at least 7/8".

2. For Cleats to Nailers: Use ring-shank or screw-shank nails long enough to penetrate the wood nailer at least 1-3/4" or use #8 screws long enough to penetrate the wood nailer 3/4".
3. For Exposed Fastening: Fasteners as specified above or screws, with soft neoprene washers.

## 2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
  1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  2. Obtain field measurements for accurate fit before shop fabrication.
  3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
  1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
  2. Use lapped expansion joints only where indicated on Drawings.
- C. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- F. Drip Edges: All exposed edges of flashing shall have 1/2" projecting hemmed edge.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

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

### 3.2 PREPARATION

- A. Coordinate with other trades to provide flashings, etc., to secure their work.
- B. Clean surfaces to be covered, removing dirt and other foreign matter.
- C. Flashings shall be installed to prevent galvanic action with dissimilar metals by priming with heavy coat of bituminous paint (min. 7.5 mil DFT).
- D. Prepare all surfaces where dissimilar metals meet, using dissimilar metal protection materials hereinbefore specified.

### 3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of welds, and sealant.
  2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
  4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
  5. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
  1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
  2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Cleats For Edgings: Install over a continuous bead of butyl sealant applied to the bottom of the vertical flange of the cleat. Install with annular threaded or ring-shank nails 16" o.c. When within 8 ft of outside corners, double the fasteners. Double-nail at ends of runs.

D. Metal Coping & Drip Edgings:

1. Install in coordination with roofing, as required to maintain roofing warranties.
2. Engage drip hem around the anchor cleat to the full depth of the drip hem.
3. Metal flanges under roof membranes shall be attached to blocking at 4" o.c., with nails placed 1" from back edge of roof flange.
4. Apply a continuous bead of sealant 1" from end of each section, and fasten cap to blocking with a screw midway between flashing sections.

E. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

F. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

G. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

H. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

### 3.4 CLEANING AND PROTECTION

A. Clean off excess sealants.

B. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

C. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200





**DIVISION 07 – THERMAL & MOISTURE PROTECTION**

**SECTION 078400**  
**FIRESTOPPING**

**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. Firestopping systems for the firestopping of top and ends of fire rated partitions and where elsewhere designated on drawings.
- B. Sealing of **ALL** sleeved and un-sleeved pipe, conduit, cable, cable tray, duct and similar penetrations through **ALL** rated walls and partitions.
- C. Related Requirements:
  - 1. Section 079200 "Joint Sealants" for miscellaneous sealant work.
- D. With respect to fire stopping of pipe, pipe sleeves and conduit penetrations, the requirements of this Section apply and are to cover fire stopping requirements specified in Mechanical and Electrical Divisions. Work of this Section shall be coordinated with Mechanical and Electrical contractors as required to assure compliance with the fire stopping requirements specified in Mechanical and Electrical Divisions.

**1.3 SUBMITTALS**

- A. Schedule of Applications: Submit 6 copies of a usage schedule showing what products will be used for which situations.
  - 1. Submit detailed drawings of all firestopping systems to be used, giving names of materials and means of installation. Indicate the appropriate UL or FM approval number with each drawing.
  - 2. On a plan drawing of the project, reduced in scale as convenient, indicate where each kind of firestopping system submitted will be located.
- B. Product Data: Provide data on characteristics, performance and limitation criteria of products.
  - 1. Include manufacturer's material safety data sheets (MSDS).
  - 2. Manufacturer's Installation Instructions: Include preparation and installation procedures required.

- C. Certificates.
  - 1. Manufacturer's Certification: Submit manufacturers' letters of certification verifying acceptability of proposed Fireproofing Installer.
  - 2. Verification of Installation: Contractor shall submit letter certifying that fire stopping has been installed complete and in accordance with all specifications.
- D. Sample Warranties: For manufacturer's warranties.

#### 1.4 QUALITY ASSURANCE

- A. Installer: Firestopping Installer shall complete the installations as specified and to the satisfaction of all authorized inspectors.
- B. Manufacturer's Representative: Each manufacturer furnishing materials for the work shall have an on-site representative to perform the following:
  - 1. Assist Installer with selection of correct products for the various conditions of installation.
  - 2. Train Installer's personnel in proper installation procedures, including quantities of materials necessary to meet the fire resistance ratings required.
  - 3. Verify throughout the course of the work that correct installation procedures are being used.
- C. Firestopping Systems' Performance Requirements:
  - 1. Fireproofing Resistance: As appropriate to the fire rating(s) noted on the Drawings, per ASTM E 814.
    - a. Flame and Temperature Ratings: As required by the pertinent building codes, according to test results produced in nationally accepted test agencies from tests conducted per ASTM E 814 or UL 1479. Flame (F) rating must be no less than the fire resistance rating of the assembly through which it is applied. Temperature (T) rating, when required by code authority, shall be measured under a positive pressure differential of at least .01" of water column.
  - 2. Expansion Joint Materials: Tested for F, T and L ratings per UL 2079 at full extension after 500 expansion/contraction cycles.
- D. Product Compatibility: In each type of firestopping system used, each component shall have been tested and approved for use with the other components installed.
- E. Verification of Compliance: The Contractor shall provide to the Architect, prior to final payment, a letter of certification verifying that all perimeters of fire resistance rated constructions as well as penetrations through fire resistance rated constructions were completed as required by Code and the requirements of this Section

#### 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, unopened packaging with intact labels identifying product, UL labels, lot number and use-by date.

- B. Store materials at site in one location, in original containers, under conditions recommended by manufacturer.
- C. No material shall be used which has exceeded its shelf life.

## 1.6 PROJECT CONDITIONS

- A. Install materials only under the conditions of temperature and humidity recommended by manufacturer of product to be installed.
- B. Coordinate with other trades as required to assure proper installation of their work and the firestopping work. Install firestopping at drywall penetrations before finishing is started on drywall joints.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE PRODUCTS

- A. Acceptable Manufacturers: Products shall be produced by one or more of the following manufacturers:
  - a. Sonneborn Div. of ChemRex Inc.
  - b. Hilti.
  - c. 3M Brand Products.
  - d. RectorSeal Metacaulk.
  - e. Tremco.
- 2. Acceptable Products: Use one of the following or similar produced by a manufacturer listed above:
  - a. Hilti "FS-One" sealant with matching backer, and Hilti "FS-Fire Block."
  - b. Sonneborn "NP2" sealant with BackerRod Mfg's "Ultra Block" fire blocking mat.

### 2.2 MATERIALS

- A. General: Use only UL listed materials complying with ASTM E 814 (UL 1479) or ASTM E 119 (UL 263) and appropriate to the kind of opening and kind of item penetrating the opening, as required to maintain the indicated fire rating of the construction assembly penetrated:
  - 1. Materials shall be VOC compliant.
  - 2. Materials shall be free of materials requiring hazardous waste disposal, including PCBs, lead and asbestos.
  - 3. For each kind of firestopping situation, use materials from only one manufacturer.
- B. Safing Insulation: Either unfaced mineral fiber OR ceramic fiber insulation, as required by system manufacturer
- C. Accessories: Furnish sleeves, confinement collars, dam material, primers, sealants and other placement and attachment accessories as recommended by manufacturer and as necessary to establish the required fire ratings

- D. Identification Labels: Plastic or plastic shielded paper, configured for permanent attachment and bearing the following information:
1. FIRESTOP SYSTEM - DO NOT DISTURB.
  2. (Manufacturer's Name).
  3. System Number \_\_\_\_\_.

## PART 3 - EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Verify that openings are ready to receive the work of this Section and that elements penetrating the floors, walls and partitions have been permanently affixed. All penetrations are to have sleeves, except as approved otherwise by Architect.
- B. Verify that pipe sleeves have been properly installed.
1. Pipes and conduits shall be sleeved with un-split Schedule 40 pipe solidly joined to masonry with mortar, to drywall with joint compound and to concrete with mortar.
  2. Pipe sleeves shall be sized to maintain a minimum gap of 1" all around the pipe or conduit (including any insulation on the pipe), irrespective of whether the pipe or conduit is aligned with the center of the sleeve or is off-center.
  3. The pipe sleeve's length shall be 1" longer than the thickness of the wall assembly, so that it shall extend out from each face of the wall or partition by 1/2".
  4. The pipe sleeve's length at floors shall be 2 1/2" longer than the thickness of the floor assembly, so that it shall extend 2" above the rough floor elevation and 1/2" below the bottom of the floor assembly.
- C. Verify that pipes are not insulated with any materials inappropriate to the rated fire stopping system.
- D. Should an area requiring firestopping be covered up with other construction or should other conditions unsatisfactory for a proper installation be found, such as lack of sleeves, report the conditions to Contractor for rectification, and send copy of report to Architect. Do not proceed with installation until unsatisfactory conditions have been corrected.
- E. Clean substrate surfaces of dirt, dust, grease, oil, loose material and other matter that might affect bond of firestopping material.
- F. Protect adjacent surfaces from damage due to material installation.

### 3.2 APPLICATION

- A. General:
1. Apply materials in accordance with manufacturer's instructions, in the same manner as was used to achieve the UL design listing.
  2. Apply firestopping materials to uniform densities and texture, in sufficient quantities to achieve required fire resistance rating. Keep exposed work neat.

3. Where additional layers of construction create voids in addition to the primary floor or partition, treat the extra voids the same as primary voids, assuring that fire, smoke and gases are restricted from flowing in any voids.
  4. Install retention dams as required. After curing of firestop materials, incombustible dams may be left in place; combustible dams shall be removed.
- B. Penetrations Through Fire Rated and Smoke Rated Interior Walls And Partitions:
1. Apply firestopping wherever a void has been made in a wall or partition for the penetration of pipes, conduit, wire, cables, ducts, sleeves, or other items which could allow passage of flame, smoke or gases in the event of a fire —whether that wall or partition is rated or not rated.
  2. Ensure that any voids between the sleeve and the surrounding construction are filled and firestopped to the same degree as voids within the sleeve.
- C. Tops Of Interior Walls And Partitions: At tops of masonry partitions and gypsum partitions, which are fire rated or smoke rated, create a fire and smoke barrier by installing firestopping between the top of the wall or partition and the deck above.
- D. Permanently affix adjacent to each installation in a fire-rated wall the label specified above, properly identifying the firestopping system installed.
- E. Correct any firestops that do not conform to the requirements specified, at no additional charge to the Owner

### 3.3 CLEANING, AND PROTECTION

- A. Clean firestopping materials from adjacent surfaces.
- B. General Contractor shall protect work of this Section from damage by other trades.

