MINNEAPOLIS PUBLIC HOUSING AUTHORITY
MN2-23
2019 EXTERIOR REPAIRS

315 LOWRY AVE N
MINNEAPOLIS, MINNESOTA

Project Consultant

Encompass
engineering consultants
forensic analysis

I hereby certify that this plan, specifications or report was prepared by me or under my direct supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

	2/12/2019	46738
Emily Stevens, P.E.	Date	Registration

Encompass, Inc.
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ENC Project: 18-4868-02C

February 12, 2019

Project Manual for Construction Bid

PROJECT MANUAL TABLE OF CONTENTS

SUMMARY OF WORK
Section 01 11 00

1.0 GENERAL

1.1 Applicable Documents

A. Bidding Requirements, Conditions of the Contract and pertinent Sections in Division 01 apply to the work of this Section.

1.2 Summary

A. This Section includes the following:

1. Work covered by the Contract Documents.
2. Work sequencing.
3. Use of premises.
4. Owner's occupancy requirements.
5. Work restrictions.
6. Project Manual formats and conventions.

1.3 Project Identification

A. Project Name: MN2-23 – 315 Lowry Ave N
Minneapolis, Minnesota
2019 Exterior Repair Project

B. Owner: Minneapolis Public Housing Authority (MPHA)

C. Owner PM: MPHA
1001 Washington Ave N
Minneapolis, MN 55401
Roderic Bolen – 612-342-1233

D. Project Engineer: Encompass, Inc.
5435 Feltl Road
Minnetonka, Minnesota 55343
Emily Stevens – 952-854-4511

1.4 Summary of the Work

The Work of this single prime Contract can be summarized as follows. Reference drawings and details for additional information.

All bid quantities are estimated and actual quantities completed may be higher or lower than bid quantities based on conditions discovered during construction. Payment to contractor is based on the actual quantities of work completed, calculated using the unit prices for each work item provided in the bid form.

A. Base Bid Items Description:

1. **Remove and Replace Metal Panel System on West Elevation:** Remove all metal panels, fasteners, channels, and other accessories from the west elevation. Inspect stucco surface behind the panels. Remove any loose stucco and patch stucco. Install new prefabricated metal panel system as shown in details on drawing sheet 6. Install and integrate a metal flashing and self-adhered membrane with end dams at floor lines where shown on drawings. Color and finish to be selected by MPHA.

   Base Bid quantity for **Remove and Replace Metal Panel System on West Elevation: 1,500 square feet (2 Locations)**

2. **Remove and Replace Metal Panels on North and South Elevations:** Remove all metal panels, fasteners, sealant, backer rod, and other accessories from the floor lines at the north and south elevations. Install sealant and backer rod at space between brick and concrete at floor lines. Install new metal flashing over the window heads below. Install self-adhered flashing membrane up to window sill above. Wrap membrane flashing onto brick substrate at jamb to create full height end dams. Install vertical support channels at either jamb to provide support for new metal panels. Install new metal panels as detailed on sheet 6. Color and finish to be selected by MPHA. Install backer rod and sealant at perimeter of new panels.

   Base Bid quantity for **Remove and Replace Metal Panels on North and South Elevations: 230 square feet (2 Locations)**

3. **Remove and Replace Damaged Metal Infill Panels:** At the locations shown on the drawings, remove damaged infill metal panels and gaskets from the window system. Carefully remove window system components as needed to access metal infill panels, and save for re-use. The metal panels are visible from the interior of the building. Replace the metal infill panels with new panels and gaskets to match the original color and finish, and reassemble the window system components.

Base Bid quantity for **Remove and Replace Damaged Metal Infill Panels: 36 square feet (4 Locations)**

4. **Wet Seal All Hallway Window and Infill Panel Perimeters:** At all hallway window/panel banks on the north, south, and east elevations, cut off exposed gasket and wet seal the perimeters of the windows and the perimeters of the infill metal panels. Sealant color to be selected by MPHA.

   Base Bid quantity for **Wet Seal All Hallway Window and Infill Panel Perimeters: 3,250 linear feet**

5. **Partial Sealant Replacement:** Remove and replace sealant joints located at the perimeters of the hallway window/panel systems on the north, south, and east sides of the building. Sealant should be removed and replaced to match existing joint shape and configuration. Sealant color to match existing, subject to approval of installed mockup by owner.

   Base Bid quantity for **Partial Sealant Replacement: 1,850 linear feet**

6. **Rigging:** Provide all labor, material, plant, equipment, rental and all else necessary for the complete installation of a temporary system of swing stage scaffolding, and/or other suitable means, necessary to access the building façade and to execute the work activities required in the scope of the project. Sufficient scaffolding shall be provided to access the entire façade. Contractor shall have the full responsibility for the design, safety, installation, operation, relocation, final removal, and all else required for the complete execution of the project.

   If swing stage scaffolding or other suspended rigging is used, contractor shall provide complete temporary or permanent fall protection system meeting the requirements of OSHA Chapters 1926.500, 1926.501, 1926.502, and 1926.503, and MN OSHA 5205.0730. In accordance with MN OSHA 5205.0730, all anchorages shall be certified by an engineer. There are currently no certified anchor points on the building. A certified anchorage plan shall be submitted to Encompass for approval prior to beginning work.

7. **Mobilization/Demobilization:** Provide all labor, material, equipment, permits, temporary utilities and facilities, health and safety devices and procedures, waste storage and disposal facilities and all else required and necessary to complete the work. When the project is completed, remove all temporary equipment, facilities, and devices from the structure and site and restore the structure and site to its original condition to the satisfaction of the owner and engineer.
   Base Bid quantity for **Mobilization/Demobilization: LUMP SUM**

B. Unit Price Items Description:

U1. Miscellaneous Labor: Provide man hours for unspecified work activity as directed and preapproved by the Engineer. This work item is to provide for any contingent activity unanticipated in the scope of the project. Price shall be the total charge assessed for actual labor hours required and shall include the total cost of labor, tools, scaffolding, plant, equipment, and all else required to perform the labor, including overhead and project. Any material required to be installed by this labor shall be provided by the owner, or per executed change order by the contractor. A secondary use of these hours would be contractor personnel time spent assisting with Engineering observation. Contractor shall itemize quantity and activity for miscellaneous labor hours used to receive payment.

Base Bid quantity for **Miscellaneous Labor: 40 HRS**

C. Keep Engineer and Owner fully informed about progress of the work, performance of the work and potential problems.

1.5 Work Sequencing

A. Start submittal process immediately upon contract award by the Owner.

B. The Work shall be conducted according to the following schedule:

1. Start Date: April 15, 2019_____
2. Substantial Completion: July 15, 2019_____
3. Project Closeout Documents: July 30, 2019_____

C. Misc.

1. The contractor shall maintain all public entries at all times.

2. The contractor shall provide the engineer with access to the building via the contractor's swing stage and/or scaffolding periodically to observe material installation and restoration work.

1.6 Use of Premises

A. General: Contractor shall have limited use of premises for construction operations only.

1. Contractor is to visit site and be familiar with existing conditions. Contractor will be required to accept existing conditions on site prior to mobilizing.

B. Use of Site:

1. Owner Occupancy: Allow for Owner occupancy of Project site and use by the public.

2. Driveways and Entrances: Keep driveways, loadings 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 use of driveways and entrances.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment onsite.
    c. Coordinate schedule to maintain Owner's access to loading dock.
    d. Onsite storage of equipment, materials, and dumpsters shall be coordinated with owner.

3. Public Streets: Maintain clear of automobile parking, equipment or material storage unless arrangements have been made with the appropriate jurisdiction.

4. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.

C. Do not allow construction waste and debris to accumulate; remove debris as it accumulates and, unless specified otherwise, dispose of legally off-site.

D. Conform to City's noise control regulations, including limited hours of construction operations.

E. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

F. Scheduling of potentially disruptive noise producing activities shall include the Owner or their representative and shall be scheduled in advance of the activity.

1.7 Owner's Occupancy Requirements

A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period. 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 hour's notice to Owner of activities that will affect Owner's operations.

1.8 Work Restrictions

A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupies by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than seven (7) days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Engineer's or Owner's permission.
3. The day and time of any existing utility interruptions will be approved at the sole discretion of the Owner, with such approval not unreasonably withheld.

B. The contractor shall comply with all OSHA standards for worker safety and occupant safety regarding sound levels.

1.9 Project Manual Formats And Conventions

A. Project Manual Format: The Project Manual is organized into Divisions and Sections using the 49-division format and CSI/CSC's "Master Format" numbering system.

1. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Project Manual.

B. Project Manual Content: The Project Manual uses certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Project Manual and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense required. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Project Manuals. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words “shall,” “shall be,” or “shall comply with,” depending on the context, are implied where a colon (:) is used within a sentence or phrase.

END OF SECTION 01 11 00

UNIT PRICES
Section 01 22 00

1.0 GENERAL

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Project Manual Sections, apply to this section.

1.2 Summary

A. This Section specifies administrative and procedural requirements for unit prices.

B. A unit price is an amount proposed by Bidders and stated in the Pricing Items as a price per unit of measurement for materials or labor services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of work included in the Contract Documents are increased or decreased due to conditions discovered during construction. Payment to contractor is based on actual quantity of work completed, and not bid quantity.

C. The Owner may request a unit price for substantial changes on the quantity or scope of the work at any time throughout the course of the project.

D. Where a unit price is not requested in the Pricing Items and a substantial change in the quantity of the work is required by the Owner, a unit price may be established between Owner and Contractor that will govern the amount of contract change provided the Contractor by the Owner.

E. Unit prices shall include all necessary materials, overhead, profit, and applicable taxes.

F. Refer to individual Project Manual Sections for construction activities requiring the establishment of unit prices. Methods of measurement and payment for unit prices may be specified in those Sections.

G. In the event that a unit price for increases or decreases in the scope of the work cannot be agreed upon between the Owner and Contractor, a unit price shall be established by dividing the accepted cost of the work by the quantity of work shown on the drawings and/or specified by the Project Manual.

H. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this Work measured by

an independent surveyor acceptable to both the Owner and the Contractor at the Owner's expense.

