WESTERN ARCHITECTURAL
forensic architects & engineers

• PROJECT MANUAL

FOR

PORTLAND CENTER FOR THE PERFORMING ARTS

Exterior Repair Project at Antoinette Hatfield Hall

Portland, OR

OWNER:

Metro | Exposition Recreation Commission
600 NE Grand Ave.
Portland, OR 97232-2736

CONSULTANT:

WESTERN ARCHITECTURAL
10200 SW Greenburg Rd., Suite 750
Portland, OR 97223
503.297.0665

W.A. JOB NUMBER:

OR13-070

DATE OF ISSUE:

April 26, 2013

PROJECT MANUAL

Portland Center for the Performing Arts Exterior Repair Project

DESIGN TEAM

OWNER

Metro | Exposition Recreation Commission
600 NE Grand Ave.
Portland, OR 97232-2736

CONSULTANT

Note: Within this Project Manual, the term *Consultant* shall mean Western Architectural.

WESTERN ARCHITECTURAL
10200 SW Greenburg Rd., Suite 750
Portland, OR 97223
Phone: 503.297.0665 | Fax: 503.297.0757

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PART 1 – GENERAL

1.1 SUMMARY OF WORK

A. **Project:** Portland Center for the Performing Arts (PCPA); Antoinette Hatfield Hall, 1111 SW Broadway, Portland OR 97205.

B. **Owner**: Metro | Exposition Recreation Commission, 600 NE Grand Ave., Portland OR 97232.

C. **Consultant:** Western Architectural, 10200 SW Greenburg Road, Suite 750, Portland OR 97223.

D. The Work consists of:

1. General Construction and Staging:

   a. General Contractor is expected to visit the site of proposed construction prior to submittal of bid. Verify and inspect the existing site to inform themselves of all observable conditions and to determine dimensions, conditions and general scope of work. Failure to do so does not relieve the successful bidder from responsibility of completion of the project in accord with the Contract Documents. Starting work constitutes acceptance of existing conditions.

   b. General Contractor shall provide competent supervision of the work. A superintendent shall represent the General Contractor continuously throughout the project and all communication with superintendent shall be binding upon the Contractor.

   c. All construction shall be in compliance with the 2010 Oregon Structural Specialty Code and local government codes and ordinances.

   d. Provide scaffolding and weather protection as necessary.

   e. Provide protective measures for concrete flatwork, building and adjacent building surfaces and materials from damage.

   f. Provide dumpster and toilet facilities for the duration of the construction.

   g. Owner to provide permits under the Facility Permit Program as well as perform special inspections.

   h. Provide general construction insurance.

2. Cladding System: The current cladding system is an Exterior Insulation and Finish System (EIFS), over paper-faced gypsum sheathing, over metal framing, over cast-in-place (CIP) concrete. Existing parapet walls have metal lath included.

   a. Remove and dispose/recycle 100% of the existing EIFS at areas indicated on the plans and elevations. Areas consist of the south- and west-facing walls within the alleyway adjacent to Brunish Hall, and the four walls enclosing the mechanical equipment on both the east and west sides of the deck.

   b. Remove and dispose/recycle 100% of the metal cap flashing covering the existing EIFS walls within the limits of construction.

   c. Remove and dispose/recycle 100% of the bottom termination flashing within the limits of construction.

   d. Remove and dispose/recycle 100% of the paper-faced gypsum sheathing at the areas outlined above. Contractor is responsible for proper disposal of the mold-contaminated materials and protection of workers from exposure to mold-contaminated materials.

   e. Apply Corroseal rust-converting primer, or owner-approved equal, to all areas of exposed metal framing that show signs of corrosion. Corroseal is to be installed

per manufacturer's current specifications and instructions and with proper cleaning of substrates prior to installation.

f. Extend the top of the wall framing upward to allow for continuous metal cap to slope toward roofing system with a minimum slope of 1/4":12" at all locations within the scope of work.

g. Install Densglass Exterior Sheathing over existing metal framing. Fasteners to be corrosion-resistant, spaced at a maximum of 8" o.c. and installed per manufacturer's current specifications and installation instructions. Do not overdrive fasteners.

h. Replace all damaged insulation. Provide a 15% insulation replacement allowance.

i. Replace all structurally damaged metal framing. Provide a 15% replacement allowance for damaged metal framing.