END OF SECTION 078400



**SECTION 079200**  
**JOINT SEALANTS**

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. Joint sealants for interior and exterior applications.
- B. Related Requirements:
  - 1. Section 084113 "Aluminum Framed Entrances" for perimeter sealing of aluminum frames to walls.
  - 2. Section 085113 "Aluminum Storefront Windows" for perimeter sealing of aluminum frames to walls

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish watertight and airtight continuous seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each type of joint sealant product.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint Sealant Schedule: Include the following information:
  - 1. Joint sealant application, joint location and designation.
  - 2. Joint sealant manufacture and product line.
  - 3. Joint sealant formulation.
  - 4. Joint sealant color.
- D. Product Test Reports.
- E. Preconstruction compatibility and adhesive test reports.
- F. Preconstruction field adhesion test reports.

- G. Field adhesion test reports.
- H. Warranties.

## 1.5 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site.

## 1.6 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MAUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of, the products listed herein.

### 2.2 JOINT SEALANTS

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated in accordance with 40 CFR 59, Part 59, Subpart D (EPA Method 24):
  - 1. Architectural sealants shall have a VOC content of 250 g/L or less.
  - 2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
  - 3. Sealants and sealant primers for porous substrates shall have a VOC content of 775 g/L or less.
- C. Liquid Applied Sealants: Sealants and sealant primers shall comply with ASTM C 920 and other requirements for each liquid applied joint sealant specified including those referencing ASTM C 920 classifications for type, grade, class and uses related to exposure and joint substrates.
  - 1. Suitability for Immersion in Liquids: Where sealants are indicated of Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing in accordance with ASTM C 1247. Liquid used for testing is deionized water unless otherwise indicated.
- D. Stain Test Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing in accordance with ASTM C 1248 and have not stained porous joint substrates indicated for the project.



- E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with CFR 177.2600.
- F. Colors of Exposed Joint Sealants: Custom color to match window frame color, except replace existing sealant at sills with color to match sill.

## 2.3 SEALANT TYPES

- A. Sealant for Interior Control Joints and Door frame Seals:
  - 1. Pecora “Dynaflex”
  - 2. Sika Chemical Co. “Sikaflex-1a”
  - 3. Sonneborn Div. of ChemRex Inc. “Sonolastic Ultra”
  - 4. Tremco “Vulkem 617”
- B. Sealant for Sink Surrounds and Other Interior Wet Areas:
  - 1. Pecora Corp. “AC-20 + Silicone”
  - 2. Sika Chemical Co. “Sikaflex-1a”
  - 3. Sonneborn Div. of ChemRex Inc. “Sonolastic OmniPlus”
  - 4. Tremco “Vulkem 116” or “227”
- C. Sealant for Joints in Floors: Polyurethane base, multi-component, chemical curing, self-leveling, Shore A hardness between 15 and 50; non-staining; non-bleeding:
  - 1. Sonneborn Div. of ChemRex Inc. “Sonolastic SL1” and “Sonolastic SL2”
  - 2. Tremco “Vulkem 45” or “245/255”
  - 3. H.S. Peterson “Isoflex”
- D. Sealant for Other Interior Uses: Acrylic base, single component, chemical curing, paintable, Shore A hardness of 55, maximum; non-staining; non-bleeding:
  - 1. Pecora Corp. “AC-20 + Silicone”
  - 2. Sonneborn Div. of ChemRex Inc. “Sonolastic Sonolac”
  - 3. Tremco “Tremflex 834”
- E. Sealant for General Exterior Use: Silicone base, single component, chemical curing; Shore A hardness between 15 and 50; non-staining; non-bleeding:
  - 1. Pecora “890 Architectural Silicone Sealant”
  - 2. Sonneborn Div. of ChemRex Inc. “Sonolastic Omniseal”
  - 3. Dow Corning “790 Building Sealant”
  - 4. Tremco “Spectrem 1”
- F. Lap Sealant for Gutters and Sheet Metal Flashing Joints: Use one of the following:
  - 1. Pecora Corp., “BC 158”
  - 2. Dap, Inc., “Butyl - Flex”
  - 3. Tremco “Butyl Sealant”

## 2.4 JOINT FILLER

- A. Joint Filler: Backer rod for elastomeric sealants. Extruded closed cell polyethylene foam or polyethylene jacketed polyurethane foam, non-bleeding, non-staining, oversized 30 to 50 percent; provide one of the following:
  - 1. Dow: Ethafoam.
  - 2. Meadows: backer Rod.
  - 3. Sonneborn: Sonofoam backer Rod.

## 2.5 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Non-staining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas and capable of remaining resilient at temperatures down to minimum 26 deg. F (minimum 32 deg. C). Provide product with low compression set of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## 2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- F. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

### 3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

**SECTION 084113**

**ALUMINUM FRAMED ENTRANCES**

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. Aluminum entrance and vestibule doors and frames.
  - 2. Seals around frame perimeters.
  - 3. Weatherstripping.
  - 4. Installation of hardware furnished for aluminum entrances by hardware supplier as specified in Section 087100 - Finish Hardware.
  - 5. Perimeter sealant installation in accordance with requirements of Section 079200 - Joint Sealants.
- B. Related Requirements:
  - 1. Section 042000 "Unit Masonry" for installing aluminum door frames into masonry walls.
  - 2. Section 079200 "Joint Sealants" for sealing at aluminum door frames
  - 3. Section 087100 "Finish Hardware" for new aluminum doors and frames finish hardware.
  - 4. Section 088000 "Glazing" for new glass.

1.3 QUALITY ASSURANCE

- A. Installer's Qualifications: Company specializing in installation of systems of the type specified for 5 years, and approved by system manufacturer.
- B. Fabrication Tolerances: Fabricate aluminum storefront in accordance with framing manufacturer's prescribed tolerances.
- C. Thermal Break Components: Manufactured to meet the following standards:
  - 1. AAMA QAG 1-98, "Quality Assurance Processing Guide for Poured and Debridged Polyurethane Thermal Barriers."
  - 2. AAMA TIR A8-90, "Structural Performance of Poured and Debridged Framing Systems."
  - 3. AAMA 505-98, "Dry Shrinkage and Composite Performance Thermal Cycling Test Procedure."

D. Coordination:

1. Installer of aluminum entrance doors and frames shall be responsible for installing each complete with glass and perimeter sealant.
2. Coordinate with Finish Hardware Supplier as required to assure proper fitting of hardware items furnished under Section 087100.
  - a. Hardware Installation: According to templates approved by hardware item manufacturers.
  - b. Hardware Templates: Report to Architect in writing should templates not be delivered by Hardware Supplier in sufficient time to meet construction schedules.
3. Glazing: Installer of aluminum entrance doors shall be responsible for installing them complete with glass.

1.4 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and finishes.

B. Shop Drawings: Show elevations and details, including gaskets, weatherstripping, methods of anchoring, type of alloy, finishes; size and thickness of individual parts, dissimilar metal protection.

1. Shop drawings for the systems shall bear the seal and signature of a Structural Engineer licensed in the State of Illinois and contain:
  - a. Anchor locations - If anchors other than thru-jamb type are used, contractor to provide required interior trim as required to conceal fasteners whether shown on the drawings or not.
  - b. Structural integrity.
  - c. Wind loading.
  - d. Structural loading.
  - e. All installations shall be based on the 2015 IBC.

C. Samples: Submit for Architect's review:

1. 2 samples 6" long of each color available for each type of glazing sealant and gasket exposed to view.
2. Full size samples of each framing system.

D. Certificates: Submit manufacturer's certification that Installer is approved by manufacturer.

1.5 PRODUCT STORAGE, AND HANDLING

A. Uncrate doors, frames and related accessories and store in strict compliance with the manufacturer's instructions. Remove all padding and packing in contact with aluminum immediately upon arrival in order to prevent staining.

## 1.6 WARRANTIES

- A. Manufacturer shall agree to repair or replace units whose components fail due to inferior materials or workmanship within 10 years of installation. Failures shall include but are not be limited to:
  - 1. Structural failures including excessive deflection, leakage or air infiltration.
  - 2. Failure of insulating glass, including interpane dusting or misting and internal dew point rising above -50°F.
- B. Warranty Period:
  - 1. Window Manufacturer: 10 years from date of Substantial Completion.
  - 2. Window Installer: 5 years from date of Substantial Completion.
  - 3. Finish: Manufacturer's standard warranty.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER AND TYPE

- A. Acceptable Products:
  - 1. Exterior Entrance Doors and Frames:
    - a. Thermally Broken Aluminum Door Frame: TriFab "VG 451T" as manufactured by Kawneer as the Basis-of-Design or comparable products by Efco, Tubelite, Manko or YKK AP or Owner Approved Equal.
      - 1) Frames shall have with a nominal profile of 2" x 4 1/2".
    - b. Non-Thermally Broken Aluminum Entrance Doors: Doors shall be heavy duty swing type, "Standard 500" (2" deep) as manufactured by Kawneer as the Basis-of-Design or comparable products by Efco, Tubelite, Manko or YKK AP.
    - c. Hardware and Lock Cylinders: As furnished under Section 087100 – Finish Hardware.
  - 2. Interior Vestibule Doors and Frames:
    - a. Aluminum Door Frame: TriFab "VG 451" as manufactured by Kawneer as the Basis-of-Design or comparable products by Efco, Tubelite, Manko or YKK AP or Owner Approved Equal.
      - 1) Frames shall have with a nominal profile of 1 3/4" x 4 1/2".
    - b. Aluminum Entrance Doors: Doors shall be heavy duty swing type, "Standard 500" (2" deep) as manufactured by Kawneer as the Basis-of-Design or comparable products by Efco, Tubelite, Manko or YKK AP.
      - 1) Door thickness of 2".
    - c. Hardware and Lock Cylinders: As furnished under Section 087100 – Finish Hardware.

## 2.2 MATERIALS AND CONSTRUCTION

### A. Aluminum (Framing and Components):

1. Material Standard: ASTM B 221; 6063-T6 alloy and temper.
2. Wall Thickness: minimum wall thickness of 3/16.”
3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.
4. Thermal Breaks: Manufacturer’s standard type. Poured-in-place polyurethane type shall have maximum tensile strength of 4,300 psi.

### B. Accessories:

1. Fasteners: Where exposed, shall be Stainless Steel.
2. Gaskets: Glazing gaskets shall be extruded EPDM rubber.
3. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
4. Dissimilar Metal Protection: Alkali resistant bituminous paint conforming to AN-P 31, plastic separators, insulating tapes or manufacturer’s standard, subject to Architect’s approval.