END OF SECTION 01 22 00

PRODUCT OPTIONS AND SUBSTITUTIONS
Section 01 25 00

1.0 GENERAL

1.1 Summary

A. Specified Products or Method – Base all bids on providing all products or method exactly as specified.

B. For products or method specified only by reference or performance standards, select any product which meets or exceeds standards, by any manufacturers, subject to the Engineer's approval and in accordance with the terms of the Agreement between Owner and Contractor.

C. For products or method specified by naming several products or manufacturers, select any product and manufacturer named.

D. Where the phrase "or equivalent" occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically approved for this Work by the Engineer. Requests for approval must be made in accordance with Paragraph 1.3 of this section. The decision of the Engineer shall be final.

1.2 Substitutions, Bidder/Contractor Options

A. Prior To Bid Opening: The Engineer will consider written requests to amend the bidding documents to add products or method not specified provided such requests are received no later than the question deadline. When a request is approved, the Engineer will issue an appropriate addendum not less than 7 calendar days prior to the bid opening date.

1.3 Substitution Requirements

A. Submit 1 copy of each request for substitution (if directed by submission requirements). Include in request:

1. Complete data substantiating compliance of proposed substitution with Contract Documents.
2. For products:
   - Product identification, including manufacturer's name and address.
   - Manufacturer's literature:
     -Product description
     -Performance and test data

-Reference standards
- Samples
- Name and address of similar projects on which product was used and date of installation.

3. For construction methods:
   - Detailed description of proposed method
   - Drawings illustrating methods.
4. Itemized comparison of proposed substitution with product or method specified.
5. Data relating to changes in construction schedule.
6. Identify:
   - Other contracts affected
   - Changes or coordination required.
7. Accurate cost data on proposed substitution in comparison with product or method specified.

B. In making request for substitution, bidder/contractor represents:

1. He has personally investigated proposed product or method and determined that it is equal or superior in all respects to that specified.
2. He will provide the same guarantee for substitution as for product or method specified.
3. He will coordinate installation of accepted substitutions into work, making all changes for work to be complete in all respects.
4. Cost data is complete and includes all related costs under his contract, but excludes:
   - Costs under separate contracts
   - Engineer's redesign
   - Administrative costs of Engineer.
5. He will assume full responsibility for all product reliability for Owner, Engineer, Construction Manager and other Contractors.

C. Substitutions will not be considered when:

1. They are indicated or implied on shop drawings or product data submittals without formal request submitted in accordance with Paragraph 1.3.
2. Acceptance will require substantial revision of Contract Documents.

END OF SECTION 01 25 00

CHANGE ORDERS
Section 01 26 63

1.0 GENERAL

1.1 Change Order Procedures

A. Changes in the Project scope of work affecting the project cost can be made only through a Supplemental Agreement.

B. The procedures for processing changes in the scope of Work are listed as follows:

1. The Engineer prepares one of the following documents to modify the scope of work.

a. Supplemental Instructions (SI) which are used for no cost changes.

b. Proposal Request (PR) to be used for proposed changes that need written approval on cost prior to proceeding.

c. Construction Change Directive which is used when the work must proceed immediately and time and material cost submitted as soon as possible for review by the Engineer.

2. The Contractor reviews and responds as follows:

a. Supplemental Instructions (SI): this no cost change is to be carried out in accordance with the following modifications to the contract documents described herein. If this change effects cost, do not proceed with this change. Notify the Engineer in writing within 10 days of receipt that an itemized (labor and material) quotation will be submitted within 21 days of initial receipt of this Supplemental Instruction. If a cost is not submitted within 21 days, this Supplemental Instruction will be accepted at no additional cost.

b. Proposal Request (PR): Submit an itemized (labor and material) quotation for the proposed modifications to the contract documents as described herein within 21 days of receipt. If a cost is not submitted within 21, this Proposal Request can be accepted at no additional cost. Written approval is required prior to proceeding with this change.

c. Construction Change Directive: Proceed immediately to carry out this change in the contract documents as described herein. If this revision effects cost, submit

an itemized (labor and material) quotation within 21 days of receipt. If a cost is not submitted within 21 days this Change Directive will be accepted at no additional cost.

3. The Engineer will review the Contractor's labor and material itemized quotation and respond in writing whether it is acceptable or needs revision. When all pricing is accepted by the Engineer and Owner, a Supplemental Agreement will be processed. Supplemental Agreements will be processed at increments determined by the Engineer throughout the construction schedule.

C. See General Conditions and Supplementary Conditions of the Work for methods of determining cost or credit, mark-up and schedule on submitting claims.

END OF SECTION 01 26 63

PROJECT MEETINGS
Section 01 31 19

1.0 GENERAL

1.1 Summary

The Engineer will administer preconstruction meetings and weekly progress meetings. The Contractor or his designee shall attend these meetings The Engineer shall:

1. Preside at meetings.
2. Record minutes; include significant proceedings and decisions, distribute minutes to attendees, the Owner and the Contractor.

1.2 Preconstruction Meeting

A. Schedule within 15 days after Date of Notice to Proceed.

B. Attendance: Contractor, Separate Contractors, if any, Prime Subcontractors, Engineer, Engineer Consultants and Owner's representative.

C. Agenda to Include:
   1. Discuss Contractor's list of all subcontractors and tentative construction schedule.
   2. Critical work sequencing.
   3. Relation and coordination of contractors.
   4. Designation of responsible personnel.
   5. Processing of field decisions and change orders.
   6. Submittal of shop drawings, product data and samples.
   7. Procedures for maintaining record documents.
   8. Use of site including office and storage areas.
   9. Major equipment deliveries and priorities.
   10. Safety and first-aid procedures.
   11. Security procedures.
   12. Housekeeping procedures.
   13. Working hours, work days.
   14. Utilities.

1.3 Weekly Progress Meetings

A. Hold regular weekly and called meetings as progress of work dictates.

B. Location of Meetings: Field office at the site or Owners representative office at the side.

C. Attendance: Contractor, Subcontractors as pertinent to agenda and Engineer's representatives.

D. Minimum Agenda:
   1. Review work progress since last meeting.
   2. Note field observations, problems and decisions.
   3. Identify problems which impede planned progress.
   4. Review off-site fabrication problems.
   5. Develop corrective measures and procedures to regain schedule.
   6. Coordinate projected progress with other prime contractors.
   7. Review submittal schedules, expedite as required to maintain schedule.

END OF SECTION 01 31 19

PROGRESS SCHEDULES
Section 01 32 00

1.0 GENERAL

1.1 Requirements Include

A. Contractor submit proposed, detailed construction schedule for work to the Engineer not later than 5 business days before preconstruction meeting.

B. Revise schedule weekly.

1.2 Related Requirements

A. Specified elsewhere:
1. Section 01 11 00 – Summary of Work
2. Section 01 31 19 – Project Meetings
3. Section 01 33 00 – Submittals

1.3 Form of Schedules

A. Prepare a standard horizontal bar chart as outlined below or by Job/Week classifications as approved by the Engineer.
1. Provide separate horizontal bar column for each class of work, activity or long-lead equipment item.
2. Order: Table of contents of Project Manual.
3. Identify each column:
   • By major Project Manual section number.
   • By distinct graphic delineation.
4. Horizontal time scale: Identify first work day of each month.
5. Scale and spacing: To allow space for updating.

B. Sheet size:
1. Minimum: 8.5 x 11 inches
2. Maximum: 42 x 30 inches

1.4 Content of Schedules

A. Indicate complete sequence of construction by activity.
1. Shop drawings, product data and samples: In accordance with Section 01 33 00.
   • Submittal dates.
   • Dates when reviewed copies will be required.
2. Decision dates for: Selection of submittals.
3. Product procurement date, fabrication time and delivery dates.

4. Dates for beginning, and completion of, each element of construction.

B. Identify work of separate floors, or separate phases, or other logically grouped activities.

C. Indicate cumulative percentage of work completed as of first day of each month.

D. Furnish separate schedule, showing submittals, review items, procurement schedules and delivery dates specified in 1.3.A.

E. Define critical portions of entire schedule.

1.5 Updating

A. Update weekly. Indicate:
1. Progress of each activity since previous submission.
2. Projected completion dates for all activities.
3. Activities modified since previous submission.
4. Changes in usage of terraces by suite number.

B. Compare projected completion dates to previous submission. State when behind, on, or ahead of previous problem.

C. Include:
1. Major changes in scope.
2. Revisions in duration of activities.
3. Other identification changes.

D. Furnish narrative report, including:
1. Discussion of problem areas, including current and anticipated delay factors, and their impact.
2. Corrective action taken, or proposed, and its effect.
3. Description of revisions.
4. Effect of change in schedules of other contractors.
- Effect of schedule due to change in scope.
- Other changes that may affect schedule.

1.6 Submittals

A. Submit initial schedules not later than 5 business days before date of preconstruction meeting.
1. Engineer and Owner will review schedules and return reviewed copy within 10 business days after receipt.
2. When directed, resubmit within five business days after return of reviewed copy.

B. Submit monthly updated schedules accurately depicting progress to first day of each month.

C. Submit the number of copies required by Contractor, plus two copies to be retained by Engineer and two copies to the Owner. Furnish additional copies when directed.

1.7 Distribution

A. Distribute copies of reviewed schedules to:
   1. Jobsite
   2. Contractor
   3. Subcontractors and suppliers on as-needed basis.
   4. Engineer
   5. Owner

B. Instruct recipients to report inability to comply with projected completion dates, and to furnish a detailed explanation together with suggested remedies.

END OF SECTION 01 32 00

SUBMITTALS
Section 01 33 00

1.0 GENERAL

1.1 Summary

The Conditions of the Contract (General, Supplementary and other Conditions) and the General Requirements apply to this Section.

A. This section governs the submission of shop drawings, product data and samples to the Engineer as required by Project Manual Sections and as specified herein.

B. Related requirements specified elsewhere:
   1. Section 01 77 00 – Project Closeout
   2. Section 01 78 39 – Project Record Documents

2.0 REQUIREMENTS

2.1 Shop Drawings

A. Each shop drawing shall be identified with a title, the name of the manufacturer or fabricator, project, Contractor, Engineer and date. Each drawing of a set shall be numbered in sequence.