j. Flash all door/louver assemblies and penetrations in place with Sto tape and Sto Rapid Seal to ensure a continuous barrier.

k. Install Sto Corporation StoTherm Lotusan NExT EIFS system, or owner-approved equal, per manufacturer specifications. Sto assembly to include Sto Gold Fill with Sto Detail mesh for details, vertical legs of flashing and seams in sheathing; Sto BTS Plus Adhesive; Sto Gold Coat; Sto Insulation Board; Sto BTS Plus Basecoat and Sto Mesh; and Stolit Lotusan Finish with recommended starter track with weep holes.

l. On the south- and west-facing walls within the alleyway adjacent to Brunish Hall and west wall within the mechanical pit, contractor must install the EIFS system without removing existing metal cap flashing, which was installed new in 2012.

j. Install 2 layers of Sto Ultra-High Impact Mesh at high-traffic areas within alleyway per details and manufacturer specifications from the base of the wall up a minimum of 8' (eight feet) vertically.

k. Install a concrete curb at the base of the wall on the north side of the alleyway big enough to prevent dumpsters from damaging new EIFS system. Contractor to verify dumpster dimensions on site to determine appropriate width for new concrete curb. Ensure EIFS is properly terminated above concrete curb with flashing details per manufacturer's installation instructions and details.

3. Flashing:

a. Install minimum 24 gauge, pre-coated, hemmed L-flashing at base of wall at covered concrete entry slabs.

b. Install pre-coated minimum 24-gauge sheet metal cap flashing, in a standing seam orientation, at all areas within scope and tie into existing metal flashing at those junctures. Ensure high temp self-adhering membrane flashing (SAMF) is properly installed at parapet termination.

c. Install custom, pre-coated minimum 24-gauge sheet metal saddle flashing at all applicable through-wall penetrations and parapet cap terminations in EIFS walls, and properly lap with air barrier. Weld saddle flashing to existing structural steel for weather seal where required.

d. Install pre-coated minimum 26-gauge sheet metal flashing with hemmed edge at all EIFS bottom wall terminations and door/louver heads, and weather lap with air barrier. Leave open for drainage where required by manufacturer and outlined in the contract document details.

e. Install pre-coated minimum 26-gauge sheet metal counter-flashing at roofing areas adjacent to EIFS within limits of construction. Counter-flashing to marry with hemmed edge of bottom termination flashing and to be removable for future roofing maintenance.

4. Sealant:
   a. Install properly-dimensioned 3/4" sealant joints with closed-cell backer rod (per SWRI) at all windows, doors, terminations and miscellaneous penetration perimeter conditions.
   b. Prime all joints with sealant manufacturer's primer.
   c. Ensure sealant is installed to EIFS base coat only. Do not apply sealant to EIFS finish coat.
   d. Install Horizontal Colorseal (by Emseal) at transition to adjacent church stone cap at roof level. See plans for details.
   e. Ensure sealant and backer rod have been evaluated in accordance with ASTM C 1382, “Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems (EIFS) Joints”, and that it meets minimum 50% elongation after conditioning.
   f. Ensure air barrier continuity is maintained across sealant joints and drains to the exterior.
5. Reveals:
   a. Install reveals to match existing design. All horizontal reveals must have a minimum 1:2 (27-degree) slope along their bottom surface. Where the bottom surface of the reveal projects/recesses more than 2" from the face of the EIFS wall plane, protection of the top surface with a waterproof base coat is mandatory.
6. Gutters and Downspouts:
   a. Remove, retain and reinstall all gutters and downspouts as necessary to conduct work.
   b. Contractor is responsible for all damage to gutters and downspouts as a result from rehabilitation activities.
7. Exterior Fixtures:
   a. All exterior fixtures to be reinstalled or replaced if damaged.
   b. Remove and reinstall all exterior fixtures as required to complete work.
   c. Exterior sprinkler system removal is most likely required at adjacent church property in order to install EIFS per manufacturer's specifications. Contractor is to verify prior to submitting bid. Obtain Fire Marshall approval if sprinkler system will need to be deactivated or removed for any period of time.
8. Doors/Louvers:
   a. Remove and replace all metal doors. New doors are to match existing.
   b. Remove all louvers.
   c. Prime with rust inhibitive primer. Sand and smooth all rough edges.
   d. Provide 2 (two) coats of high quality acrylic paint and reinstall properly integrated with new EIFS system and flashing.
   e. Custom fabrication of the metal door on the east elevation within the alleyway may be required, as this door is not standard height.