### C. Weatherstripping: Thermoplastic elastomer weatherstrip system on all sides of exterior doors and/or frames, meeting AAMA 702 requirements. Provide surface applied bottom weatherstrip with flexible blade gasket at bottoms of doors.

### D. Internal Joint Sealant: Polyisobutylene non-hardening thin-joint sealant “Presstite #579” or equal.

### E. Sealants: See Section 079200 - Joint Sealants.

### F. Glass: See Section 088000 - Glazing.

### G. Material Separation: Provide a coating or material between dissimilar materials as recommended by aluminum door manufacturer to protect against corrosion of aluminum materials.

## 2.3 FABRICATIONS

### A. Fabricate components per manufacturer's installation instructions and 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. Arrange fasteners and attachments to conceal from view.

## 2.4 FINISH

### A. Exposed Metal Surfaces: Natural Anodized Finish, AA-C22A41, Class 1 (min. 0.7 mils thickness and sealed), natural aluminum color.

### B. Unexposed metal surfaces may remain uncoated.



## 2.5 FABRICATION

- A. General: Fabricate and assemble in as large sections in shop as consistent with shipping and field requirements.
- B. Joints: Shall be flush, hairline. Field splices and joints between sections shall produce strength to resist misalignment and deformations imposed by handling and live loads. Keep fasteners concealed.
- C. Doors: Corners: Dual moment construction consisting of mechanical fastening using extruded aluminum channel clips and bolt fasteners and SIGMA deep penetration plug welds and fillet welds.
- D. Reinforce doors and frames for hardware with backing plates of non-magnetic steel or hot-dip galvanized steel complying with ASTM A 36.
  - 1. Reinforce for butt hinges with 1/4" steel plates 10" long welded to aluminum with 6 welds, each 1/2" long.
  - 2. Reinforce for closers with 10-gauge plate, 12-gauge plate for other hardware.
  - 3. Reinforce for all other cutouts and mortises similarly.
- E. Provide positive means to drain to the outside any water entering the system.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap frames to receive nontemplated, mortised, and surface-mounted hardware.
- C. All surfaces that may contact steel, concrete or masonry construction shall be prepared with dissimilar protection materials hereinbefore specified. Aluminum surfaces to remain exposed shall be protected from bituminous paint application.

### 3.3 INSTALLATION

- A. Set frames in locations shown, level, plumb and in line. Seal joints between framing members and mullions. Where moldings are jointed, accurately cut and fit members to result in tightly closed joints.
- B. Do not use exposed fasteners except as approved by Architect.

- C. Internal Drainage: Cut, join and seal members to form positive paths of drainage within the framing in order to prevent any water that may enter the system from leaking through to interior of building.
- D. Frame Anchors: Unless indicated or approved otherwise, space anchors all around opening at not more than 24" o.c. Powder-actuated fasteners will not be allowed.
- E. Glazing Application:
  - 1. Center plane.
  - 2. Outside glazed.
- F. Glazing Beads: Make corners square, butted and tightly fit.
- G. Glazing Seals: Furnish seals to glass installer, ready for installation of glazing.
- H. Apply sealant to both sides of perimeter of frames, using materials and methods specified in Section 079200 - Joint Sealants, including submissions.
- I. Install Material Separation: Provide a coating or material between dissimilar materials as recommended by aluminum door system's manufacturer to protect against corrosion of aluminum materials.
- J. Finish Hardware: Install finish hardware as specified in Section 087100.

### 3.4 ADJUSTING, CLEANING AND PROTECTION

- A. Hardware Adjustment: Adjust and check each operating item, to ensure proper operation and function.
- B. Hardware Lubrication: Lubricate moving parts with lubricant recommended by manufacturer. Use graphite-type lubricant if none other recommended.
- C. Hardware Replacement: Replace units that cannot be adjusted and lubricated to operate freely and smoothly as intended.
- D. Cleaning: Clean aluminum surfaces promptly after installation of frames and doors, exercising care to clean corners and to avoid damage of the protective coating (if any). Remove excess glazing and sealant compounds, dirt and other substances. Final cleaning will be done by General Contractor just prior to time of acceptance.
- E. Touch-Up: Scratches and abrasions shall be touched-up with finish manufacturer's recommended coating, to satisfaction of Architect.
- F. Protection:
  - 1. General Contractor shall provide protective measures and other precautions as required through remainder of construction period, according to recommendations of Installer, to ensure that doors and frames will be without damage or deterioration (other than normal weathering) at time of acceptance.
  - 2. Plastic films applied for protection during shipment shall not be used for protection after installation of aluminum.

END OF SECTION 084113

**SECTION 085113**

**ALUMINUM STOREFRONT WINDOWS**

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. Fixed aluminum storefront windows and borrowed lites.
- 2. Panning trim.

- B. Related Requirements:

- 1. Section 042000 "Unit Masonry" for installing aluminum window frames into masonry walls.
- 2. Section 079200 "Joint Sealants" for perimeter sealing of aluminum windows to exterior walls.
- 3. Section 084113 "Aluminum Framed Entrances" for aluminum doors and frames.
- 4. Section 088000 "Glazing" for glass.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at location as directed by Architect

- 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- 2. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components. Include provisions for anchorage, flashing, sealing perimeters, and protecting finishes.
- 3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
- 4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.

- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
  - 1. Shop drawings must be prepared wholly by the window manufacturer, or a qualified engineering services firm under the direction of the manufacturer.
  - 2. Shop drawings for the window system shall bear the seal and signature of a Structural Engineer licensed in the State of Illinois and contain:
    - a. Anchor locations - If anchors other than thru-jamb type are used, contractor to provide required interior trim as required to conceal fasteners whether shown on the drawings or not.
    - b. Structural integrity.
    - c. Wind loading.
    - d. Structural loading.
    - e. All window installations shall be based on the 2015 IBC.
- C. Samples: For each exposed product and for each finish specified, 2 by 4 inches (50 by 100 mm) in size.
- D. Samples for Initial Selection: For units with factory-applied color finishes.
  - 1. Include similar Samples of hardware and accessories involving color selection.
- E. Samples for Verification: For aluminum windows and components required, showing full range of color variations for finishes, and prepared on Samples of size indicated below:
  - 1. Exposed Finishes: 2 by 4 inches (50 by 100 mm).
  - 2. Exposed Hardware: Full-size units-.
- F. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and Installer.
- B. Product Test Reports: For each type of aluminum window, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For manufacturer's warranties.

## 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports, and calculations.
- B. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project, who has a minimum of 5 years experience in similar window installation projects.

## 1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure to meet performance requirements.
    - b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
    - c. Deterioration of materials and finishes beyond normal weathering.
  - 2. Warranty Period:
    - a. Window Manufacturer: 10 years from date of Substantial Completion.
    - b. Window Installer: 5 years from date of Substantial Completion.
    - c. Aluminum Finish Manufacturer: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Acceptable Manufacturers:
  - 1. Drawings and specifications are based upon Efco Window System as follows or comparable products by Kawneer, Tubelite, Manko or YKK AP or Owner approved equal:
    - a. Fixed: S433, 2" x 4 ½".
- B. Source Limitations: Obtain aluminum windows from single source from single manufacturer.

### 2.2 MATERIALS

- A. All aluminum members, frames, sash bars, glazing beads, muntins and mullions shall be extruded from 6063T alloy of suitable temper and have a minimum tensile strength of 28,000 psi.
  - 1. No main member shall have a wall thickness less than .070"
  - 2. Aluminum glazing beads shall be snap-in type with a minimum wall thickness of .050".
  - 3. Sills/subsills shall have a minimum wall thickness of .090".
- B. Aluminum Glazing Beads: Extruded snap-in type with glazing legs no less than 3/4".
- C. Thermal Barrier: Poured in place polyurethane with max. tensile strength of 4300 psi.
  - 1. Thermally Improved Construction: Fabricate frames, sashes, and muntins with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.

- D. Weatherstripping: Two rows of jacketed foam or neoprene fin gaskets or polypropylene pile installed in dovetailed grooves extruded in sash members and secured to prevent movement, shrinkage or loss. Jacketed type shall conform to AAMA 701.2.
- E. Glazing Seals: As furnished by window manufacturer; color as selected by Architect from manufacturer's standard color options. Any of the following types may be used:
  - 1. Extruded EPDM dry gasket seals with impervious skins.
  - 2. Extruded vinyl dry gasket seals with impervious skins, meeting ASTM D 2287.
  - 3. Extruded neoprene dry gasket seals with impervious skins, meeting ASTM D 2000, type 2BC415 to 3BC415.
  - 4. Extruded silicone dry gasket seals with impervious skins.
  - 5. Expanded neoprene gaskets with impervious skins meeting ASTM C 509, Grade 4.
  - 6. Butyl tape and silicone wet seals as standard to window manufacturer.
- F. Anchors: Aluminum or steel. When anchors are steel they must be primed with shop coat of approved zinc chromate primer and insulated from the aluminum members or must be cadmium or zinc plated to meet ASTM A 165 or A 164 requirements.
- G. Fasteners:
  - 1. Frame Assembly Fasteners: Non-magnetic stainless steel.
  - 2. Miscellaneous Fasteners: Aluminum or non-magnetic stainless steel, with finish color to match frames where exposed to view.
  - 3. Frame Anchor Clip Fasteners: Expansion bolts, toggle bolts or lag screws, as required by building construction material, not less than 1/4" dia., cadmium or zinc plated steel in accordance with ASTM A 164 and A 165.
  - 4. No plastic expansion anchors allowed.
- H. Sills/Subsills:
  - 1. Extruded aluminum sections shall assure that any water entering the glazing channels will be positively weeped to the exterior. Furnish sills with sub-structural components, such as legs and/or blocking, so as to assure complete support of the sill across the window opening.
  - 2. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.
- I. Receptors: Head and Jamb receptors are NOT allowed.
- J. Dissimilar Metal Protection: Alkali resistant bituminous paint conforming to AN-P 31, plastic separators, insulating tapes or manufacturer's standard, subject to Architect's approval.

## 2.3 COMPONENTS

- A. Hardware:
  - 1. All steel components including attachment fasteners to be stainless steel except as otherwise noted.
  - 2. Extruded aluminum components 6063-T5 or T6.
  - 3. Thermo-plastic or thermo-set plastic caps, housings and other components to be injection-molded nylon, extruded PVC or other suitable compound.

B. Sealants:

1. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.