B. Shop drawings for items to be specially fabricated must show detail and materials sufficient to enable complete and correct shop fabrication. Shop drawings which are excessively general or simple recapitulation of Engineer's design drawings will not be accepted. Shop drawings must meet additional or special requirements listed in each section.

C. Manufacturer's standard printed informational sheets for manufactured items are acceptable provided they give all dimensional and utilities information necessary. Mark each copy to indicate the actual product to be provided; show selections from among options.

D. Reasonable promptness on the part of the Contractor means at a time sufficiently in advance to allow the Engineer's approval, manufacture or fabrication of the work, and delivery to the site so that installation shall conform to the approved Progress Schedule. Failure to comply with this requirement shall not be cause for extension of time.

E. Statement of approval shall be stamped on each shop drawing, dated and signed by the Contractor's representative. Failure to comply with this requirement shall be cause for the Engineer to reject the shop drawing and/or require resubmission.

F. The Engineer shall indicate how many copies of each shop drawing are required.

G. Shop drawings acceptable to the Engineer shall be stamped "Approved" or "Approved with Corrections as Noted." The Engineer shall sign, date, and return a copy of the Submittal to the Contractor.

H. Shop drawings not acceptable to the Engineer shall show cause for non-acceptance, be stamped "resubmit," signed and dated, and returned to the Contractor for necessary corrections.

I. All shop drawings as required by the Contract shall have final review and approval by the Engineer prior to ordering material, initiating fabrication, and commencement of work by the Contractor.

J. One copy of the approved drawings shall be maintained on the work site by the Contractor, unless otherwise indicated.

2.2 Product Data

A. General information required specifically as product data includes manufacturer's standard printed recommendations for application and use, compliance with recognized standards of trade associations and testing agencies, material safety data sheets (MSDS), and the application of their labels and seals (if any), special notation of dimensions which have been verified by way of field measurement, and special coordination requirements for interfacing the material, product or system with other work.

B. Product data submittal is required for information and record and to determine that the products, materials and systems comply with the provisions of the contract. The initial submittal of product information is, therefore, the final submittal, except where the Engineer observes that there is noncompliance with the provisions of the contract documents and returns the literature promptly to the Contractor requesting corrective submittal action.

C. Include standard printed information on materials, products and systems; not specially-prepared for the project, other than the designation of selections from among available choices printed therein.

D. All product literature submitted as required by the Contract shall have final review and approval by the Engineer prior to ordering material, initiating fabrication, or commencement of work by the Contractor.

2.3 Samples

A. Samples include both fabricated and unfabricated physical examples of materials, products and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Sample panels or mock-ups shall be prepared as instructed by the Engineer.

B. Provide units identical with final condition of proposed materials or products for the work. Include "range" samples where unavoidable variations must be expected, and describe or identify where Engineer/s selection is required. Prepare samples to match Engineer's sample where indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture, and "kind" by Engineer. Engineer will not test samples, except where otherwise indicated, for compliance with other requirements.

C. In the event of the Engineer's rejection of a sample panel, the Contractor shall remove and place another panel for review by the Engineer. This process shall continue until the sample panel or mock-up meets Engineer's approval, at which time work may proceed. Accepted sample panels shall be retained in an undisturbed condition, suitably marked, during construction as a standard for judging completed work.

2.4 Miscellaneous Submittals

A. Miscellaneous submittals related directly to the work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar information, devices and materials applicable to the work and not processed as shop drawings, product data or samples.

B. List of Subcontractors: Submit as indicated by the Contract, or within 10 days after signature of Contract if not specified therein.

C. Cost Breakdown of Contract Cost: Submit as indicated by the Contract, or within 10 days after signature of Contract if not specified therein.

2.5 Guarantees

Submit guarantees as outlined by the Contract and as soon as reasonably possible after work to be guaranteed is completed, but no later than time of request for inspection for Substantial Completion.

2.6 Reports

Submit reports promptly upon completed test or event, and at least 7 days prior to beginning subsequent work which is dependent upon results of reported test or event.

2.7 Schedules

Progress Schedule: Submit as indicated by the Contract, or within 10 days after signature of Contract if not specified therein.

2.8 Logs

The contractor shall produce and maintain a log of all submittals required for completion of work. The log shall be updated weekly in concurrence with project schedule.

2.9 Closeout Submittals

Refer to individual work sections and to Section 01 77 00, Contract Closeout, for specific requirements on submittal of closeout information, materials, tools and similar items.

END OF SECTION 01 33 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
Section 01 50 00

1.0 GENERAL

1.1 Summary

A. The Contractor shall be responsible for arranging for and providing all construction facilities and temporary controls as specified herein and as required for the proper and expeditious prosecution of the Work. The Contractor shall pay all costs for such facilities and controls unless otherwise specified, until date of substantial completion of Project.

B. Construction operations at the building site shall be in accordance with all applicable laws, governmental rules, and regulations.

1.2 Temporary Electricity

A. A temporary lighting system shall be furnished, installed and maintained by the Contractor directly or through its electrical subcontractor as required to satisfy minimum requirements for safety and security. The temporary lighting system shall afford general illumination at grade level where practical in areas around the building where Work is being performed under the Contract. The Contractor shall provide power distribution at 120/240 volts, 1 phase, 3-wire, 60 cycle, A.C. Convenience outlets for fractional horsepower tools such as saws, drills, etc., and extension cords shall be located at convenient points in each working area in such quantity as to permit 50-ft maximum extension cords to be used. Each outlet shall have two 120 volt, 15 ampere, 3-wire grounded duplex receptacles.

B. All temporary equipment and wiring for power and lighting shall be in accordance with the applicable provisions of the governing codes. All temporary wiring shall be maintained in a safe manner and utilized so as not to constitute a hazard to persons or property.

C. The contractor may use existing power sources located within the building for temporary equipment operation. It is the responsibility of the contractor to locate power sources and pay for all costs associated with connection and disconnection to the source.

D. The Owner may, but is not obligated to, supply the Contractor with a point of supply for his hook-up and electrical power, without cost to the Contractor. The Contractor shall be responsible for proper hook-up and maintenance of temporary electrical connections. The Contractor shall locate sufficient electrical circuits, protected by circuit breakers, to be certain that system overload shall not occur by Contractor's

equipment usage. The Contractor shall use only electrical equipment that is fused or protected by circuit breakers from Owner's electrical system.

1.4 Temporary Telephone Service

The Contractor shall provide telephone service as required for his use and that of all subcontractors and shall pay all charges for the installation, maintenance and removal of such service.

1.5 Temporary Water

A. The Contractor shall provide potable water for drinking and construction purposed for all parts of the work. All costs for arrangements, permits, installation maintenance and water shall be paid for by the Contractor.

1.6 Temporary Sanitary Facilities

The Contractor shall provide suitable and adequate temporary toilet facilities for entire work force. The number and type of such facilities shall conform with labor work rules, governing codes and health requirements. Unless otherwise required, portable chemical toilets shall be serviced weekly, such service to include emptying tanks, recharging with a germicidal and deodorizing solution and scrubbing entire interior with a germicidal solution.

1.7 Temporary Fire Protection

A. The Contractor shall prohibit all lighting of fires about the premises and all smoking in restricted areas where posted with "NO SMOKING" signs and shall use due diligence to see that such prohibition is enforced. "NO SMOKING" signs shall be furnished and posted by the Contractor or in the event of separate Contracts, by the General Contractor.

B. It shall be the responsibility of the Subcontractor to notify the General Contractor in advance of the work when welding or other fire hazardous work is to be performed so that proper precautionary measures may be taken to prevent fire.

C. Stove heaters in temporary offices and sheds shall be properly installed to protect combustible walls, floors and roof.

D. Salamander heaters or similar forms of uncontrollable heaters shall not be used except with the special permission of the Engineer and then only when each salamander is maintained under constant supervision.

E. Gasoline shall be kept and handled in approved safety cans.

1.8 Construction Aids

A. The Contractor shall provide all temporary ladders, ramps, runways stairs, scaffolding, staging, temporary enclosures, hoists, rubbish chutes, etc., as may be required for performance of the work. All construction aids shall comply with federal, state and local laws and regulation.

B. Temporary Enclosures:
   1. Temporary weather tight enclosures and temporary heating shall be provided by the Contractor as required during construction to make the building weather tight and insulated to protect the work from frost damage, and as necessary to ensure suitable working conditions for the construction operations of all trades. Where work is being conducted, the temperature shall be maintained as specified in various Sections of the Project Manual but not less than 45°F or as required by manufacture requirements of materials to be used during construction. Temporary enclosures shall remain in place until the work is substantially complete or until exterior temperatures are acceptable to project manual.

   2. If the permanent walls and windows are used, as temporary enclosures, they shall be protected at all times against damage and thoroughly cleaned upon completion. Any damaged parts, including glass, shall be satisfactorily repaired or replaced and left in perfect condition. Temporary doors shall be made of wood construction and shall be hinged, self-closing and locked.
   3. The work or any major portion thereof shall be considered substantially enclosed when, in the opinion of the Engineer, it has reached the stage where all sealant has been installed, alternate work items have been completed, and all exterior stone anchoring has been completed.

C. Temporary Floor Protection

D. The Contractor shall provide required tarpaulins, visqueen, padding or any other approved means of protection for all floor finishes during work. Repairs that become necessary due to any damage resulting from any part of the work is the responsibility of the Contractor.

E. The Contractor shall provide and maintain required barricades, protection and warning lights in good condition until the completion of the part of the work requiring such protection and then remove same. The Contractor shall be responsible for all acts and operations of his employees or Subcontractors including the neglect or failure to take proper safety precautions, and for all damages to persons or property in consequence of neglect or failure to take the necessary or required precautions.

F. All barriers shall comply with federal, state and local laws and regulations.

1.9 Material and Equipment

A. Protect all finished surfaces, including landscaping, underground utilities and tunnels and exterior finishes, jambs and soffits of all openings used as passageways or through which materials are handled, against any possible damage resulting from the conduct of work by all trades. Contractor is responsible for replacing/repairing any damaged landscaping, utilities, sprinklers, and tunnels.