E. Work Under Other Contracts:

1. None.

1.2 WORK RESTRICTIONS

A. Contractor's Use of Premises: During construction, Contractor will have limited use of site and building as indicated herein. Contractor's use of premises is limited as follows:

1. Owners will occupy premises during construction. Perform construction only during normal working hours (7 AM to 5 PM Monday thru Friday, other than holidays), unless otherwise agreed to in advance and with the signed authorization of the Owner. Clean up work areas and return to a useable condition at the end of each work period.

2. Owner will provide up to 3 parking passes adjacent to the site, on Park St. Contractor must coordinate with owner to procure parking passes.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION

PART 1 – GENERAL

1.1 ALLOWANCES

A. 15% insulation allowance

B. 15% metal framing allowance

1.2 UNIT PRICES

A. A unit price is an amount proposed by bidders and stated on the Bid Form as a price per unit of measurement for work added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased. Bidders shall indicate on the Bid Form unit prices for the following items of work:

Unit Prices:

- Replacement of metal framing per linear foot
- Replacement of insulation per square foot

1.3 CONTRACT MODIFICATION PROCEDURES

A. On Owner's approval of a proposal from Contractor on AIA Document G709, the Architect will issue a Change Order on AIA Document G701, for all changes to the Contract Sum or the Contract Time.

B. When Owner and Contractor disagree on the terms of a proposal, Architect may issue a Construction Change Directive on AIA Document G714, instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order. Construction Change Directive will contain a description of the change and designate the method to be followed to determine changes to the Contract Sum or the Contract Time.

1.4 PAYMENT PROCEDURES

A. Submit a Schedule of Values at least 10 days before the initial Application for Payment. Break down the Contract Sum into at least one line item for each Specification Section in the Project Manual table of contents. Coordinate the Schedule of Values with Contractor's Construction Schedule.

1. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
2. Provide separate line items in the Schedule of Values for initial cost of materials and for total installed value of that part of the Work.

B. Submit 3 copies of each application for payment on AIA Document G702/703, according to the schedule established in Owner/Contractor Agreement.

1. With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
2. Submit final Application for Payment after completion of Project closeout procedures with release of liens and supporting documentation.
   a. Include consent of surety to final payment on AIA Document G707 and insurance certificates.
   b. Submit final meter readings for utilities, a record of stored fuel, and similar data as of the date of Substantial Completion.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes procedures for the following:

1. Contractor's responsibilities concerning substitutions.
2. Substitutions requests during the bidding period.
3. Substitutions requests after award of Contract.
4. Substitutions not permitted.

B. Related Sections:

1. Section 016000: Product Requirements, for requirements governing Contractor's selection of products and product options.

1.2 DEFINITIONS

A. Substitutions: Contractor proposals for changes in products, materials, equipment, and methods of construction required by the Contract Documents made during bidding and after award of Contract are considered to be requests for substitution.

1. The following are not considered to be requests for substitution:
   a. Revisions to the Contract Documents requested by Owner or Architect.
   b. Specified options of products and construction methods included in the Contract Documents.
   c. Contractor's determination of and compliance with regulations and orders issued by governing authorities.

B. Substitutions accepted during the bidding period are accepted by Addendum prior to award of Contract, and thereafter are included in the Contract Documents.

C. Substitutions requested and accepted after award of contract are accepted only by Change Order, and thereafter are included in the Contract Documents.

1.3 CONTRACTOR'S RESPONSIBILITIES

A. Contractor's responsibilities for substitution requests made after award of Contract are as follows:

1. Investigate proposed products and determine they are equal or superior in all respects to products specified.
2. Provide same guarantee for accepted substitutions as for products specified.
3. Make changes in, and coordinate, the Work as may be required to incorporate and install accepted substitutions.
4. Waive all claims for additional costs that subsequently become apparent which are related to substitutions.

1.4 SUBSTITUTION SUBMITTAL PROCEDURES

A. Acceptability of different materials or products shall be determined by methods set forth in this Section.

B. Architect will be sole judge of acceptability of any proposed substitution, and decision of Architect will be final.

PART 2 – PRODUCTS

2.1 SUBSTITUTION REQUIREMENTS DURING THE BIDDING PERIOD

A. Submit request for approval of a substitution on Western Architectural Substitution Request Form; Copy included at the end of this Section.