2.4 WINDOW PERFORMANCE REQUIREMENTS

A. Design Wind Loads:

1. The design wind pressure for the project shall be per the IBC 2015 code and should be determined by the Structural Engineer licensed in the State of Illinois obtained by the manufacturer.
2. All structural components, including meeting rails, mullions, anchors and added reinforcing shall be designed accordingly, by a Structural Engineer licensed in the State of Illinois, complying with deflection and stress requirements as listed herein.

B. Air Test: Air infiltration maximum 0.1 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.

C. Water Test: No uncontrolled water leakage at 12.00 psf static pressure differential, with Water application rate of 5 gallons/hr/sq ft when tested in accord with SASTM E331 and ASTM E547.

2.5 GLAZING

A. See Specification Section 088000 "Glazing".

2.6 HARDWARE

A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.

B. Exposed Hardware Color and Finish: Natural Anodized Finish, AA-C22A41, Class 1 (min. 0.7 mils thickness and sealed), natural aluminum color.

C. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners and Anchors: Do not use exposed fasteners or anchors to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
2. Exposed fasteners or anchors shall be covered by trim which matches the finish and colors of the window frame.

2.7 FABRICATION

A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

- B. Weather strip each operable sash to provide weathertight installation.
- C. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.

## 2.8 ALUMINUM FINISHES

- A. Exposed Metal Surfaces: Natural Anodized Finish, AA-C22A41, Class 1 (min. 0.7 mils thickness and sealed), natural aluminum color.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
- E. Glazing Application:
  - 1. Center plane.
  - 2. Outside glazed.



### 3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
  - 1. Keep protective films and coverings in place until final cleaning.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 085113



**DIVISION 08 – OPENINGS**  
**SECTION 087100**  
**FINISH 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. Mechanical door hardware for interior and exterior swinging doors.
- B. Related Requirements:
  - 1. Section 081113 "Hollow Metal Doors and Frames" for new hollow doors set in new hollow metal frames.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. 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: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.

- c. Content: Include the following information:
  - 1) Identification number, location, hand, 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) Fastenings and other pertinent information.
  - 5) Explanation of abbreviations, symbols, and codes contained in schedule.
  - 6) Mounting locations for door hardware.
  - 7) List of related door devices specified in other Sections for each door and frame.
- 2. Keying: All cylinders to be Sargent LA keyway. 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. Coordinate all keying with the Owner.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Special warranty specified in this Section.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
  - 1. Warehousing Facilities: In Project's vicinity.
  - 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- B. Source Limitations: Obtain each type of door hardware from a single manufacturer.
- C. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- D. Accessibility Requirements: Comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design and ICC A117.1.
  - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
  - 2. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
  - 3. Closers: Adjust door and gate closer sweep periods so that, from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

## 1.6 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.

## 1.7 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 security consultant.
- C. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail 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: Two years from date of Substantial Completion, unless otherwise indicated.
    - a. Exit Devices: 3 years from date of Substantial Completion.
    - b. Manual Closers: 10 years from date of Substantial Completion.
    - c. Bored Locksets: 3 years from date of Substantial Completion.
    - d. Hinges: Life of Building from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section as follows:
  - 1. Continuous Hinges: Roton, No substitutions.
  - 2. Locks: Sargent, No substitutions.
  - 3. Closers: Norton, No substitutions.
  - 4. All Other Hardware: As specified or Owner approved equal.

### 2.2 FABRICATION

- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except 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 and wood doors.
  - 3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

### 2.3 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. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

### 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. Standard Steel Doors and Frames: ANSI/SDI A250.8.
- 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. 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 type quantities indicated in door hardware schedule.
- D. Thresholds: Set threshold in full bed of sealant.
- E. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- F. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- G. Closers: Sex-bolt all closers on wood doors.

### 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. 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.

### 3.6 DOOR HARDWARE SCHEDULE

#### **Hardware Group No. 1**

Door(s) G29

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	780-112HD	628	ROT
1	EA	ELECTRIC STRIKE	9400 12VDC	630	HES
1	EA	PANIC HARDWARE	LD8810 X 862 (OFFSET PULL TRIM)	626	SAR
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	7500 EDA X PA MOUNTING PLATE X BLADE STOP SPACER AS REQ'D	689	NOR
1	EA	DOOR SWEEP	315CN	A	PEM
1	EA	THRESHOLD	2009APK	A	PEM

**\*\*INGRESS BY THE CARD READER (BY OTHERS) OR AIPHONE SYSTEM (BY OTHERS).**

**\*\*WEATHER SEALS BY ALUMINUM DOOR MANUFACTURER.**



**Hardware Group No. 2**

Door(s) G28

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	780-112HD	628	ROT
1	EA	ELECTRIC STRIKE	9400 12VDC	630	HES
1	EA	PANIC HARDWARE	LD8810 X 862 (OFFSET PULL TRIM)	626	SAR
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	7500 EDA X PA MOUNTING PLATE X BLADE STOP SPACER AS REQ'D	689	NOR

**\*\*INGRESS BY THE CARD READER (BY OTHERS) OR AIPHONE SYSTEM (BY OTHERS).****Hardware Group No. 3**

Door(s) G27

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	780-112HD	628	ROT
1	EA	ELECTRIC STRIKE	1500 12VDC	630	HES
1	EA	INSTITUTIONAL LEVERSET	10G17 X LL	626	SAR
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	7500 EDA	689	NOR

**\*\*INGRESS BY THE CARD READER (BY OTHERS), AIPHONE SYSTEM (BY OTHERS) OR KEY OVERRIDE.**

END OF SECTION 087100



**SECTION 088000**  
**GLAZING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
  - 1. Glazing of exterior aluminum storefront windows, entrance framing and doors.
- B. Related Requirements:
  - 1. Section 084113 "Aluminum Framed Entrances" for glazing of new aluminum entrances.
  - 2. Section 085113 "Aluminum Storefront Windows" for glazing of new aluminum windows.

1.3 QUALITY ASSURANCE

- A. Comply with all pertinent codes and regulations, including the Consumer Product Safety Commission Safety Standard for Architectural Glazing Materials (16 CFR 1201) and the State of Illinois Safety Glazing Materials Act.
- B. Comply with all pertinent recommendations in the Glazing Manual of the Flat Glass Marketing Association.
- C. All glass shall bear glass manufacturer's label stating variety and grade.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturers' product data describing each type of glass and glazing item specified herein.
- B. Samples: Submit for Architect's review 2 samples, 6" square, of each type of glass required.
- C. Manufacturer's Instructions: Submit glazing gasket manufacturer's recommendations for each installation situation.

1.5 WARRANTIES

- A. Installer shall guarantee installed work to be waterproof for a period of 5 years.

- B. Insulating glass units shall be warranted for 10 years against failure, including interpane dusting or misting and internal dew point rising above -50°F. Warranty shall provide for replacement of glass and glazing, including labor.

#### 1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver glazing materials to job site in sealed containers with manufacturer's original labels attached to each piece of glass. Provide UL labels for fire rated glass. Provide cushions at edges to prevent impact damage.
- B. Store glass on edge, under cover and protect from staining.
- C. Avoid deformation of units. Protect faces from scratches and abrasion.

### PART 2 - PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURER

- A. Insulating-Glass Units: ASTM E 2190, certified through IGCC as complying with requirements of IGCC. PPG is the basis-of design manufacturer or Owner approved equal products of Guardian and Pilkington during the bidding phase. Glass types shall be as follows:
  - 1. GL 1: PPG 1" Insulated Solarban R100-Laminated:
    - a. 1/4" tempered on clear neutral reflective Low-E #2 surface.
    - b. 1/2" airspace with argon.
    - c. 1/8" clear annealed.
    - d. .030 PVB Interlayer
    - e. 1/4" clear laminated tempered.
  - 2. GL 2: 1/4" Clear Laminated Tempered Glass.
  - 3. GL 3: 1/4" Clear 20 min. Fire Rated Glass.
  - 4. GL 4: PPG 1" Insulated Solarban R100-Tempered:
    - a. 1/4" tempered on clear neutral reflective Low-E #2 surface.
    - b. 1/2" airspace with argon.
    - c. 1/4" clear laminated tempered.

#### 2.2 Glazing Materials:

- A. Approved Manufacturers: Use products of the following:
  - 1. Tremco Manufacturing Co.
  - 2. G.E.
  - 3. Dap, Inc.
  - 4. Pecora Corp.
  - 5. Protective Treatments, Inc. (PTI).
  - 6. Vetrotech (Saint-Gobain).

- B. Setting Blocks: Neoprene, 70-90 durometer hardness, having proven compatibility with sealants used, width of rabbet less 1/16" by lengths sufficient for weight of glass supported.
- C. Spacers: Neoprene, 40-50 durometer hardness, having proven compatibility with sealants used.
- D. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with sealants used, flexible and resilient, with 5-10 psi compression strength for 25% deflection.
- E. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings that are not firmly bonded to the substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used. Verify that weep holes are free of obstructions.
- B. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.
- C. Cut glass with smooth straight edges to full sizes required by openings. Do not attempt to cut, seam, nip or abrade glass that is tempered, heat strengthened, or coated.

#### 3.3 INSTALLATION

- A. Glass:
  - 1. Set glass on setting blocks at quarter points, and fix without springing or inducing bowing. Install with proper bite and clearances all around.
  - 2. Glass having waviness shall be set with waves placed horizontally unless Architect directs otherwise. Lites viewed in series or as a group shall have uniform draw, bow and similar characteristics.
  - 3. Tempered glass having tong marks shall be installed so that tong marks are within rabbets at top of opening.

### 3.4 CLEANING

- A. All glass shall be left whole, free from checks or other defects, and cleanly washed inside and out and the building left ready for occupancy when directed by the Architect.
- B. Any defective glass that may appear after cleaning shall be removed and replaced with perfect glass.

END OF SECTION 088000

**DIVISION 09 – FINISHES**  
**SECTION 092900**  
**GYPSUM BOARD SYSTEM**

**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. Provide and install gypsum board partition on metal studs with batt insulation.
  - 2. Provide gypsum board soffits and ceilings.
- B. Related Requirements: Section includes surface preparation and the application of paint systems
  - 1. Section 072100 "Building" for insulation designated for this section.
  - 2. Section 099113 "Painting" for finish painting of gypsum board surfaces.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.