B. All finished surfaces, including factory-finished and job-finished items shall be clean and not marred upon delivery of the building to the Engineer. The Contractor shall, without extra compensation, refinish such spaces where such surfaces prove to have been inadequately protected and are damaged.

C. Tight wood sheathing shall be laid under any materials that are stored on finished cement surfaces. Reinforced building paper "Seekure" (Sisalkraft) and plywood or planking must be laid over all types of finished floor surfaces in traffic areas and before moving any materials over these finished areas. Wheelbarrows, if used of such areas, shall have rubber tired wheels.

END OF SECTION 01 50 00

FINAL CLEANING
Section 01 74 10

1.0 GENERAL

1.1 Summary

Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to work in this Section.

1.2 Description of Work

Extent of work is ongoing throughout the project. The Contractor shall provide, but is not limited to, the following:

A. Maintain premises and adjacent properties free of waste, debris and rubbish caused by construction operations.

B. At completion of work or at such other times as directed by the Engineer, remove all waste, debris, rubbish, tools, equipment, machinery and surplus materials. Clean all sight-exposed surfaces.

1.3 Submittals

A. Manufacturer's recommendations for cleaning and removal or storage of specified products.

B. Proposed cleaning materials for products where manufacturer's recommendations are not specified.

1.4 Safety Requirements

A. The Contractor shall maintain project in accord with Occupation Safety and Health Administration (OSHA) safety and insurance standards.

B. Hazard Control
   1. Store volatile wastes in an approved manner or remove from premises daily.
   2. Prevent accumulation of wastes which create hazardous conditions.
   3. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with federal, state and local anti pollution laws.
   1. Rubbish and waste materials shall not be burned or buried on project site.

2. Volatile wastes such as mineral spirits, oil or paint thinner shall not be disposed of into storm of sanitary drains.

2.0 PRODUCTS

2.1 Materials

A. Select and use all cleaning materials and equipment with care to avoid scratching, marring, defacing, staining or discoloring surfaces cleaned.

B. Use only cleaning materials recommended by manufacturer of surface to be cleaned, or as directed by the Engineer.

3.0 EXECUTION

3.1 Clean-Up Requirements

A. General
1. Contractor shall coordinate all final cleaning activities with owner.
2. Execute cleaning to ensure that building, grounds and public properties are maintained free from accumulations of waste materials and rubbish.
3. Wet down materials and rubbish to lay dust and to prevent blowing dust.
4. Daily, during progress of Work, clean site and public properties and dispose of waste materials, debris and rubbish.
5. Provide on-site transportable cart containers for collection of waste, materials, debris and rubbish as required.
6. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off site.
7. Handle materials in a controlled manner with as few handlings as possible. Materials shall not be thrown from heights.
8. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

B. Final Cleaning of Work areas
1. Employ experienced workmen, or professional cleaners, for final cleaning.
2. In preparation for Substantial Completion, or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.
3. Remove grease, dust, dirt, stains, labels and other foreign materials from sight-exposed interior and exterior surfaces.
4. Clean hard-surfaced finishes to a dust-free condition. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
5. Clean transparent materials, including exterior glass in doors and windows. Remove putty and other substances which may have been used and are

noticeable as vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials caused by construction.

6. Wipe surfaces of mechanical and electrical equipment clean. Remove excess lubrication and other substances.
7. Clean the project site, including landscape areas, of rubbish, litter and foreign substances as a result of the work.
8. Clean any area or item which may have become soiled or stained as a result of the work to its original condition.

C. Removal of Protection – Except as otherwise indicated or directed by the Engineer, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work or pedestrian traffic.

3.2. Compliance

Comply with safety standards and governing requirements for cleaning operations. Do not burn waste materials on the site. Do not bury debris or excess materials on the site. Do not discharge volatile or other harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

END OF SECTION 01 74 10

CONTRACT CLOSEOUT
Section 01 77 00

1.0 GENERAL

1.1 Summary

A. Comply with requirements stated in Conditions of the Contract and in Project Manual for administrative procedures in closing out the Work.

B. Related requirements in other parts of the Project Manual: Fiscal provisions, legal submittals and additional administrative requirements, Conditions of the Contract.

C. Related requirements specified in other sections
1. Section 01 33 00 – Submittals
2. Section 01 74 10 – Final Cleaning
3. Section 01 78 39 – Project Record Documents

1.2 Substantial Completion

A. Contractor:

1. Submit written declaration to Engineer that project, or designated portion of project, is substantially complete.
2. Submit list of items to be completed or corrected.

B. Owner, Engineer, and other necessary parties will make preliminary inspection within seven days after receipt of Contractor's declaration.

C. Should Owner and Engineer consider that work is substantially complete:

1. Engineer will prepare a punch list of items to be completed or corrected, as determined by the inspection.
2. Engineer will prepare and issue a Certificate of Substantial Completion, containing:
   • Date of Substantial Completion (in which will be the start of the warranty period).
   • Punch list of items to be completed or corrected which Contractor shall complete within 7 days unless noted otherwise
   • Date of time Owner will assume possession of Work or designated portion thereof.
   • Responsibilities of Owner and Contractor for:
     - Insurance
     - Utilities

- Operation of mechanical, electrical and other systems
- Maintenance and cleaning
- Security.

3. Contractor: Complete Work listed for completion or correction, within designated time.

D. At time of inspection, should substantial completion not be certified, complete the Work and resubmit declaration in accordance with item 1.2A.

1.3 Final Inspection

A The Contractor shall submit written declaration to Owner and Engineer that:

1. All aspects of the Contract Documents have been complied with.
2. All items on substantial completion punch list have been completed.
3. All tools, construction equipment and surplus materials have been removed from site.

B. The Contractor with Owner, Engineer and all necessary parties will make final inspection to ensure completion of all contract requirements.

C. When the Engineer and Owner finds that the Work is acceptable under the Contract Documents, he shall request preparation of closeout submittals.

1.4 Closeout Submittals to Engineer and Owner

A. Project record documents: Conform with Section 01 78 39.

B. Deliver evidence of compliance with requirements of governing authorities:

1. Certificates of inspection.
2. Certificates of occupancy.

C. Paid utility bills.

D. All other applicable documents and/or certificates.

1.5 Final Application for Payment

A. The Contractor shall submit the final application for payment in accordance with Contract Documents.

END OF SECTION 01 77 00

PROJECT RECORD DOCUMENTS
Section 01 78 39

1.0 GENERAL

1.1 Summary

A. Related requirements specified elsewhere:
   1. Section 01 33 00 – Submittals
   2. Section 01 77 00 – Project Closeout

1.2 Maintenance of Documents

A. Maintain at jobsite, one copy of:
   1. Contract drawings.
   2. Project Manual.
   3. Interpretations and supplemental instructions.
   4. Addenda.
   5. Reviewed shop drawings.
   6. Change orders.
   7. Other modifications to the Contract.
   8. Field test records.
   9. All schedules.
   10. Correspondence file.

B. Provide jobsite As-Built documents in clean and secure files and racks for document storage.

C. File Documents in accord with Project Filing Format of Uniform Construction Index.

D. Maintain Documents in clean, dry, legible conditions.

E. Record Documents shall not be used for construction purposes.

F. Make Documents available at all times for inspection by Engineer and Owner.

1.3 Marking Devices

A. Provide red ball-point pens for marking prints.

1.4 Recording

A. Label each Document "PROJECT RECORD".

B. Keep Record Documents current.

C. No part of the Work shall be permanently concealed until required information has been recorded.

D. Contract Drawings: Legibly mark to record actual construction:
   1. Field changes of dimensions and detail.
   2. Changes made by Change Order or Field Order.
   3. Details not on original Contract Drawings.
   4. Depths of various elements of foundation in relation to First Floor level.
   5. Horizontal and vertical location of underground utilities and appurtenances references to permanent surface improvements.
   6. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

E. Project Manual and Addenda: Legibly mark up each Section to record:
   1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
   2. Changes made by Change Order or Field Order.
   3. Other matters not originally specified.

F. Shop Drawings: Maintain as Record Documents; legibly annotate to record changes made after review.

1.5 Submittal

A. At completion of Project, deliver Record Documents in electronic format on digital media (CD, Thumb-drive, etc.) to the Engineer and Owner.

B. Accompany submittal with transmittal letter, in duplicate, containing:
   1. Date.
   2. Project title and number.
   3. Contractor's name and address.
   4. Title and number of each Record Document.
   5. Certification that each Document as submitted is complete and accurate.
   6. Signature of Contractor, or his authorized representative.

END OF SECTION 01 78 39

SELECTIVE DEMOLITION
Section 02 41 23

1.0 GENERAL

1.1 Section Includes

A. Related Documents.
B. Description of Work.
C. Submittals.
D. Job Conditions.

1.2 Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions and Specification sections, apply to work in this section.

1.3 Description of Work

A. Extent of selective exterior demolition work includes, but is not limited to, the following:

1. Portions of existing building and/or building components as indicated on drawings and as required to be removed and disposed of off site to accommodate new construction.

2. Removal and protection of existing fixtures, materials, and equipment items indicated as "salvage" or “reuse”.

B. Related work specified elsewhere:

1. Remodeling construction work and patching are included within the respective sections of specifications.

1.4 Submittals

A. Schedule – Submit schedule indicating proposed sequence of operations for selective demolition work to Engineer/Owner for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control.

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

2. Coordinate Owner's continuing occupation of portions of existing building with Owner's partial occupancy of completed new construction areas.

3. Coordinate with project phasing plan.

B. Photographs – Provide photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damaged related to removal operations. File with Engineer/Owner prior to start of work.

C. Product Data and Material Safety Data Sheets – Provide descriptive information for all product data or hazardous, highly odoriferous, or highly volatile materials to be used during demolition operations, along with procedure and safeguards to be followed during use of each.

1.5 Job Conditions

A. Occupancy – Conduct work in a manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's normal operations.

B. Condition of Structures – The Owner assumes no responsibility for actual condition of items or structures to be demolished. Conditions existing at time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, minor variations within the structure may occur by Owner's removal and salvage operations prior to start of selective exterior demolition work.