B. All substitution requests must be received in the Architect's office no less than **10 working days prior to Bid Date**, unless otherwise stipulated in the Instructions to Bidders.

2.2 SUBSTITUTIONS REQUESTED AFTER AWARD OF CONTRACT

A. Substitutions will normally not be considered after award of Contract, except due to unforeseen circumstances.

B. Architect will receive and consider Contractor's request for substitution after award of Contract when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not met, Architect will return the requests without action except to record noncompliance with these requirements.

1. The specified product cannot be provided within the Contract time.
   a. Architect will not consider the request if the product cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
2. The specified product cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
3. The specified product cannot be coordinated with other materials and the Contractor certifies that the proposed substitution can be coordinated.
4. The specified product cannot provide the required warranty and the Contractor certifies that the proposed substitution provides the warranty.
5. The requested substitution offers the Owner a substantial advantage in cost, time, or other considerations after deducting additional Owner's cost of compensation to the Architect for redesign and evaluation services, increased cost of other construction, and similar considerations.

C. Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

2.3 SUBSTITUTIONS NOT PERMITTED

A. Substitutions indicated or implied on submitted Shop Drawings or Product Data without first requesting approval in accordance with requirements of this Section.

B. Where manufacturers, products, or systems listed in the Specifications are not followed with "or approved" or "Substitutions: Provide in accordance with requirements of Section 012500," it is intended that substitutions are not permitted.

PART 3 – EXECUTION (Not Applicable)

END OF SECTION

SECTION 012501

Substitution Request Form

PROJECT:

SPECIFIED ITEM:

Section:_____ Page:_____ Paragraph:_____

Description:

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION:

1. Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.
2. Attached data also includes description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

3. The proposed substitution does not affect dimensions shown on Drawings.
4. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
5. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
6. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the Proposed Substitution are equivalent or superior to the Specified Item.

Undersigned agrees, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.

Submitted By:_____
Signature:_____ Date:_____
Firm:_____
Address:_____
Telephone:_____ Email:_____
Attachments:_____

Below for use by Design Consultant:

_____Accepted: By:
_____Not Accepted: Date:
_____Accepted as Noted: Remarks:
_____Received too Late:

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General Project coordination procedures.
2. Project meetings.
3. Construction schedule.
4. Submittal schedule.

B. Related Sections:

1. Section 016000: Product Requirements, for coordinating selection of products.
2. Section 017400: Cleaning and Waste Management, for coordinating progress and final cleaning.
3. Section 017700: Closeout Procedures, for coordinating Contract closeout requirements.

1.2 COORDINATION

A. Coordinate construction operations included in various Specification Sections to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Coordinate storage or staging areas for all trades.

B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate Contractors if coordination of their Work is required.

C. Administrative Procedures:

1. Coordinate scheduling and timing of required administrative procedures with other construction activities, activities of the Owner, and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

a. Preparation of Contractor’s construction Schedule.
b. Preparation of the Schedule of Values.
c. Installation and removal of temporary facilities and controls.
d. Delivery and processing of submittals.
e. Progress meetings.
f. Preinstallation conferences.
g. Startup and adjustment of systems.
h. Project closeout activities.

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

E. Coordination of Key Personnel: Within 15 days of commencement of construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site.

1. Identify individuals, their duties and responsibilities.
2. List addresses and telephone numbers, including home and office telephone numbers.
3. Post copies of list in Project meeting room, and temporary field office. Keep list current at all times.

1.3 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute agenda to all invited attendees.
3. Minutes: Record significant discussions, and agreements achieved. Distribute meeting minutes to everyone concerned, including Owner and Architect, within 72 hours after each meeting.

B. Preconstruction Conference:

1. Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but not later than 15 days after execution of Agreement.
    a. Hold conference at Project site or other location agreeable to Owner and Architect.
    b. Conduct meeting to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties deemed necessary.
3. All participants shall be familiar with Project and authorized to conclude matters relating to the Work.
4. Agenda: Discuss items of significance that could affect progress, including the following:
    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Routing of correspondence.
    f. Distribution of Contract Documents.
    g. Procedures for processing field decisions and Change Orders.
    h. Procedures for Requests for Interpretation (RFIs).
    i. Submittal procedures and mockups.
    j. Procedures for testing and inspection.
    k. Procedures for processing Applications for Payment.
    l. Procedures for substitutions.
    m. Responsibility for temporary facilities and controls.
    n. Use of premises and Owner’s Utilities.
    o. Work restrictions.
    p. Site access, traffic, and parking availability and rules.
    q. Office, work, and storage areas.
    r. Security.
    s. Progress cleaning.

t. Construction waste management and recycling.
u. Owner's occupancy requirements.
v. Closeout Procedures.