**1.4 DELIVERY, STORAGE AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

**1.5 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or blotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

### 2.1 FRAMING MATERIALS

- A. Metal Studs: Zinc coated steel channel studs, 20-gauge, 3-5/8" size except as required otherwise, conforming to ANSI/ASTM C 645 or GA 201 or GA 216.
- B. Runner Tracks:
  - 1. 20-gauge metal, matching stud width. Use tracks with minimum 1-1/4" leg when indicated or directed.
  - 2. Deflection Track: Provide for deck deflection by using "VertiTrack" manufactured by The Steel Network, Inc., tel: 888-474-4876 or approved equal, complete with manufacturer's patented fasteners having step bushings sized to the gauge of the studs.
- C. Reinforcing Strips: Electro-galvanized 20-gauge sheet steel meeting ASTM A 525, 8" wide.
- D. Angle Connectors: Galvanized 20-gauge sheet steel meeting ASTM A 525, formed into angle with 1-1/2" legs.

### 2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### 2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Board,: ASTM C 1396/C 1396M, Fire rated, tapered edge, conforming to ANSI/ASTM C 36 & C 1396, 5/8" thick:
  - 1. "Tough Rock Fireguard X Abuse Resistant Gypsum Board" by Georgia Pacific.
  - 2. "Gold Bond Hi-Abuse XP Gypsum Board" by National Gypsum Company.
  - 3. "Fiberock Abuse Resistant Interior Panels" by USG.
  - 4. Or approved equal

### 2.4 FINISH MATERIALS

- A. Edge and Corner Reinforcement: Manufacturer's standard trim beads made of hot-dip galvanized steel with either knurled and perforated or expanded flanges, and beaded for concealment of flanges in joint compound. Vinyl trim NOT allowed.
  - 1. Corner Beads: Paper-faced heavy gauge metal or plastic with extra wide flanges, equal to USG "B1XW EL" or No-Coat "Ultracorner".
  - 2. Edge Beads: Paper-faced heavy gauge metal or plastic "L" type with extra wide flanges, equal to USG "B4 (1")" or No-Coat "L Trim.
  - 3. Control Joint Beads: Flexible expansion channel, such as USG #093 or Gold Bond ".093 Zinc Control Joint."

### 2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.



- B. Reinforcing Tape: Perforated joint reinforcing tape, paper or fiberglass, asbestos free.
- C. Joint Compound: Ready mixed all-purpose drywall joint compound, type and mix as required for conditions of humidity and temperature. Use topping type compound for finishing coats.

## 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Fasteners: Screws meeting ASTM C 954 and the following:
  - 1. For direct attachment to masonry: Tapcon Screws or Perma-Grip Nails as recommended by Gypsum Board mfg.
  - 2. For metal to metal framing: 1/2" long, Type S, shallow pan-head screws.
  - 3. For gypsum board: 1-1/4" Type S bugle-head screws.
  - 4. For moving (deflection) joints: "VertiClip Step Bushing Fasteners" sized to match gauge of studs.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 FRAMING INSTALLATION

- A. Partitions:
  - 1. Base Tracks: Install continuous tracks, straight and true, accurately aligned to the layout at base and at tops of studs. Set floor tracks in a continuous bead of acoustical sealant. Secure tracks at each end and a maximum of 24" o.c. in between. Use powder actuated pin anchors for anchoring to concrete.
  - 2. Studs: Set studs plumb, not more than 16" o.c. and not more than 2" from abutting walls. In each line of studs, face flanges all in the same direction.
  - 3. Partition Heights: All studs shall extend to heights as noted on Drawings.
  - 4. Stud Securement: Studs shall engage both floor and top runners. Secure studs to tracks with 2 screws at top and 2 screws at bottom, one each at both inside and outside flanges.
  - 5. Top Track: Provide multiple runner track installation, at top of wall to accommodate deck deflection.
  - 6. Stud Flanges: Do not cut to accommodate pipes, conduit, etc. without Architect's specific approval for each case.

- B. Control Joints:
1. Placement: As indicated, consistent with lines of building spaces. Provide additional control joints in locations approved by General Contractor so that no expanse of wall exceeds 30 feet.
  2. Framing: Frame each control joint in walls with 2 nearly abutting studs set back to back. Seal each side of space between studs with bead of sealant.
  3. Control joints shall be installed both sides of door frames up to top of wall.

### 3.3 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- D. Form control and expansion joints with space between edges of adjoining gypsum panels.
- E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  2. Fit gypsum panels around ducts, pipes, and conduits.
  3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch wide joints to install sealant.
- F. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

### 3.4 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
1. Type X: Vertical surfaces unless otherwise indicated.
- B. Single-Layer Application:
1. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
  2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

### 3.5 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install cornerbeads at outside corners.

### 3.6 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  - 1. Level 1: At panel surfaces that will not be visible.
  - 2. Level 4: At panel surfaces that will be covered by finish painting.

### 3.7 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900



**DIVISION 09 – FINISHES**  
**SECTION 095123**  
**ACOUSTICAL CEILINGS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Acoustical tiles for ceilings.
  - 2. Acoustical ceiling suspension systems.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product, submit product data from manufacturer's brochures describing each of the products to be used.
- B. Samples:
  - 1. Submit samples of acoustical materials and suspension system members for review before ordering any materials.
  - 2. For each exposed product and for each color and texture specified, 6-inches- in size.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
  - 1. Acoustical Tile: Set of full-size Samples of each type, color, pattern, and texture.
  - 2. Exposed Moldings and Trim: Set of 6-inch long Samples of each type and color.

**1.4 MAINTENANCE MATERIAL SUBMITTALS**

- A. Maintenance Stock: Furnish not less than 1 unopened bundle of each type of acoustical ceiling units for future maintenance. Distribute quantities in approximate proportion to the different types of units installed. Deliver to location on site designated by Owner.

**1.5 QUALITY ASSURANCE**

- A. Qualifications of Installers: Use only personnel who are thoroughly trained and experienced in the erection of the selected systems.
- B. Installation Standards: Comply with recommendations of the current CISCA "Ceiling Systems Handbook" except as specified otherwise hereinafter, and maintain a copy of the handbook at the site for Architect's inspection while work of this Section is being accomplished.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

## 1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

## 1.8 WARRANTIES

- A. Ceiling Panels: Where so specified herein below, products shall be warranted to be free from defects in materials and workmanship for a period of 10 years from date of purchase when subjected to the conditions of temperature and humidity specified.

# PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
  - 2. Smoke-Developed Index: 450 or less.

## 2.2 ACOUSTICAL TILES, GENERAL

- A. Source Limitations:
  - 1. Acoustical Ceiling Tile: Obtain each type from single source from single manufacturer.
  - 2. Suspension System: Obtain each type from single source from single manufacturer.
- B. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.
  - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.
- C. Acoustical Tile Colors and Patterns: Match appearance characteristics indicated for each product type.

## 2.3 ACOUSTICAL TILES

### A. Acoustical Ceiling Panels Types:

1. Type ACT-1: Angled tegular, fissured 24" x 24" x 3/4", lay-in panels; Accepted Products, Armstrong #584BN or approved equal.

## 2.4 METAL SUSPENSION SYSTEMS

### A. Exposed Grid Ceiling Suspension Systems: Rigid metal, complying with ASTM C 635, intermediate duty system, consisting of interlocking cross tees and main tee runners (not less than .020" thick) made from cold rolled, zinc-bonded or electro-galvanized steel and creating flush joints at intersections.

1. Components shall support items penetrating the ceilings, including light fixtures and HVAC outlets/inlets.
2. Tee sections shall be double web type with a 1" exposed flange cap finished in baked white enamel.
3. Hold-Down Clips (for use where specified): Manufacturer's standard electro-galvanized steel hold-down clips.
4. Use USG "Donn DX" suspension systems for 24" x 24" grids or approved equal.

### B. Wall Molding: Angle type, hemmed metal molding with finish to match grid system.

### C. Hanger Wire: Pre-stretched, galvanized, soft-annealed mild steel wire conforming to ASTM A 641, 12-gauge.

### D. Carrying Channels (for bridging between structural members overhead): Hot or cold rolled steel 1-1/2" channels painted with black asphaltic rust inhibitive paint and weighing not less than 475 lbs. per 1000 lineal feet.

### E. Tie Wire for Attachment of Channels to Structure: Galvanized steel wire conforming to ASTM A 641, 16-gauge.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

#### A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

#### B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.

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

### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders, and comply with layout shown on reflected ceiling plans.

### 3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

- A. General: Install acoustical panel ceilings to comply with ASTM C 636, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  - 3. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 4. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  - 5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  - 6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  - 7. Do not attach hangers to steel deck tabs.
  - 8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  - 9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
  - 10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical tiles.
  - 1. Do not use exposed fasteners, including pop rivets, on moldings and trim.



- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material.
  - 1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
  - 2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tile and moldings, spaced 12 inches o.c.

#### 3.4 CLEANING

- A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095123



**SECTION 096813**  
**CARPET TILE**

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 modular carpet tile.
  - 1. Preparation of concrete floors to receive new carpeting and wall surface to receive new rubber base to include:
    - a. Moisture testing of concrete floors.
    - b. Documentation of tests.
  - 2. Moisture Mitigation.
  - 3. Skim coat all areas to receive new flooring
  - 4. Carpet tile
  - 5. Rubber base, Transition strips, and other accessories.

1.3 QUALITY ASSURANCE

- A. Installer's Qualifications: Carpet Installation Company: Shall be certified by carpet manufacturer and shall have at least 5 years' satisfactory experience in the installation of carpets of the types specified. Only qualified and experienced carpet mechanics working under proper supervision shall be employed on the project.
- B. Flammability Test Requirements: Provide only materials, including adhesives, which will produce an installation having a Critical Radiant Flux of not less than 0.45 watts per square centimeter when tested by the Flooring Radiant Panel Test.
- C. Adhesive Test Requirements: The suitability of the adhesive will require testing as further specified herein after under EXAMINATION.

1.4 SUBMITTALS

- A. Certifications:
  - 1. Manufacturer shall submit certification that materials manufactured are in accordance with materials herein specified. Include certified laboratory test report for flammability requirements.
  - 2. Manufacturer shall submit certification that Installer is a factory approved installer.

- B. Samples: Submit samples of carpets. Label samples, stating color or shade, location in which they are to be used and manufacturer's name. Carpet samples shall be at least one tile per pattern.
- C. Maintenance Supply: Provide 5% maintenance stock of each type of carpet used. Package unused carpet tiles in boxes suitable for preservation of carpet in long term storage. Deliver packaged tiles to location in building designated by Owner
- D. Maintenance Manuals: Obtain from manufacturer and submit for Owner's use, 3 copies of manufacturer's complete maintenance recommendations for carpet(s) installed.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and installation of carpeting shall be coordinated with completion schedule for the various areas.
- B. Carpet shall be stored away from construction activities and shall be protected against moisture, dust and vermin.
- C. Installation shall not begin in any area until painting and ceiling work for that area have been completed.