C. Partial Demolition and Removal – Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed. Storage or sale of removed items on site shall not be permitted.

D. Protection – Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective exterior demolition work.

1. Coordinate protective measures with other contractors performing work on project. Avoid duplication of work where practicable.

2. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of the building.

3. Erect temporary covered passageways as required by authorities having jurisdiction.

4. Provide exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.

5. Protect from damage existing finish work that is to remain in place and which becomes exposed during demolition operations.

6. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.

E. Damages – Promptly repair damages caused to adjacent facilities by demolition work.

F. Traffic – Conduct selective exterior demolition operations and debris removal to ensure minimum interference with roads, streets, walks, etc., and other adjacent occupied or used facilities. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

G. Utility Services – Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

1. Do not interrupt utilities serving occupied or used facilities or spaces, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner.

2. Maintain fire protection services during operations.

H. Environmental Controls – Use temporary enclosures and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution, or damage to finishes or occupied spaces.

I. Do not use highly odoriferous, hazardous or highly volatile chemicals during work without the approval of the Engineer/Owner. Provide appropriate safeguards during the use of such approved materials. Explosive materials are not permitted in performance of demolition work.

J. Proceed with selective exterior demolition work only when weather conditions are appropriate to safeguard laborers and public.

2.0 PRODUCTS

A. When chemical or abrasive materials are used for demolition purposes provide detailed product information, schedule of usage, hazards associated with the use of such chemicals, and measures to be taken protecting work site, pedestrians, adjacent building area, and any other element which may be affected by usage.

3.0 EXECUTION

3.1 Preparation

A. Protection shall be provided where required for areas near or adjacent to the demolition site. Temporary dust-proof barriers and barricades shall be erected where required both for protection of personnel, and for security, fire and weather protective reasons.

B. Every precaution against fire, employing fire department-hoses and portable fire extinguishers in accordance of government regulations and in Building Codes shall be taken.

3.2 Demolition

A. Pollution Controls

1. Water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level shall be used.

2. Water shall not be used when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

3. Compliance with governing regulations pertaining to environmental protection shall be maintained.

B. General Demolition

1. Those items and areas scheduled for demolition, as specified in the drawings and general contract shall be completely demolished and removed from the site within limitations of governing regulations.

2. Demolition shall be complete on each tier or floor before disturbing supporting members on lower levels or tiers.

3. Concrete and masonry shall be removed in small sections

3.3 Cutting and Patching

A. The Contractor, in accordance with shop drawings, Contract provisions, and upon Engineer/Owner's approval, shall cut openings in existing walls, fill in abandoned openings, and patch unfinished surfaces created by new construction and demolition.

B. Patching shall consist of rebuilding the area with the same materials as the surrounding surfaces, to the nearest sound undisturbed masonry joint or crack- and chip-free concrete surface. Prior to any cutting and patching work, the Contractor shall review with the Engineer/Owner the condition of the structure/surface and obtain approval to proceed with work.

3.4 Disposal of Demolished Materials

A. Debris, rubbish and other materials resulting from demolition operations shall be removed from site in accordance to governing regulations.

B. Items of salvageable value to Contractor may be removed from the structure as work progresses. Salvaged items shall be transported from the site as they are removed.

END OF SECTION 02 41 23

ALUMINUM-FACED COMPOSITE WALL PANELS
SECTION 07 42 43

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum-faced composite panels and mounting system for exterior application.

B. System Type for Exterior Application: Drained and back ventilated rain screen system.

1.2 RELATED SECTIONS

A. Section 07 62 00 – Sheet Metal Flashings.

B. Section 07 62 10 – Adhered Membrane Flashings

C. Section 07 92 13 – Sealant and Caulking.

1.3 REFERENCES

A. NFPA 285

B. American Architectural Manufacturers Association (AAMA):
1. AAMA 509 - Voluntary Test and Classification Method for Drained and Back Ventilated Rain Screen Wall Cladding Systems.
2. AAMA 620 - Voluntary Specification for High Performance Organic Coatings on Coil, Coated Architectural Aluminum.
3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
4. AAMA "Metal Curtain Wall, Window, Storefront and Entrance Guide Specifications Manual".

C. ASTM International (ASTM):
1. ASTM B 117 - Method of Salt Spray (Fog) Testing.
2. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
3. ASTM D 822 - Practice for Operating Light and Water Exposure Apparatus (Carbon-Arc Type) for Testing Paint, Varnish, Lacquer, and Related Products.
4. ASTM D 1308 - Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
5. ASTM D 1781 - Climbing Drum Peel Test for Adhesives.
6. ASTM D 1735 - Method for Water Fog Testing of Organic Coatings.

7. ASTM D 1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
8. ASTM D 2247 - Practice for Testing Water Resistance of Coatings in 100 percent Relative Humidity
9. ASTM D 2794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
10. ASTM D 3359 - Methods for Measuring Adhesion by Tape Test.
11. ASTM D 3363 - Method for Film Hardness by Pencil Test.
12. ASTM E 84 - Surface Burning Characteristics of Building Materials.
13. ASTM E 283 - Rate of Leakage through Exterior Windows, Curtain Walls, and Doors.
14. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors Under the Influence of Wind Loads.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00 - Submittals.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Affidavit certifying material meets requirements specified.
2. Manufacturer's literature for panel material, including dimensions, profiles, and finishes.
3. Preparation instructions and recommendations.
4. Storage and handling requirements and recommendations.
5. Installation methods and construction details.

C. Shop Drawings: Submit shop drawings showing project layout and elevations; fastening and anchoring methods; edge and corner conditions, detail and location of joints, sealants, and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.

D. Code Compliance: Documents showing product compliance with the national and local building code. ACM manufacturer shall have an ICC/ES Research Report and be in compliance with AC25 (Acceptance Criteria for Metal Composite Material).

E. Verification Samples:
1. Two samples of each type of assembly. 12 inches by 12 inches (304 mm by 304 mm) minimum.
2. Two samples of each color or finish selected. 3 inches by 4 inches (76 mm by 102 mm) minimum.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:
1. Composite Panel Manufacturer shall have a minimum of 5 years experience in the manufacturing of the panel product specified.

2. Composite Panel Manufacturer shall be solely responsible for panel manufacture and application of the finish.
3. Composite panel manufacturer shall have established a Certification Program acceptable to the local Code Authorities.

B. Installer Qualifications:
1. Fabricator/installer shall be certified/approved by the composite panel manufacturer.
2. Fabricator/Installer shall have a minimum 5 years experience of composite panel work similar in scope and size to this project.
3. Panel fabricator/installer shall assume sole responsibility for design and installation of the panel mounting components of the exterior panel system including, but not limited to attachment to sub-construction, panel to panel joinery, panel to dissimilar material joinery, and joint seal associated with the panel system.

C. Mock-Up: Provide a mock-up for verification of finish selections and to provide quality standards for fabrication and installation.
1. Location designated by Engineer. Approved mockup may become part of the completed work.
2. Do not proceed with remaining work until finished appearance and workmanship are approved by Engineer.
3. Rework mock-up area as required to produce acceptable work.
4. Approval of mockup does not constitute approval of deviations from the Contract Documents contained in mockup unless Engineer specifically approves such deviations in writing.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect finish and edges in accordance with panel manufacturer's recommendations.

B. Deliver, unload, store, and erect material in accordance with panel manufacturer's recommendations to prevent bending, warping, twisting, staining, denting, deformation, or other damage.

1.7 PROJECT CONDITIONS

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

B. Field measurements shall be taken prior to the completion of shop fabrication whenever possible. However, coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of work. Field fabrication may be allowed to ensure proper fit. Field fabrication shall be kept to an absolute

minimum with the majority of the fabrication being done under controlled shop conditions.

1.8 WARRANTY

A. Project Warranty: Minimum 5 year manufacturer's standard warranty for composite panels and finish.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, 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.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Alucobond, manufactured by 3A Composites USA, Inc. which is located at: 208 West 5th Street. Benton, KY 42025; Toll Free Tel: 800-626-3365

B. Acceptable Manufacturer: Alpolic Materials, which is located at: 401 Volvo Parkway, Chesapeake, VA 23320; Toll Free Tel: 800-422-7270

C. Substitutions: Approved equivalent must be submitted to engineer and approved prior to bidding.

2.2 PANELS

A. Composite Wall Panels: Alucobond Plus aluminum-faced composite panels as manufactured by 3A Composites, Alpolic fr aluminum-faced composite panels.
   1. Panel Thickness: 4 mm (0.157 inch) thick
   2. Composition:
      a. Factory-formed and assembled composite panels fabricated from two sheets of aluminum sandwiching a solid, fire resistant core.
      b. Aluminum Face Sheets:
         1) Thickness: 0.50 mm (0.02 inch) (nominal).
   3. Product Performance:
      a. Panel Tolerance:
         1) Length: -0 + .375 inch (+ 9.5 mm).
         2) Width: -0 + .188 inch (4.8 mm).
         3) Thickness: +/- .008 inch (0.20 mm) for 3 mm to 6 mm thicknesses.
         4) Bow (length and/or width): Maximum 0.8 percent.
         5) Squareness: Maximum .250 inch (6 mm).
      b. Bond Integrity:
         1) When tested for bond integrity, in accordance with ASTM D 1781 (simulating resistance to panel delamination), there shall be no

adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below the following values:

2) Peel Strength:
   a) 115 N mm/mm (22.5 in lb/in) as manufactured.
   b) 115 N mm/mm (22.5 in lb/in) after 21 days soaking in water at 70 degree F (21 degree C).

c. Temperature Resistance: Withstands environmental temperature changes from -55 degree F to +175 degree F (-50 degree C to 80 degree C). The coefficient of linear expansion is governed by the aluminum sheet.

d. Fire Performance:
   1) ASTM E84 Flame Spread Index must be less than 25, Smoke Developed Index must be less than 450
   2) ASTM D1929 A self ignition temperature of 650 degrees F or greater
   3) ASTM D635 Requires a CC1 classification
   4) NFPA285 Panels shall meet requirements of the Intermediate Scale Multi Story Test

2.3 FINISHES

A. Coil Coated Finishes:
   1. Coil coated in conformance with the following general requirements of AAMA 2605 and AAMA 620.
      a. 2-coat coil coated KYNAR 500 or HYLAR 5000 based Polyvinylidene Fluoride (PVDF).
   2. Color:
      a. Color as selected from manufacturer's standard color palette.
   3. Coating Thickness:
      a. Colors: 1.0 mil (+/-0.2 mil).
   4. Hardness: ASTM D 3363; HB minimum using Eagle Turquoise Pencil.
   5. Impact:
      a. Test method: ASTM D 2794; Gardner Variable Impact Tester with 5/8 inch (16 mm) mandrel.
      b. Coating shall withstand reverse impact of 1.5 inches/pounds per mil substrate thickness.
      c. Coating shall adhere tightly to metal when subjected to #600 Scotch Tape pick-off test. Slight minute cracking permissible. No removal of film to substrate.
   6. Adhesion:
      a. Test Method: ASTM D 3359.
      b. Coating shall not pick off when subjected to 11 inches by 11 inches by 1/16 inch (279 mm by 279 mm by 1.6 mm) grid and taped with #600 Scotch Tape.