5. Minutes: Contractor will record and distribute meeting minutes.

C. Preinstallation Conferences:

1. Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
2. Attendees: Contractor and its superintendent, installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow. Include code enforcement personnel if required by local codes.
3. Advise Architect of scheduled meeting dates.
4. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. The Contract Documents.
b. Related Change Orders.
c. Related RFIs.
d. Submittals.
e. Review of mockups.
f. Possible conflicts or compatibility problems.
g. Time schedules.
h. Weather limitations.
i. Manufacturer's written recommendations.
j. Warranty requirements.
k. Acceptability of substrates.
l. Temporary Facilities and Controls.
m. Regulations of authorities having jurisdiction.
n. Testing and inspecting requirements.
o. Installation procedures.
p. Coordination with other work.
q. Protection of adjacent work.

5. Record significant conference discussions, agreements, disagreements, and required corrective measures and actions.
6. Do not proceed with installation if conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene conference at earliest feasible date.
7. Minutes: Contractor will record and distribute meeting minutes to each party present and to parties who should have been present.

D. Progress Meetings:

1. Conduct progress meetings at Project site at regular scheduled intervals.

a. Coordinate meeting dates with preparation of payment request.

2. Attendees: Authorized representatives of Owner, Architect, Contractor, and each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of immediate future activities.

a. Participants shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that affect progress, including topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind

schedule in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

b. Review schedule for next period.

c. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Progress cleaning.
5) Quality and Work standards.
6) Status of correction of deficient items.
7) Field observations.
8) RFI status.
9) Status of Proposal Requests.
10) Status of Change Orders.
11) Project administration issues.

4. Minutes: Contractor will record and distribute meeting minutes only to Owner and Architect. Contractor shall be responsible for distribution to subcontractors, suppliers, or other entities concerned with current progress.

5. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit a comprehensive, fully developed, horizontal bar-chart type Contractor's Construction Schedule within 30 days after date established for commencement of Work.

B. Indicate each significant construction activity separately. Identify first working day of each week with a continuous vertical line.

1. Include start-up, finish, duration, slack time, approval dates, material ordering, delivery dates, anticipated shutdowns, partial occupancy and Owner use, Completion Date and other such information required to allow Owner's monitoring of progress of project and identifying critical path of events required to meet Completion Date.

2. Use same breakdown of units of Work as indicated in Schedule of Values.

C. Distribution: Following response to initial submittal, print and distribute copies to Architect, Owner, subcontractors, and other parties required to comply with scheduled dates.

D. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized.

1. Bring significant deviations from Schedule immediately to Owner's and Architect's attention.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Related Sections include the following:

1. Division 1 Section “Price and Payment Procedures” for submitting Applications for Payment.
2. Division 1 Section “Construction Progress Documentation” for submitting schedules and reports, including Contractor’s Construction Schedule and the Submittals Schedule.
3. Division 1 Section “Quality Requirements” for submitting test and inspection reports and Delegated-Design Submittals and for erecting mockups.
4. Division 1 Section “Closeout Procedures” for submitting warranties Project Record Documents.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect’s responsive action.

B. Informational Submittals: Written information that does not require Architect’s approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. Important Note: The submittal process is not a means to change the requirements of the Contract Documents. Approval of a submittal does not constitute a change order, change directive or acceptance of a substitution. Every submittal is assumed to and required to comply fully with the Contract Documents (including prior modifications). Installed work found later not to be in compliance with Contract Documents must be removed and replaced with work that is in compliance. If deviations are required due to field conditions, product availability, coordination limitations, etc., obtain Architect’s approval through Contract Modification procedures prior to preparing and submitting submittal.

B. Prior to transmission of a submittal to the Architect, review the submittal for completeness, accuracy, compliance with the Contract Documents, and coordination with other construction. Note corrections and field dimensions. Clearly note any items that require clarification by the Architect. Mark with Contractor’s approval stamp before submitting to Architect.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
3. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received. Architect’s withholding of

action for purposes of coordination with other submittals will not constitute a delay to the project.