#### 1.6 GUARANTEES

- A. Guarantees shall start at an adjusted date if carpet is installed after the date of Substantial Completion.
- B. Provide a 2 year installation warranty in addition to other warranties standard to the manufacturer for the carpets selected.

### PART 2 - PRODUCTS

#### 2.1 CARPET TILE

##### A. CPT -1 Walkoff Carpet:

Acceptable Manufacturer and Product: Shaw Contract

- 1. Style: Entrée Tile – Modular Tile 24" x 24"
- 2. Colletion: Steppin' Out
- 3. Color: Charcoal 31569
- 4. Installation Method: Ashlar, stripe pattern of CPT-1 shall run from left to right as you enter the building.

##### CPT-2

Acceptable Manufacturer and Product: Tarkett/Tandus Centiva

- 5. Style: Aftermath II 03026– Modular 24" x 24"
- 6. Color: Fireworks 23514

Installation Method: Match existing placement/direction of same carpet in adjacent areas.

## 2.2 ACCESSORIES

### A. Carpet:

1. All seam tape, edge sealers and other accessories shall be as recommended by the carpet manufacturer.
2. Adhesives: Use Manufacturers recommended adhesive. Water based, strippable, waterproof type, compatible with substrate and carpeting materials, as recommended by carpet manufacturer.

### B. Acceptable Wall Base Products & Manufacturers: Rubber material complying with ASTM F 1861, Type TS, 6" high. 4" at casework only. Use 946 Contact adhesive. 1/8" .080" thick, Style B coved profile, furnished in rolls.

1. Acceptable Manufacturer: Tarkett.
2. Color: 32 Pebble
3. Refer to drawings for locations.

### C. Edge Transitions at all flooring types: Tarkett Slimline products, Color 32 Pebble. Include manufacturers recommended transition strip adhesives and accessories. Type of Slimline transition, such as SLT-XX-C or SLT-XX-A will be based on best solution for each transition on site.

### D. Follow all manufacturers product data sheets and installation methods for carpet, rubber base, transitions, and accessories.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that building air temperature and relative humidity are within manufacturers' recommended limits and that concrete floor temperatures are within 20°F of surrounding air temperatures.
- B. Provide required floor Moisture Vapor Emission Rate (MVER) testing, pH testing and Relative Humidity testing prior to flooring installations. MVER Testing (ASTM F-1869-10), RH Testing (ASTM F-2170 -10), pH Testing (ASTM F-710-10). A minimum of one test per 1,000 square feet of flooring space is required. Check manufacturer's full requirements and warranties prior to installation. Cost for testing is paid for by the flooring contractor.
  1. Moisture meter readings and plastic mat test results will not be accepted as conclusive.
    - a. Perform tests in areas where drying is most restricted but not closer than 5ft to a perimeter.

- b. Report adverse conditions including documentation of test results to the general contractor in writing.
- C. Submit Moisture readings to the Architect for review with owner. If readings are higher than manufacturers recommended limits, moisture mitigation is required, a change order will be processed to cover the cost of the mitigation. The change order will be based on the unit price cost for the Bone Dry System as listed on the Bid Form.
- D. At areas requiring Moisture Mitigation, provide the following:

Bone Dry Pro. [www.bonedryproducts.com](http://www.bonedryproducts.com) Contact: James Gourley (262) 694- 9748 ext 803 [james@bonedryproducts.com](mailto:james@bonedryproducts.com)

- 1. Provide all physical materials for complete Bone Dry Pro Penetrating Sealer system. Follow manufacturer's complete specification sections and product data sheets. Follow manufacturers full recommended preparation and installation methods. Provide documentation of any type of adhesive solvent/chemicals used, to determine manufacturers recommended prep methods.
    - a. Clean floor of all foreign substances – drywall, paint, dust, debris.
    - b. Etch-A-Crete. Scarify/Etch concrete.
    - c. Fully protect all adjacent surfaces. Flooring contractor responsible to remove product from of any adjacent surfaces.
    - d. Clean with auto scrubber.
    - d. Apply Bone Dry.
    - e. Wait 24 hours, prior to flooring installation.
  - 2. For Moisture Mitigation of existing concrete slabs apply 1/8" skim coat or leveler with appropriate Schonox or Ardex Portland based cement compound prior to Bone Dry Pro Penetrating Sealer.
  - 3. Register project with Bone Dry Manufacturer. Provide Manufacturers certificate of 20 year warrantee.
  - 4. Provide written documentation from Bone Dry that their system is approved for moisture mitigation with each flooring type and the adhesive used.
- E. Start of flooring and base preparation and installation will indicate acceptance of the suitability of subfloor and wall conditions and acceptance of full responsibility for completed work. Remove and replace at no charge to Owner all work under this Section which may require removal in order to correct defects caused by insufficient examination and preparation of the substrates.

### 3.2 PREPARATION

- A. Should excessive alkalinity be discovered, treat the affected areas with a water solution containing 10% muriatic or acetic acid and allow solution to dry.
- B. Skim coat ALL areas to receive new flooring using Schonox SL Patch Portland Cement Based compound, at 1/8", or a Schonox Leveler, or equal following manufactures recommended installation, product data sheets, and specifications.

- C. Fill saw cut joints, construction joints, expansion joints, cracks and depressions with flexible vinyl filler or portland cement product as required to prevent show-through.
- D. Clean and prepare to a satisfactory condition all surfaces scheduled to receive carpeting.
- E. Check the match of carpet tiles to ensure that there is no visible variation between dye lot runs.

### 3.3 INSTALLATION

#### A. Carpet Tiles:

1. Glue vinyl backed carpet tile directly to floor. Use manufacturer's recommended application pattern for adhesive and cover floor evenly with adhesive.
2. Follow manufacturer's recommended installation for fillers.
3. Install transition strip at all exposed edges of carpet and where carpet abuts any other floor material, except at ceramic tile, in which case, the edging will be provided with the tile. Edging shall be one continuous piece at doors and wherever standard lengths permit. Securely fasten edging to floors.
  - a. When carpet ends at doorway and door swings over carpet, place carpet under door (but not beyond door) and finish carpet with nose of edge strip aligned with the edge of the stop on the door frame.
  - b. When carpet ends at doorway and door swings away from carpet, place carpet up to face of door and finish carpet with edge strip having its nose aligned with the edge of the stop on the door frame.

#### B. Rubber Base

1. Comply with manufacturers written instructions for installation.
2. Apply rubber base to walls and casework, in rooms where base is required.
3. Install rubber base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
4. Tightly adhere rubber base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
5. Do not stretch rubber base during installation.
6. On masonry surfaces or other similar irregular substrates, fill voids along top edge of rubber base with manufacturers recommended adhesive filler material. Install performed corners before installing straight pieces.

### 3.4 ADJUSTMENTS

- A. Tiles that have not "seated" in level plane with surrounding tile shall be removed and cleaned and re-set with new adhesive.
  1. Misaligned joints in base shall be reset or replaced with new, properly fitting pieces as required.
  2. Any resilient base or transition strip that shrinks on the wall or between two flooring types within 1 year of installation shall be replaced at no charge to the Owner.
- B. Tile showing broken corners or fracture lines entirely across their surfaces, or flawed unparallel linear patterns on surface shall be removed, removed and new tile of same

color, etc., substituted. Repair tile showing minor breaks and fractures or inconsistencies on vinyl backing.

### 3.5 PROTECTION

- A. No furniture or other heavy objects shall be placed on carpet until the adhesive has cured.
- B. Protect carpet after installation against stains and accumulations of dust and debris.

### 3.6 CLEANING AND PROTECTION

- A. The completed installation shall be free of scraps, carpet ripples and puckers. Clean up all dirt and debris. Clean all spots with proper remover. Remove loose threads; reweave any ravel at seams or edges.
- B. Damage: Repair any damage to existing paintwork, millwork, walls, doors, floors, etc., caused by carpet installation.
- C. Upon completion of the installation remove all waste, excess materials, protective coverings, tools and equipment.
- D. Carefully and thoroughly vacuum clean all new installed carpet to Owner's satisfaction. Do not begin vacuuming until perimeter resilient base has cured at least 10 days. When schedules allow, do not begin vacuuming until 14 days after installation of resilient base.

END OF SECTION 096813



## DIVISION 09– PAINT

**SECTION 099123**  
**INTERIOR PAINTING**

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, as provided by the Owner, apply to this Section.

## 1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on interior substrates:
  - 1. Concrete masonry units (CMU).
  - 2. Glazed CMU / structural glazed wall and base.
  - 3. Steel and Metal substrates.
  - 4. Gypsum board.
- B. See paint plans for each school for selected paint colors and locations.
- C. For any item solely identified in the bid documents as “Basis of Design”, “Owner Approved Equal” products may be considered.

## 1.3 DEFINITIONS

- A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523, a matte flat finish.
- B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, a high-side sheen flat, velvet-like finish.
- C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, an eggshell finish.
- D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523, a satin-like finish.
- E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523, a semi-gloss finish.
- F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523, a gloss finish.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
  - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
  - 2. Step coats on Samples to show each coat required for system.
  - 3. Label each coat of each Sample.
  - 4. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
  - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
  - 2. VOC content.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used. Use same designations indicated on drawings / schedules.

#### 1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: For each facility where work is performed, Provide 1 gal. (3.8 L) of each coating type in each color applied.

#### 1.7 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Owner will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
    - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
    - b. Other Items: Architect will designate items or areas required.
  - 2. Final approval of color selections will be based on mockups.

- a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion and accepted by Owner.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer's label with the following information:
  1. Product name and type (description).
  2. Batch date.
  3. Color number.
  4. VOC content.
  5. Environmental handling requirements.
  6. Surface preparation requirements.
  7. Application instructions.
- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
  1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage and work areas daily.

#### 1.9 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Lead Paint: It is not expected that lead paint will be encountered in the Work.
  1. If suspected lead paint is encountered, do not disturb; immediately notify Owner.
- D. Lead Paint: Lead paint **may be** present in buildings and structures to be painted. A report on the presence of lead paint is on file for review and use. Examine report to become aware of locations where lead paint is present.