7. Humidity Resistance
    a. Test Method: ASTM D 2247.
    b. No formation of blisters when subject to condensing water fog at 100 percent relative humidity and 100 degree F (38 degree C) for 4000 hours.
8. Salt Spray Resistance:
    a. Test Method: ASTM B 117; Expose coating system to 4000 hours, using 5 percent NaCl solution.
    b. Corrosion creepage from scribe line: 1/16 inch (1.6 mm) maximum.
    c. Minimum blister rating of 8 within the test specimen field.
9. Weather Exposure:
    a. Outdoor:
        1) Ten-year exposure at 45 degree angle facing south Florida exposure.
        2) Maximum color change of 5 Delta E units as calculated in accordance with ASTM D 2244.
        3) Maximum chalk rating of 8 in accordance with ASTM D 4214.
        4) No checking, crazing, adhesion loss.
    b. Chemical Resistance:
        1) ASTM D 1308 utilizing 10 percent Muriatic Acid for an exposure time of 15 minutes. No loss of film adhesion or visual change when viewed by the unaided eye.
        2) ASTM D 1308 utilizing 20 percent Sulfuric Acid for an exposure time of 18 hours. No loss of film adhesion or visual change when viewed by the unaided eye.
        3) AAMA 2605 utilizing 70 percent reagent grade Nitric Acid vapor for an exposure time of 30 minutes. Maximum color change of 5 Delta E units as calculated in accordance with ASTM D 2244.

2.4 PANEL SYSTEM FABRICATI0N

A. Tolerances:
1. Panel Bow: Maximum 0.8 percent of any 72 inches (1828 mm) panel dimension.
2. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions unless indicated on approved shop drawings.
3. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
4. Maximum deviation from panel flatness shall be 1/8 inch in 60 inches on panel in any direction for assembled units. (Non-accumulative - No Oil Canning).

B. System Characteristics:
1. System shall not have any visible fasteners, telegraphing or fastening on the

panel faces or any other exposed surface that compromises a neat and flat appearance.

2. System shall comply with the applicable provisions of the "Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual" by AAMA and ANSI/AAMA 302.9 requirements for aluminum windows.
3. Fabricate panel system to dimension, size, and profile indicated on the drawings based on a design temperature of 70 degree F (21 degree C).
4. Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight.
5. The finish side of the panel shall have a removable plastic film applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage. Remove masking as soon as possible after installation.

C. System Type:
   1. Rear Ventilated Rain Screen:
      a. System must provide a reveal joint as detailed on drawings.

D. System Performance:
   1. Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Engineer and/or the local building code.
   2. Wind Load:
      a. If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:
      b. Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 lbf/sq. ft. (955 Pa) and 30 lbf/sq. ft. (1436 Pa) on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E 330 to obtain the following results.
         1) Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or 3/4 inch (19 mm), whichever is less.
         2) Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span.
         3) Maximum anchor deflection shall not exceed 1/16 inch (1.6 mm).
         4) At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set

shall not exceed 1/16 inch (1.6 mm).

3. Air/Water System Test:
    a. If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:
    b. Air Infiltration - When tested in accordance with ASTM E 283, air infiltration at 1.57 psf (7.7 kg/sq. m) shall not exceed 0.06 cfm/sq. ft. (0.3 L/s per sq. m) of wall area.
    c. Water Infiltration - Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 lbf/sq. ft. (300 Pa) after 15 minutes of exposure in accordance with ASTM E 331.
4. Pressure Equalized Rain Screen Systems shall comply with AAMA 508 Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.

2.5 ACCESSORIES

A. Extrusions, formed members, sheet, and plate shall conform to ASTM B 209 and the recommendations of the manufacturer.

B. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.

C. Elastomeric polyurethane or silicone sealants within the panel system shall be as recommended by composite panel manufacturer.

D. Fabricate flashing, coping and trim materials from same material and finish as metal panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.

E. Fasteners (concealed, exposed and non-corrosive): Fasteners as recommended by panel manufacturer, designed to withstand required design loads. Do not expose fasteners except where unavoidable and indicated on the approved shop drawings. Any exposed fasteners shall match finish of adjoining metal and include sealing washers.

PART 3 EXECUTION

3.1 EXAMINATION

A. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Structure and substrate to receive system shall be properly prepared to receive work so that maximum deviation from vertical and horizontal alignment of erected panels will not exceed 1/8 inch in 10 feet.

B. Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Contractor and Engineer of unsatisfactory preparation before proceeding. Beginning installation means acceptance of existing conditions.

3.2 INSTALLATION

A. Erect panels in accordance with manufacturer's requirements and approved shop drawings, plumb, level, and true, in proper orientation, sizes, and locations. Tolerances not to exceed 1/8" in 10 feet.

B. Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -55 degree F to +175 degree F. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted. Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation.

C. Panels, flashings, trim, and accessories shall be erected in accordance with an approved set of shop drawings.

D. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.

E. Conform to panel fabricator's instructions for installation of concealed fasteners.

F. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraded, and broken members.

G. Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for rework, if possible, or for replacement with new parts.

H. Separate dissimilar metals and use gasket fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

I. Provide positive and adequate drainage to exterior for moisture entering or condensation occurring within the panel system. Weeps (3/8" diameter) shall be placed every 24 inches maximum and shall have aluminum mesh screen adhered

with silicone adhesive.

J. Pre-treat or prime surface prior to caulking in accordance with sealant manufacturer's recommendations.

3.3 ADJUSTING AND CLEANING

A. Remove and replace panels damaged beyond repair as a direct result of the panel installation.

B. Repair panels with minor damage as acceptable to the Engineer.

C. Remove masking (if used) and strippable films as soon as possible after installation.

D. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.

3.4 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION

SHEET METAL FLASHINGS AND PANELS
Section 07 62 00

1.0 GENERAL

1.1 Related Sections - Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specifications apply to Work of this Section.

1.2 Description of Work - Contractor shall provide and install sheet metal materials meeting the provisions of the Contract and specifications of the Drawings. The extent of work is indicated in the Drawings, and includes metal flashings and metal panels at the north and south elevations.

B. Related work which may be specified elsewhere:

1. Section 07 42 43 – Aluminum-Faced Composite Wall Panels
2. Section 07 62 10 – Adhered Membrane Flashings
3. Section 07 92 13 – Sealants

1.3 Submittals

A. Installation Procedure – Submit written program for each phase of flashing installation including protection of all surrounding materials on building and site during operations. Describe in detail materials, methods and equipment to be used for each phase of sheet metal flashing work.

B. Product Data – Submit manufacturer's technical data. Materials and installation instructions for manufactured items shall be included. Submit tests and compliance certification. Tests and certification shall be performed and presented by an independent testing laboratory, and be less than one year old from the start date.

C. Shop Drawings – Submit Shop Drawings and data showing location and methods of flashing installation.

D. Samples – Provide samples of flashing and colors: 6 inch long (minimum) sample of sheet metal work with any specified coatings, to show maximum ranges of color and flashing material.

1.4 Quality Assurance

A. Contractor shall use skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work.

B. Contractor's Qualifications: Contractors performing this work shall have installed specified materials in the local area for a minimum period of five years.

1.5 Project Conditions

A. Install flashing as instructed by the manufacturer and approved by the Engineer/Owner. Surfaces shall be clean, smooth and free of defects which might affect installation of the flashing.

B. Conduct all work under temperature and climatic conditions as recommended by the manufacturer and standard practice.

2.0 PRODUCTS

2.1 Requirements - Provide labor, equipment, materials and installation as indicated in Contract and approved by Engineer/Owner. Follow all manufacturers' instructions for installation.

2.2 Materials - Provide the following materials as shown on the Drawings or as directed by the Engineer/Owner for each type of flashing to be installed.

A. Pre-finished aluminum flashing material:

1. Petersen Aluminum Corporation Pac-Clad prefinished aluminum, with thickness as designated on the Drawings, or approved equal. Color to match adjacent materials as approved by Engineer/Owner.

B. Pre-finished sheet metal accessories shall be COLORKLAD or approved equal, meeting the following minimum criteria:

1. 22-gauge hot dipped galvanized steel (G-90) commercial quality, extra smooth primed and finished one side with Kynar-based fluoropolymer coating 1.0 ± 0.1 mil total dry film thickness.
2. A wash coat of .3-.4 mil dry film thickness applied to the reverse side.
3. The pre-painted finished side shall be coated with a liquid-applied factory installed strippable film for protection of the finished surface during shipping, fabrication and installation to be removed upon completion of the work. The color shall match adjacent materials and be as approved by Engineer/Owner.

C. Fasteners – Prior to installation, Engineer/Owner's approval of manufacturer shall be obtained for all fasteners, screws, rivets and materials used.