D. Submittals Schedule: Comply with requirements in Division 1 Section “Construction Progress Documentation” for list of submittals and time requirements for scheduled performance of related construction activities.

E. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect’s receipt of submittal.

1. Initial Review: Allow 15 calendar days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Allow 15 calendar days for processing each resubmittal.

3. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

F. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.

2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor’s review and approval markings and action taken by Architect.

3. Include the following information on label for processing and recording action taken:

a. Project name.
b. Date.
c. Unique identifier, including revision number.
d. Number and title of appropriate Specification Section.
e. Drawing number and detail references, as appropriate.
f. Other necessary identification.

G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

PART 2 – PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Copies: Submit four copies of each submittal, unless otherwise indicated. Architect will return two copies.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data

are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.

3. Include the following information, as applicable:
   a. Manufacturer's written recommendations.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Manufacturer's catalog cuts.
   e. Compliance with recognized trade association standards.
   f. Compliance with recognized testing agency standards.
   g. Application of testing agency labels and seals.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:
   a. Dimensions.
   b. Identification of products.
   c. Fabrication and installation drawings.
   d. Roughing-in and setting diagrams.
   e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
   f. Design calculations.
   g. Compliance with specified standards.
   h. Notation of coordination requirements.
   i. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.

D. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups.

2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected.

4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Attach label on unexposed side that includes the following:
   a. Generic description of Sample.
   b. Product name or name of manufacturer.
   c. Sample source.

5. Number of Samples for Initial Selection: Submit full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one submittal with options selected.

6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

E. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for Construction Manager's action.

F. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

G. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."

I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."

B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

H. Design Data: Prepare written and graphic information, including, but not limited to,

performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

I. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

PART 3 – EXECUTION

3.1 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. "No Exception Taken": That part of the Work covered by the submittal may proceed provided that it complies with requirements of the Contract Documents; final acceptance will depend upon compliance.
2. "Make Corrections Noted": That part of the Work covered by the submittal may proceed provided it complies with the notations or correction on the submittal and requirements of the Contract Documents; final acceptance will depend upon corrections and compliance.
3. "Revise and Resubmit": Do not proceed with that part of the Work covered by the submittal. Revise or prepare a new submittal in accordance with the notations; resubmit for re-review without delay.
4. "Rejected": Do not proceed with that part of the Work covered by the submittal. Revise or prepare a new submittal in accordance with Contract Documents; resubmit for re-review without delay.
5. "Submit Specified Item": Do not proceed with that part of the Work covered by the submittal. This mark indicates that a non-specified item was submitted without proper approval of a substitution request. Prepare a new submittal that utilizes specified item or an approved substitution.

C. Do not permit submittals marked with any of the latter three actions to be used at the Project site, or elsewhere in connection with the Work.

D. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

E. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Products and installation for patching and extending Work.
2. Transition and adjustments.
3. Repair of damaged surfaces, finishes, and cleaning.

B. Related Sections:

1. Section 011100: Summary of Work, for Owner occupancy during construction.
2. Section 017329: Cutting and Patching.
3. Section 017400: Cleaning and Waste Management, for cleaning during construction.
4. Section 024119: Selective Demolition.

PART 2 – PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

A. New Materials: As specified in product Sections; match existing Products and Work for patching and extending work.

1. Where new materials are indicated in the Drawings and product Section for material is not included in the Project Manual, provide new materials specified in the Drawings.

B. Type and Quality of Existing Products: Determine by inspection and testing Products where necessary, referring to existing Work as a standard.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that demolition is complete, and areas are ready for installation of new Work.

3.2 PREPARATION

A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

C. Remove debris and abandoned items from area and from concealed spaces.

D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.

E. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity.

3.3 INSTALLATION

A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

B. Project Finishes: Complete in all respects including operational, mechanical and electrical work.

C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to specified condition.

D. Refinish visible existing surfaces to remain in renovated rooms and spaces to specified condition for each material, with a neat transition to adjacent finishes.

E. In addition to specified replacement of equipment and fixtures, restore existing plumbing, heating, ventilation, air conditioning, and electrical systems to full operational condition.

F. Install Products as specified in individual Sections.

3.4 TRANSITIONS

A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.