1. Do not disturb lead paint or items suspected of containing hazardous materials except under procedures specified.
2. Where applicable, perform preparation for painting of substrates known to include lead paint in accordance with EPA Renovation, Repair and Painting Rule and additional requirements of authorities having jurisdiction.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Sherwin-Williams Company. Subject to compliance with requirements, provide products indicated in construction documents or Owner-approved equal from one of the following:
  1. Sherwin-Williams Company.
  2. Benjamin Moore & Co.
  3. Glidden Professional, Division of PPG Architectural Finishes, Inc.
  4. PPG Architectural Finishes, Inc.
  5. Pratt & Lambert.
- B. Source Limitations: Obtain paint materials from single source from single listed manufacturer.
  1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

### 2.2 PAINT, GENERAL

- A. Material Compatibility:
  1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. VOC Content: Comply with current State of Illinois Regulations regarding VOC (Volatile Organic Compounds).
- C. Colors: Match Owner's final approved samples as indicated in construction documents.

### 2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
  1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  2. Testing agency will perform tests for compliance with product requirements.

3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible. Contractor responsible for substrate damage identified, resulting from removal of rejected materials based on compliance testing.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.
  1. Applicator to report, in writing, conditions that may affect application, appearance, or performance of paint.
- B. Substrate Conditions:
  1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
    - a. Masonry (Clay and CMU): 12 percent.
    - b. Wood: 15 percent.
    - c. Gypsum Board: 12 percent.
    - d. Plaster: 12 percent.
  2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
  3. Plaster Substrates: Verify that plaster is fully cured.
  4. Existing finished surfaces: Verify existing finish is adequate or made ready to receive new finish.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Patch and prepare surfaces to create like-new finish conditions.
- B. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

- C. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- D. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, tape and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- E. Concrete Masonry Units (CMU): Clean all CMU with Simple Green or "Owner-approved equal" product.
- F. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- G. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- H. Structural Glazed Tile, Glazed CMU:
  - 1. The vitreous substrate must be structurally sound. Clean greasy, oily surfaces with hot soapy solution like Spic & Span. Followed by xylene solvent wipe.
  - 2. Lightly sand all surfaces paying particular attention to grout joints. Vacuum dust.
- I. Steel and Metal Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
  - 1. SSPC-SP 2, "Hand Tool Cleaning."
  - 2. SSPC-SP 3, "Power Tool Cleaning."
  - 3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
  - 4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
- J. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

### 3.3 APPLICATION

- A. Apply one coat of primer and two coats of finish paint.
- B. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
  - 1. Use applicators and techniques suited for paint and substrate indicated.

2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces. All operable parts must be in full operable condition when painting is complete and dry.
  4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- C. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- D. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- E. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

### 3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
  2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### 3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project Site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

### 3.6 INTERIOR PAINTING SCHEDULE

- A. CMU Substrates:

1. Water-Based Light Industrial Coating System:
  - a. Block filler: Latex, interior/exterior: S-W PrepRite Block Filler, B25W25, at 100 to 200 sq. ft. per gal (2.4 to 4.9 sq. m per l). (Use if unpainted CMU.)
  - b. Primer: S-W Protective & Marine Coatings, DTM Acrylic Coating (not required above 6'-0" above finished floor).  
Topcoat: 2 coats Light industrial coating, interior, water based, eggshell: S-W Pro Industrial Pre-Catalyzed Water-based Epoxy, K45-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat.
- B. Glazed CMU – structural glazed walls and base:
  1. Two Step System:
    - a. Step One: 1 coat Primer / Tack Coat SW 5531.
    - b. Step Two: 2 coats - Pro Industrial Waterbased Catalyzed Epoxy B73 Series, Eg-Shel.
- C. Steel and Metal Substrates - Aluminum, Steel, Hollow Metal Frames and Doors, Interior and Exterior Lintels, Vault frame and door:
  1. Latex System:
    - a. Prime Coat: Primer, rust-inhibitive, water-based alkyd: S-W Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series, at 5.0 to 10 mils wet, 2.0 to 4.0 mils dry. (Use if unpainted metal substrate.)
    - b. Intermediate Coat: Water-based acrylic, interior, matching topcoat.
    - c. Topcoat: Water-based acrylic, semi-gloss: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series, at 2.5 to 4.0 mils dry, per coat.
    - d. Topcoat: Water-based acrylic, semi-gloss: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series, at 2.5 to 4.0 mils dry, per coat.
- D. Gypsum Board:
  1. Water-Based Light Industrial Coating System:
    - a. Primer: Protective & Marine Coatings, DTM Acrylic Coating
    - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
    - c. Topcoat: Light industrial coating, interior, water based, eggshell: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat.

END OF SECTION 099123



**SECTION 101400**  
**INTERIOR & EXTERIOR SIGNAGE**

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. Furnishing and installation of exterior wall signage.
- 2. Furnishing and installation of interior signage at front desk.

- B. Related Requirements:

- 1. Section 074213 "Formed Metal Wall Panels" for exterior wall substrate.
- 2. Section 062000 "Carpentry Work" as reference for front desk lettering.

1.3 QUALITY ASSURANCE

- A. Refer to drawings for layout and signage types to be provided.
- B. Sign Maker shall not proceed with fabrication without Owner's written approval of texts.
- C. Installation of signs shall be only by highly experienced and accomplished craftsmen.
- D. Submit 2 actual sign samples for Architect's review and approval.

1.4 ACTION SUBMITTALS

- A. Make submittals under provisions of Section 013300 – Submittal Procedures.
- B. Submit 2 copies of manufacturer's specifications and installation instructions for each type of identifying device required.
- C. Submit 3 samples of each color and finish of exposed materials and accessories required for identifying devices.
- D. Submit Shop Drawings for fabrication and erection of identifying devices. Include plans, elevations, and large-scale details of sign wording and lettering layout for review and approval. Show anchorages and accessory items.

## PART 2 - PRODUCTS

### 2.1 MATERIALS AND MANUFACTURERS

#### A. Exterior Cast Aluminum Signage:

1. Approved Manufacturers:
  - a. Best Sign Systems.
  - b. Gemini.
  - c. Scott.
2. Type: Flat metal direct wall mounted (no stand-offs), cast Aluminum with flat face. Color: Black to match existing or as determined (selected) by Architect. Provide physical finish samples.
3. Font: To match existing, or as determined (selected) by Architect.
4. Sizes: 10" high x 1" depth.
5. Location: Placement on site (direct wall mount) shall be approved by Architect prior to installation.
6. See drawings for further details.

#### B. Exterior Door Identification Signage (below cast letters). Provide & Install. See drawings for further details, contractor shall match existing, Smart Signs Inc. or equal.

#### C. Inserts and Anchorages:

1. Furnish inserts and anchoring devices that must be built into masonry for the installation of signage.
2. Use concealed fasteners and anchors unless indicated to be exposed.
3. furnish nonferrous-metal or stainless-steel devices.

#### C. Interior letters at front desk. See casework drawings.

1. Approved Manufacturers:
  - a. Best Sign Systems.
  - b. Gemini.
  - c. Scott.
2. Type: Flat Cast Aluminum Letters
3. Finish: Brushed aluminum
4. Font: Helvetica bold or as determined by architect.
5. Size: 4" Height 3/4" depth.
6. Install on laminate in recess on front desk, with template using standard letter mounting materials for direct mount.
7. Provide sample letter and layout drawing for review in shop drawings.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Installer must examine the substrates and conditions under which the identifying devices are to be installed and notify the Architect in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
  - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
  - 2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
  - 3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint

B. Mounting Methods.

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
  - a. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101400

**SECTION 312000**  
**EARTH MOVING**

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 earth moving work consisting of:
  - 1. Excavation for footings and foundations.
  - 2. Rough grading for new concrete slabs-on-grade and stoops on grade.
  - 3. Removal of unsatisfactory material below rough grade and subgrade levels as required.
  - 4. Provision of granular materials from offsite for structural fill as required.
  - 5. Classifying and stockpiling usable excavated material, on site, for re-use.
  - 6. Preparation of subgrades to receive fills.
  - 7. Filling, backfilling and compaction of fills.
  - 8. Finish grading of disturbed site areas.
  - 9. Removal of excess excavated materials.
- B. Related Requirements:
  - 1. Section 033000 "Cast-In-Place Concrete" for cast-in-place concrete work.

1.3 COORDINATION

- A. Coordinate earth moving work for building with civil earthwork.

1.4 SUBMITTALS

- A. Process all submittals per requirements in Section 013300 – Submittal Procedures.
- B. Submit to the Soil Testing Service 50 pound representative samples of each proposed fill material at least 2 days prior to the start of any filling operation.
- C. The Soil Testing Service shall submit 2 copies of all test reports to Owner's Representative.

## 1.5 QUALITY ASSURANCE

### A. Soil Testing and Inspection Service:

1. The Owner shall engage the services of a soils testing service, to test in-place foundation soils and other soil materials proposed for use in the Work.
2. Costs for the first testing of an area shall be paid for by the Owner. All testing required for checking and correcting faulty work or work to be re-done shall be paid for by the Contractor at his own expense.
3. Services shall include:
  - a. Observation of proofrolling.
  - b. Sieve analysis of material to be used for compacted fill beneath footings and for fill beneath concrete slabs in exterior areas.
  - c. Tests for maximum dry density of compacted fill materials.
  - d. In-place field dry density tests for every 2,500 square feet of area of each layer of compacted subgrade fill under building slabs, other than drainage fill, as directed by Owner's Representative.
  - e. In-place field dry density tests, per ASTM D 1556 or ASTM D 2922 and D3017, for each layer of compacted fill under all footings, as directed by Owner's Representative.
  - f. If compaction is found to be unsatisfactory, extra in-place field dry density tests to determine the extent of recompaction work required.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

## 1.7 FIELD CONDITIONS

- A. Existing Conditions: The excavation contractor shall visit the site prior to submitting his bid in order to determine the existing conditions under which he will be obliged to operate and the extent of the site preparation work required.
- B. Existing Utilities:
1. Locate existing underground utilities in the areas of work before starting earthwork operations. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
  2. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the Owner's Representative immediately as to how to proceed.
  3. Do not interrupt existing utilities serving facilities occupied or used by the Owner or others, except when permitted in writing by the Owner's Representative and then only after acceptable temporary utility services have been arranged.
  4. Demolish and completely remove from the site underground utilities indicated to be removed. Coordinate with local utility companies for shut-off and capping or sealing of services if lines are active.
- C. Explosives: The use of explosives will not be permitted.

## 1.8 PROTECTION OF PERSONS AND PROPERTY

- A. Barricade open excavations made as a part of earthwork operations and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
- B. Protect benchmarks and existing structures, roads, sidewalks, paving and curbs against damage from vehicular or foot traffic.
- C. Protect from frost the bottoms of excavations and soils around and beneath foundations.