1. Fasteners for attaching galvanized steel and aluminum to masonry or concrete shall be 1/4 inch x 1 inch (minimum) stainless steel screw with mushroom head. Spacing shall be 8 inch maximum.
2. Fasteners for attaching aluminum and galvanized steel sheets to wood shall be #10 flat head stainless steel screws conforming to ASTM A276 Type 304. Length required for attachment to wood shall be 1 inch minimum. Spacing shall be 8 inch maximum for aluminum sheets and 12 inch maximum for aluminum trim. Spacing for galvanized steel shall be as shown on Drawings.
3. Fasteners for attaching aluminum to steel shall be stainless steel, self-drilling/self-tapping SX fastener. Spacing shall be 16 inch o.c. A minimum of 2 screws shall be used per piece.

D. Accessories:

1. Solder – ASTM Specification B32, composition 50 percent tin and 50 percent lead, or as specified herein.
2. Flux – Rosin, muriatic acid neutralized with zinc, or as specified herein.
3. Mastic – Butyl sealant, or as specified herein or in Section 07 92 10.
4. Butyl Tape – 1/8 inch pre-shimmed butyl tape, or as specified herein.
5. Plywood – As specified in Section 06 10 00.
6. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor and approved by the Engineer/Owner.

2.3 Fabrication

A. Form and fabricate the sheet metal in the shop into the shapes and sizes as shown on the Drawings.

B. Fabricate items with the minimum number of joints, using concealed fasteners whenever possible. Lap or lock joints but do not rivet or otherwise restrict relative movement of sections unless shown on the Drawings.

C. Fabricate all window head flashings as single pieces with no laps or splices. At all internal or exterior corners, including all interior aluminum end dams and window sill pans shall have their joints sealed with butyl sealants as shown on Drawings, or as specified herein.

2.4 Delivery, Storage and Handling

A. Materials shall be delivered in the original, unopened manufacturer's containers with all labeling information fully visible.

B. On-site storage of unopened cartons shall be such that the material is kept dry and is not stored at temperatures outside the boundaries indicated in the manufacturer's instructions. Pallets of cartons should not be double stacked for on-site storage.

3.0 EXECUTION

3.1 Examination - Verify that surfaces to receive metal sheet flashing are ready for work. Surfaces to which sheet metal is to be applied shall be smooth, sound, clean, dry and free from defects that might affect the application. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected. Obtain approval from Engineer/Owner prior to start of work. Beginning of work means Contractor has accepted the conditions of the existing surfaces.

3.2 Installation

A. General:

1. Install flashing and components in strict accordance with arrangements shown on the Drawings.
2. Masonry shall be smooth and free of projections.
3. Erect all flashing plumb, level and in-line securely anchored and properly related to other parts of the work.
4. Separate dissimilar metals by bonding membrane tape as specified by the Engineer/Owner, and as specified herein to the matching surfaces of copper and aluminum or copper and steel.

B. Installation Methods:

1. Continuity – Where splices cannot be avoided, flashing pieces shall be lapped at least 6 inches (150 mm) and the laps sealed with mastic or an adhesive compatible with the flashing material, or as directed by the Engineer/Owner.
2. End Dams – Where flashing is not continuous, end dams shall be formed by injecting sealant to prevent passage of water beyond edges of flashing.
3. Extension Through Wall – Flashing shall extend beyond the face of the wall to form a drip. Termination of through-wall flashing behind the exterior face of the wall, unless directed by the Engineer/Owner, is prohibited.
4. Flashing Around Corners – Flashing shall be continuous around corners. Pieces of flashing may need to be cut, in which case the flashing shall be lapped and sealed to conform to the shape of the structure.
5. Flashing at Vertical Supports – When vertical support angles make it necessary to cut, puncture, or otherwise interrupt the flashing, all openings in the flashing shall be tightly sealed and the flashing shall be attached to the vertical supports with mastic.

3.3 Final Cleaning: At the conclusion of the work, remove all equipment used, clean up debris, refuse and surplus material and remove from work site.

END OF SECTION 07 62 00

ADHERED MEMBRANE FLASHING
Section 07 62 10

1.0 GENERAL

1.1 Related Sections

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specifications apply to work of this Section.

1.2 Description of Work

Contractor shall provide adhesive membrane materials meeting the provisions of the Contract, the Specifications and the Drawings. The extent of work is indicated in the Drawings, unless specified herein.

A. Related work which may be specified elsewhere:
   1. 07 42 43 – Aluminum-Faced Composite Wall Panels
   2. 07 62 00 – Metal Flashing
   3. 07 92 13 – Sealants and Caulking

1.3 Submittals

A. Installation Procedure – Submit written program for each phase of flashing installation including protection of all surrounding materials on building and site during operations. Describe in detail materials, methods and equipment to be used for each phase of flashing work.

B. Product Data – Submit manufacturer's technical data. Materials and installation instructions for manufactured items shall be included. Submit tests and compliance certification. Tests and certification shall have been performed and presented by an independent testing laboratory and be less than one year old from the start date.

C. Shop Drawings – Submit Shop Drawings and data showing areas of flashing to be installed and methods of installation.

D. Samples – Provide samples of flashing material 12 square inches (minimum).

1.4 Quality Assurance

A. Contractor shall use skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work.

B. Contractor's Qualifications: Contractors performing this work shall have installed specified materials on past projects of a similar size and construction for a minimum period of five years.

1.5 Project Conditions

A. Install flashing as instructed by the manufacturer and approved by the Engineer. Surfaces shall be clean, smooth and free of defects which might affect installation of the flashing.

B. Conduct all work under temperature and climatic conditions as recommended by the manufacturer and standard practice.

2.0 PRODUCTS

2.1 Materials

Provide labor, equipment, materials and installation as indicated in Contract and approved by Engineer. Follow all manufacturers' instructions for installation. Provide the following materials as shown on the Drawings or as directed by the Engineer for each type of flashing to be installed.

A. Self-adhesive, butyl-based membrane wall flashing. Minimum thickness of flashing material shall be 40 mils. Membrane shall be backed with polyurethane sheeting or other pliable synthetic film. Subject to conformance requirements, furnish products by one of the following manufacturers:

1. Flashing Membrane:
    a. Carlisle 705 THRU-WALL FLASHING
    b. DuPont THRU-WALL FLASHING
    c. Approved equal

B. Fasteners – Prior to installation, Engineer's approval of manufacturer shall be obtained for all fasteners, screws, rivets and materials used.

1. Fasteners for attaching metal membrane termination bar to back up masonry shall be minimum 3/16 inch x 1 inch (minimum) Tapcon, Congrip.
2. Nylon drive in anchor pins with rust resistant nails.
3. Fastener spacing shall be 12 inch maximum for termination bar.

C. Accessories

1. Primer: Per manufacturer's recommendations
2. Mastic: Per manufacturer's recommendations

3. Termination bar: Aluminum

2.2 Delivery, Storage and Handling

A. Flashing materials shall be delivered in the original, unopened manufacturer's containers with all labeling information fully visible.

B. On-site storage of unopened cartons shall be such that the material is kept dry and is not stored at temperatures in excess of 100°F. Pallets of cartons shall not be double stacked for on-site storage.

3.0 EXECUTION

3.1 Examination

Verify that surfaces to receive flashing are ready for work. Surfaces to which adhered membrane masonry flashing is to be applied shall be smooth, sound, clean, dry and free from defects that might affect the application. Correct conditions detrimental to timely and proper completion of the work. Obtain approval from Engineer prior to start of work. Beginning of work means Contractor has accepted the conditions of the existing surfaces.

3.2 Installation

A. General

1. Install flashing and components in strict accordance with arrangements shown on the Drawings.
2. Substrate shall be smooth and free of projections and debris.
3. Install all flashing according to manufacturer's instructions; plumb, level and in-line securely anchored and properly related to other parts of the work.

B. Installation Methods

1. Continuity – Flashing pieces shall be lapped at least 4 inches and the laps sealed with mastic or an adhesive compatible with the flashing material, or as directed by the Engineer.
2. Roll entire surface with a hand-held roller; roll laps double.
3. End Dams – Where flashing is not continuous, the ends of the flashing shall be extended beyond the jamb lines on both sides and shall be turned up into the head joint several inches at each end to form a dam. Flashing shall be folded, and not cut. Extend flashing dam to the exterior face of façade.
4. Flashing Around Corners – Flashing shall be continuous around corners. Pieces of flashing may need to be cut, in which case the flashing shall be lapped and sealed to conform to the shape of the structure.

5. Flashing at Vertical Supports – When vertical support angles make it necessary to cut, puncture, or otherwise interrupt the flashing, all openings in the flashing shall be tightly sealed and the flashing shall be attached to the vertical supports with mastic.
6. Install reglets and fasteners for flashing and other related work where shown to be built into masonry work.
7. Flashing seams must be thoroughly bonded in a manner which prevents water penetration.

C. Window Head or Steel Lintel Reflashing

Install window head flashing where shown on the drawings or where directed by Engineer.

1. Prepare surface to receive wall flashing membrane.
2. Where an exposed drip is to be installed fabricate a performed, 24 gauge pre-finished metal pan to be placed along the top of the steel lintel. Where sections of the sheet metal pan flashing overlap seal top of joint with wall flashing placed on top of the sheet metal fully adhered.
3. Apply primer by brush or roller at rate specified by manufacturer.
4. Apply wall flashing membrane to primed surfaces. Overlap adjacent pieces 4 inches or as instructed by the manufacturer.
5. Roll entire surface with hand-held roller. Roll laps double.
6. Trim leading edge of membrane on horizontal leg of steel angle or prefinished sheet metal flashing within 1/2" back from leading edge of brick.
7. Install fasteners and/or sealants as specified.
8. Adhere top edge of membrane to masonry of inner wythe in wall cavity with non corroding metal termination bar. Termination bar to be held firmly to masonry by mechanical fasteners in such a way as to secure membrane from debonding from masonry in wall cavity.
9. Build and install end dams at ends of flashing termination.
10. Complete masonry installation including weep system and sealants as required.

3.3 Final Cleaning

A. At the conclusion of the work, remove all equipment used, clean up debris, refuse and surplus material and remove from work site.