B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

3.5 ADJUSTMENTS

A. Where removal of partitions or walls results in the joining of adjacent spaces, rework the floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

B. Where a change of plane of 1/4” or more occurs, submit to Architect a recommendation for providing a smooth transition.

C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.

D. Fit work at penetrations of surfaces as specified in Section 017329, “Cutting and Patching”.

3.6 REPAIR OF DAMAGED SURFACES

A. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.

B. Repair substrate prior to patching finish.

3.7 FINISHES

A. Finish surfaces as specified in individual Product Sections.

B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.8 CLEANING

A. In addition to cleaning specified in Division 01 Sections, clean Owner-occupied areas affected by Work of this Project.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, security and protection facilities.

1.2 USE CHARGES

A. General: Include cost or use charges for temporary facilities in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's operational forces, Architect, testing agencies, and authorities having jurisdiction.

B. Existing Utility Services: Water and electric power from Owner's existing systems are available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to:

1. Building code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police and fire department rules.
5. Environmental protection regulations.

B. Standards: Comply with the following:

1. NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."
2. ANSI A10 Series standards for "Safety Requirements for Construction and Demolition."
3. NECA Electrical Design Library "Temporary Electrical Facilities."

C. Electric Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70 "National Electric Code."

D. Tests and Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS

A. Keep temporary services and facilities clean and neat in appearance.

B. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

C. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Provide new materials or use undamaged, used materials in serviceable conditions, suitable for use intended.

2.2 TEMPORARY FACILITIES

A. Temporary Offices/Storage, if Contractor chooses: Provide prefabricated portable storage facility within the enclosed project area or parking area. Note that locating this facility within the parking area will consume available parking provided by the owner; no additional parking will be provided. Dumpsters for the adjacent facility are stored in this area as well, so placement of the temporary storage must still allow for current day to day use of the dumpster by that entity.

B. Provide portable toilet within the enclosed project area.

2.3 EQUIPMENT

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

PART 3 – EXECUTION

3.1 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel.

1. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of the fixtures and facilities.

E. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

F. Lighting: Provide temporary lighting with local switching that will provide adequate illumination for construction operations, observations, and inspections.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

G. Heating: Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity.

3.2 SUPPORT FACILITIES

A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

B. Parking: Owner will provide up to 3 parking passes on Park St, adjacent to site. Contractor must coordinate with owner to procure parking passes.

C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

D. Project Identification Signs: Provide Project identification and other signs.

1. Provide temporary, directional signs for construction personnel and visitors.
2. Do not permit installation of unauthorized signs.

E. Water Disposal Facilities: Comply with requirements specified in Section 017419, Construction Waste Management.

F. Lifts and Hoists: Provide facilities for hoisting materials and employees.

1. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.

3.3 SECURITY AND PROTECTION FACILITIES

A. Environmental Protection:

1. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
2. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

B. Construction Enclosure Fence: The construction site is currently enclosed with a locking gate. Contractor will stage and work within this area and is responsible for security of this area during working hours. Contractor will ensure that the area is secure at the end of each working day.

C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structural adequate barricades, including warning signs and lighting.

1. Provide appropriate warning signs to inform personnel and the public of hazards being protected against.

D. Temporary Fire Protection: Install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses.

1. Comply with NFPA 10 and NFPA 241.
2. Store combustible materials in containers in fire safe locations.
3. Maintain unobstructed access to fire protection equipment.
4. Supervise welding operations, combustion type temporary heating units, and similar sources of fire ignition.
5. Develop and post information for overall fire prevention and protection program for personnel at Project site.

3.4 TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal.

C. Termination and Removal: Remove each temporary facility when the need for its service has ended no later than Substantial Completion.

D. Repair or replace street paving, curbs, and sidewalks damaged by construction operations, as required by the governing authority.

E. At Substantial Completion, clean and renovate permanent facilities used during the construction period.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in Project; product delivery, storage, and handling; manufacturer's standard warranties on products; and special warranties.

B. Related Sections:

1. Section 017700: Closeout Procedures, for submittal of warranties.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by the manufacturer's product name, including make or model number or other designation shown or listed in the manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed. Products salvaged or recycled from other products are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through substitution submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Refer to Section 012500 for product substitution procedures.

C. Basis of Design, or Standard of Design, Product Specification: Where the manufacturer's product is named and accompanied by the words "basis of design" or "standard of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.3 SUBMITTALS

A. Product List: Before Contractor's first request for payment, submit a complete list of major products proposed for use in the Project.