## 1.9 BRACING, SHEETING AND SHORING

- A. Provide bracing, sheeting and shoring for the sides of excavations as necessary to prevent movement or settlement of adjacent structures, utilities, roads and streets, etc. The cost of bracing, sheeting and shoring required shall be deemed to have been included as part of the Contract Sum.
- B. The Contractor shall be entirely responsible for the strength and adequacy of all such bracing, sheeting and shoring, and is liable for any damage or injury caused by or resulting from improperly supported soils and structures. He shall, if required, submit fully detailed Shop Drawings for review prior to placement; however, such review shall not diminish the Contractor's responsibilities in any way.
- C. The Contractor shall issue any notices to owner of adjoining property that may be required by any pertinent laws or ordinances. Furnish copies of such notices to Owner's Representative.
- D. If the safety of any adjacent structures, utilities, etc., shall appear to be endangered, take all proper means to support such embankments, structures, utilities, etc., and notify the Owner. Do not resume operation without the Owner's permission.
- E. Provide and place bracing and shoring ordered by the Owner when necessary to safeguard adjacent buildings, etc. If the Contractor fails to comply promptly when so ordered, the required bracing and shoring may be placed by order of the Owner at the Contractor's expense. Any such action shall not relieve the Contractor of responsibility for the bracing and shoring or liability for damage.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. Fill Materials: Shall be obtained from excavations on the site, provided the material meets the following requirements and is approved by the testing lab. Fill material from offsite shall be obtained from borrow pits approved by the testing lab.
- B. Fill Supporting Footings: Well graded granular material, sand or gravel, tested by the testing laboratory. Not more than 10% shall pass #200 sieve; except that fill placed during wet weather or in wet areas shall have no more than 5% passing #200 sieve. Cohesive soils from excavations on the site may be used provided they can be compacted to 95% of maximum density as determined by ASTM D 1557-78.

- C. Fill Under Interior Floor Slabs, UP TO Drainage Course: Granular material of friable earth, or clay of low plasticity, tested by the testing laboratory.
- D. Drainage Fill Directly Under Interior Floor Slabs: Natural hard, clean sand; or naturally or artificially graded mixture of crushed gravel or crushed stone acceptable to the Owner's Representative and the testing service.
- E. Fill Under Concrete Pads and Stoops: Granular fill, the same as used for footings.
- F. Other (Ordinary) Backfill and Fill: Reasonably uniform soil materials free of organic or frozen material, debris, trash, and of stones 4" or greater in diameter. Soils from excavations on site may be used provided they can be compacted to the densities specified.

### PART 3 - EXECUTION

#### 3.1 SITE CLEARING

- A. General:
  - 1. Except as otherwise indicated, remove trees, shrubs, grass, weeds and other vegetation, improvements, or obstructions that directly interfere with installation of new construction. Remove tree stumps and remove roots projecting above surface of finish grade.
  - 2. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct facilities to be constructed. Do not remove branches and roots for the convenience of construction operations except as approved by Owner for each tree. After cutting branches and roots, immediately apply an approved wound dressing.
- B. Topsoil Removal: Strip topsoil from areas to be excavated for construction. Remove heavy growths of grass from areas before stripping.
  - 1. Remove topsoil down to subsoils.
  - 2. Where trees are indicated to be left standing, stop topsoil stripping a sufficient distance from such trees to prevent damage to the main root system.
  - 3. Topsoil which has been removed without intermingling with other soils and is reasonably free of clay lumps, stones, and other objects over 2" in diameter, and without weeds, roots, and other objectionable material, shall be stockpiled for completion of the work. Topsoil not meeting these criteria may only be used for landscape work and shall be stockpiled separately or removed from the site.
  - 4. Construct stockpiles so as to drain precipitation freely. Cover storage piles as required to prevent wind-blown dust and erosion.

#### 3.2 WATER CONTROL

- A. Grade around excavated areas so as to prevent water from running into trenches, areas for slabs-on-grade and excavations; and grade so as to prevent water from running onto adjacent properties or public thoroughfares.



- B. Keep excavations dry with pumps, piping and temporary drains until backfilling is completed.
- C. Do not discharge drainage water lines into municipal sewers without municipal approval.
- D. Ensure that water discharge does not contain silt.

### 3.3 EXCAVATION

- A. General: Excavate for all work to elevations and dimensions indicated, plus sufficient space to permit erection and installation of forms for footings and foundation walls.
  - 1. Notify testing lab and Owner of all unexpected sub-surface conditions. Discontinue work in area until Owner provides notification to resume work.
- B. All subgrades for footing and building slabs shall be approved by the soils testing service. Give soils testing service adequate notice as to when excavations are scheduled to reach subgrade elevations shown on Drawings.
- C. Authorized Additional Excavation: If an unacceptable subgrade material is encountered at the subgrade elevation shown on the Drawings, the Owner may direct the Contractor to excavate to a greater depth by way of Change Order.
- D. Unauthorized Excavations: If an acceptable subgrade is encountered at the subgrade elevation shown on the Drawings and excavation goes to a greater depth, no additional payment shall be made by the Owner for such excavation nor for backfilling to repair the over excavation.
- E. Rock Excavation:
  - 1. Definition: Excavation of boulders or pieces of rock, concrete, or masonry measuring more than 1/2 cubic yard; or hard shale or solid ledge rock and masonry requiring continuous use of pneumatic tools or drilling to be removed.
  - 2. Contractor must demonstrate inability to remove by hand pick or by power excavator used for other excavation. Prior to removal, obtain written approval from Owner's Representative that material to be removed qualifies for extra payment.
- F. Protect footing and building slab excavations from freezing until excavations are completely backfilled.

### 3.4 FILLING AND COMPACTION

- A. General:
  - 1. Remove all debris from excavations before backfilling.
  - 2. No fill to be compacted shall be placed in free water, or on frozen ground.
  - 3. Manipulate and wet the fill materials as required to obtain uniform moisture content throughout. Fills shall be placed at +2% of the material's optimum moisture content. Mix lean to fat clays with lower plasticity clays and/or hydrated lime or lime byproduct materials as necessary to achieve required compaction values.

4. Prior to placement of fills under footings, slabs and pavings, the upper 12" of subgrade shall be brought to within 2% of optimum moisture and compacted to not less than 90% per Modified Proctor Method.
5. All subgrades shall be approved by the soils testing service just prior to placement of fills. Should subgrade become frozen, desiccated, saturated or disturbed, remove the affected material, or scarify, moisture condition and recompact the affected materials. Notify soils testing service well ahead of when excavations are scheduled to reach the subgrade elevations required.
6. Proofroll after placement of fill to verify compliance.

**B. Placing Fill to be Compacted:**

1. Placement: Place fill material in layers not exceeding 8" in thickness, starting in the deepest area and progressing approximately parallel to the finished grade.
2. Testing Between Layers: Compaction of each layer shall be tested as specified. Obtain approval from Owner's Representative before next layer of fill is started.
3. Drainage Course Under Interior Concrete Slabs On Grade: Install a layer of the specified granular fill 6" thick, such that, after compaction, the top of the fill will be at the bottom elevation of the slab as indicated by the Drawings, plus 0", minus 1/2".
4. Fill Under Exterior Platform Slabs: Extend granular fill down to bottom of platform foundation.

**C. Compaction Procedures:**

1. Compact the soils immediately after placement, while they retain their optimum moisture content; otherwise, manipulate and wet the soil as required to obtain the required moisture content uniformly throughout.
2. Suspend compaction operations when proper results cannot be obtained because of rain or soggy conditions, or when other conditions are unsatisfactory.
3. Compact with vibratory compaction and/or rolling equipment to the specified densities. Compaction by travel of grading equipment will not be considered adequate. Use small vibratory or hand tamping compactors whenever fill is placed adjacent to walls or around footings and columns.
4. Each layer of fill shall be compacted all across its surface to the required density before additional fill may be placed.
5. If compaction is found to be unsatisfactory, recompact until required density is achieved.

**D. Compaction Densities:**

1. Granular Fill Under Footings, Building Slabs and Exterior Platforms: 95% of maximum density, per Modified Proctor Test (ASTM D 1557).
2. Cohesive Soil Fills Within Perimeter of Building Foundations: 95% of maximum laboratory density, per Modified Proctor Test (ASTM D 1557).
3. Fills To 10 Feet Outside of Building Perimeter: 95% of maximum density, per Modified Proctor Test (ASTM D 1557).

E. Replacement of Over-Excavation:

1. Where over-excavation has been authorized, provide approved granular fill to replace the materials excavated from below the designated design subgrade and compact the fill to the required densities. Payment for such additional work will be in accordance with the established unit prices.
2. When authorized over-excavation causes the width of the excavation to be increased, fill the excavation to the extended width with the appropriate fill materials and compact the fill to the required densities. Payment for the additional fill work required will be in accordance with the established unit prices.
3. Where over excavation has not been authorized, fill with granular fill compacted to the required density at the required elevation without additional payment.

3.5 ROUGH GRADING

- A. General: Uniformly grade new filled areas, including adjacent transition areas, and as otherwise indicated within the limits of construction. Include any areas disturbed by construction operations.
1. Smooth the finished surfaces within specified tolerances, with uniform levels of slopes between points where elevations are shown, or between such points and existing grades.
  2. The degree of finish required will be that ordinarily obtainable from either blade-grader or scraper operations.
- B. Interior of Building: Rough grade the areas under slabs-on-grade to not less than 6" nor more than 6-1/2", plus the slab thickness, below finish floor line. Grade the surface so as to be free from irregular surface changes.

3.6 MAINTENANCE

- A. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.
- B. Protection of Graded Areas: Protect newly graded areas from traffic and erosion, and keep free of trash and debris.
1. Repair and re-establish grades in settled, eroded, and rutted areas to the specified tolerances.
  2. Any settlement of areas shall be filled level and smoothed out, and shall be repaired so as to maintain the required grade level for a period of one year.

3.7 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Remove excavated material unsuitable for fill or backfill from Owner's property before backfill operations begin. After backfilling is completed, remove from Owner's property all excess fill material.
- B. Areas under stockpiles not indicated as receiving new construction shall be restored to original condition.

- C. All off-site hauling shall be in tight beds such as to prevent spilling onto streets or highways. Use drip pans where necessary to prevent spilling. Off-site haul routes shall be approved by the appropriate county and city authorities for disposal of wastes from this contract.
- D. All excess material removed from site shall become the property of the Contractor. Legally dispose of all materials removed from the site.

END OF SECTION 312000