END OF SECTION 07 62 10

SEALANTS AND CAULKING
Section 07 92 13

1.0 GENERAL

1.1 Related documents

A. The Drawings, the provisions of the Contract including the General and Supplementary Conditions, and the General Requirements apply to the Work of this Section.

B. ASTM C 1193 – Standard Guide for Use of Joint Sealants

1.2 Description of Work

Remove existing caulking in all areas as shown on the Drawings. Install fresh sealant to clean, dry surfaces. Applications of exterior caulking where shown on drawings may include the following:

A. Perimeters of window and metal panel systems.

B. Perimeters of glass and metal panels within window systems.

D. Other locations noted on the Drawings.

1.3 Submittals

A. Color Samples - Submit actual samples of color range of material for Engineer's approval, or sample of custom color matches for Engineer's acceptance.

B. Manufacturer's Recommendations: Submit technical data including performance requirements, surface preparation and installation instructions, and recommendations to Engineer for approval of materials used.

C. Substitution Recommendations: Submit manufacturer's literature, caulking samples, primer, backer rod, and all other applicable literature and samples for approval by Engineer.

1.4 Quality Assurance

A. Single Source Responsibility for Joint Sealer Materials - Obtain joint sealer materials from a single manufacturer for each different product required. Alternate materials must meet Engineer's approval.

B. Certificates - Submit certificates from manufacturers of joint sealers attesting that their products comply with specification requirements and are suitable for the use indicated and meet Engineer's approval.

C. Follow all manufacturer's instructions and applicable codes, regulations and standards for over-spray and final clean-up of products used in joint sealing and caulking.

D. Installation shall be by Contractor with no less than 5 years successful experience in application of sealants and caulking of type required similar to those of this project, and which is acceptable to manufacturer of sealant and caulking.

E. Adhesion-in-Peel Testing

1. Prior to installation of sealant, the contractor shall install sealant on a sample area on the building for the purpose of an adhesion-in-peel test.

2. The sample areas shall be constructed in accordance with the project documents. The location of the sample area will be selected by the engineer.

3. Adhesion-in-peel tests will be performed per ASTM C1193, method A, to test adhesion on the following surfaces: limestone, brick, metal window/door frame, and metal ribs. Three tests will be performed on each substrate.

4. Following successful testing of sealant at each test location, contractor shall restore the sealant joint in the sample area. A successful test shall be considered if the sealant fails cohesively within itself or elongate to manufacturers determined extension value.

5. Additional adhesion-in-peel testing will be performed by the engineer. Testing rate will vary depending on joint location, type, and configuration.

1.5 Project Conditions

A. Adequate ventilation must be provided to prevent accumulation of hazardous fumes during application of solvent-based components in enclosed spaces, and maintain ventilation until coatings have thoroughly cured. Applicable codes, standards and regulations ensuring safety and protection of persons, motor vehicles, surrounding surfaces of building, and building site shall be enforced.

B. Environmental Conditions - Do not proceed with installation of caulking under the following conditions:

1. When ambient and substrate temperature conditions are outside the limits permitted by joint caulking manufacturers.

2. When joint substrates are wet due to rain, frost, condensation or other causes.

C. Joint Width Conditions - Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.

1.6 Mock-up Panel

A. Contractor shall mockup the sealant joint installation at a typical location of failed sealant: (1) horizontal brick expansion joint, (1) vertical brick expansion joint, (1) window perimeter. Mockup shall demonstrate all sealant joint profiles and colors to be used. Contractor shall not proceed with work until mockup panel is approved by owner.

1.7 Warranty

A. Provide manufacturer's 5 year standard material warranty.

B. Include coverage for replacement of sealant materials which fail to achieve water tight seal, exhibit loss of adhesion or cohesion, or do not cure, provided sealant has been installed per manufacturer's recommendations.

C. Warranty Exclusions: Failure resulting from excess movement, concrete shrinkage, structural cracks or defects, faulty construction, faulty design, faulty materials (other than joint sealants), improper installation, misuse of structure, settlement, or accident, fire, or other casualty or physical damage.

2.0 PRODUCTS

2.1 Requirements

Provide products which are recommended by the manufacturer to be fully compatible with indicated substrates. All products, requested or suggested as alternate by Contractor must be approved by the Engineer and be in compliance with the Drawings and general provisions of the Contract. Reference schedule at end of section for general product applicability.

2.2 Materials

Materials shall be used as specified in the Drawings and provisions of the Contract. Alternative materials suggested for caulking shall be subject to approval of the Engineer. Alternative product information and certification must be submitted to the Engineer for acceptance before continuance of work. Materials may include the following:

A. Silicone & Polyurethane Sealant

1. Silicone: Dow Corning 795 Silicone Sealant, or approved equal.

2. Polyurethane: Masterseal NP1, Masterseal NP100, or approved equal.

B. Backer Rod: Closed-cell polyethylene.

1. Sonneborn Sof foam

2. Nomaco

3. Approved equivalent.

C. Primers: As recommended by sealant and caulking compound manufacturer.

D. Bond Breaker: As recommended by the sealant manufacturer to prevent adhesion at the root sealant joint. A bead of silicone sealant may be installed to provide bond break at the root of fillet welds; silicone sealant must be fully cured prior to installation of polyurethane sealant.

E. Cleaner: As recommended by compound manufacturer for the materials to be cleaned.

2.3 Delivery, Storage and Handling of Materials and Equipment

A. Deliver materials to project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.

B. Promptly inspect shipments to ensure that products comply with requirements and are undamaged. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures and in accordance with manufacturer's directions and warranty guidelines.

3.0 EXECUTION

3.1 Examination

Require installer to inspect joints indicated to receive caulking for compliance with requirements for joint configurations, installation tolerances and other conditions affecting caulking performance. Obtain installer's written report listing any conditions

detrimental to performance of caulking work. Do not allow Contractor to proceed until unsatisfactory conditions have been corrected.

3.2 Sequencing/Scheduling

A. Surface Cleaning of Joints - Clean out joints immediately before installing caulking to comply with recommendations and warranty of caulking manufacturers and the following requirements:

1. Remove existing sealant from joints using utility razor knives or other suitable hand tools. Remove all foreign material from joint substrates which could interfere with adhesion of caulking, including dust, paints (except for permanent protective coatings tested and approved for caulking adhesion and compatibility by manufacturer), oil, grease, waterproofing, water repellents, water, surface dirt, frost, and any other materials noted by Engineer or Contractor.

2. Clean concrete, masonry and similar porous joint substrate surfaces methods indicated by the Contract, Drawings, and as suggested by Contractor and approved by Engineer to produce a clean, sound substrate capable of developing optimum bond with caulking. Remove loose particles remaining from cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance and form release agents from concrete.

4. Clean metal, glass and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of caulking.

B. Joint Priming – Joint primer shall be used unless sealant manufacturer indicates in writing that priming will be detrimental to sealant adhesion or performance. Apply primer to comply with caulking manufacturer's recommendations. Confine primers to areas of joint sealer bond; do not allow spillage or migration onto adjoining surfaces.

C. Use masking tape where required to prevent contact of caulking with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove caulking smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 Preparation

A. Clean, prepare, and size joints in accordance with manufacturer's and Engineer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant.

B. Verify that joint shaping materials and release tapes are compatible with caulking materials.

C. Examine joint dimensions and size materials to achieve required width/depth ratios.

D. Use joint filler to achieve required joint depths, to allow caulking to perform properly.

E. Use bond breaker where required.

F. Prime substrate as required by manufacturer.

G. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless caulking manufacturer's printed instructions indicate that alkalinity does not interfere with bond and performance. Protect any adjacent materials from etching action.

3.4 Caulking Operations

A. Prior to performance of caulking, a sample of caulking color and application must be provided for the Owner. Work shall proceed only after Owner's approval of test application.

B. Comply with sealant manufacturer's printed instructions except where more stringent requirements are specified herein.

C. Install backings are to comply with, but are not limited to, the following requirements:

1. Install joint fillers of type indicated to provide support of caulking during application and at position required to produce the cross-sectional shapes and depths of installed caulking relative to joint widths which allow optimum caulking movement capability.

2. Do not leave gaps between ends of joint-fillers.

3. Do not stretch, twist, puncture or tear joint fillers.

4. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.
5. Install bond breaker between sealants and joint fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.

D. Install caulking by proven techniques that result in caulking directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

E. Tooling of Nonsag Caulking - Immediately after caulking application and prior to time skinning or curing begins, tool caulking to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess material from surfaces adjacent to joint. Do not use tooling agents which discolor caulking or adjacent surfaces or are not approved by manufacturer. Concave joint configuration as required by Drawings and provisions of the Contract.

F. Employ only proven installation techniques which shall ensure that caulking shall be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint-bond surfaces equally on opposite sides.

G. Fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surfaces and a vertical surface, fill joint to form a slight cove, so that joint shall not trap moisture and dirt.

H. For joints subject to traffic and abrasion, fill joints to a depth equal to 75% of joint width, but not more than 3/4" deep or less than 3/8" deep.

I. For normal joints sealed with sealants and not subject to traffic, fill joints to a depth equal to 50% of joint width, but not more than 1/2" deep or less than 1/4" deep.

J. Where necessary, use masking tape to avoid overflow onto adjoining surfaces or migration into the voids of rough textured surfaces.

K. Remove excess and spillage of compounds promptly as the work progresses. Clean the adjoining surfaces to eliminate evidence of spillage.

L. Cure caulking compounds in compliance with manufacturer's recommendations and warranty to obtain high early bond strength, internal cohesive strength and surface durability.

3.5 Protection and Final Cleaning

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce installations with repaired areas indistinguishable from original work.

B. Clean off excess caulking or smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturer and Engineer.

3.6 Sealant Product Schedule:

A. The following schedule is to be used as a guideline for appropriate sealant product selection. Actual substrate conditions and previous sealant applications may modify this schedule – contractor to verify appropriate substrate for each product type.

1. Concrete: Polyurethane
2. Concrete Masonry: Polyurethane
3. Brick/Clay Masonry: Polyurethane
4. Metal: Polyurethane
5. Metal to Concrete/Masonry: Polyurethane
6. Metal to Glass: Silicone

END OF SECTION 07 92 13