1. Include proprietary product names, manufacturer's name, and installing Subcontractor's name.

1.4 QUALITY ASSURANCE

A. Source Limitations: Provide products of the same kind from a single source to the fullest extent possible.

B. Compatibility of Products: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods for other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at the site.
2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, or other losses.
3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products subject to damage by weather under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Comply with manufacturer's written instructions for temperature, humidity, ventilation, and weather protection requirements for storage.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitation on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document specifically endorsed by manufacturer to Owner that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project specific information and properly executed.
2. Specified Form: When specified forms are included in the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 32 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700, "Closeout Procedures".

PART 2 – PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Where products are accompanied by the term “as selected,” Architect will make selection.
2. Where products are accompanied by the term “match sample,” sample to be matched is Architect’s.
3. Where products are specified by name and accompanied by the term “or equal” or “or approved equal” or “or approved,” submit product for Architect approval according to requirements of Section 012500, “Substitution Procedures” to obtain approval of an unnamed product.

B. Proprietary Specification Requirements: Where a single product or manufacturer is named, provide the product that complies with requirements. No substitutions are permitted.

C. Manufacturer/Source: Where a single manufacturer or source is named, provide a product by the named manufacturer or source that complies with requirements.

D. Manufacturers: Where Specifications include a list of manufacturers’ names, provide a product by one of the manufacturers listed that complies with requirements.

E. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements. Comply with provisions of Section 012500 for consideration of an unnamed product.

F. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed that complies with requirements. Comply with provisions of Section 012500 for consideration of an unnamed product.

G. Descriptive Specification Requirements: Where a product or assembly listing exact characteristics is required, provide a product or assembly that provides those characteristics and otherwise complies with requirements.

H. Performance Specification Requirements: Where compliance with performance requirements is specified, provide products that comply with those requirements and are recommended by the manufacturer for the application indicated.

I. Specified Standards, Codes, and Regulations: Where compliance with an imposed code, standard, or regulation is specified, provide a product that complies with that code, standard, or regulation.

J. Basis of Design, or Standard of Design, Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions of Section 012500 for consideration of an unnamed product by the other named manufacturers.

K. Visual Matching Specification: Where Contract Documents require matching an established sample, select a product that complies with requirements and matches Architect’s sample. Architect’s decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with provisions of Section 012500 for proposal of product.

L. Visual Selection Specification: Where Contract Documents include the phrase “as selected from manufacturer’s standard colors, patterns, textures” or a similar phrase, select a product that complies with other requirements.

1. Standard Range: Where Contract Documents include the phrase “standard range of colors, patterns, textures” or similar phase, Architect will select color, pattern, density, or texture from manufacturer’s product line that does not include premium items.
2. Full Range: Where Contract Documents include the phrase “full range of colors, patterns, textures” or similar phase, Architect will select color, pattern, density, or texture from manufacturer’s product line that includes both standard and premium items.

M. Inappropriate Product Selections: If Contractor believes specified product, method, or system is inappropriate for use, Contractor shall notify the Architect before performing Work in question.

1. If notice of objection is not received prior to delivery to site, it will be assumed by Owner that Contractor agrees specified products, methods, and systems are appropriate for use in the Project.

PART 3 – EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. Comply with manufacturer’s instructions and recommendations for installation of products in the applications indicated.

1. Anchor each product securely in place, accurately located and aligned with other Work.
2. Clean exposed surfaces and protect as necessary from damage and deterioration.

B. Should job conditions or specified requirements conflict with Manufacturers' instructions, consult Architect for further instructions.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes requirements for cutting, fitting, and patching of Work required to:

1. Make several parts fit properly.
2. Uncover work to provide for installing or inspecting (or both) of ill-timed work.
3. Remove and replace work not conforming to requirements of Contract Documents.
4. Remove and replace defective work.

B. Related Sections:

1. Section 013100: Project Management and Coordination, for coordinating cutting and patching with other construction activities.
2. Section 013516: Alteration Project Procedures, for building alterations.
3. Section 024119: Selective Demolition, for demolition of selected portions of the building for alterations.
4. Refer to individual Sections for specific requirements and limitations applicable to cutting and patching.

1.2 SUBMITTALS

A. Proposal for Cutting and Patching: Where cutting and patching involves structural elements, submit for approval a proposal describing procedures. Include the following information in the proposal:

1. Describe extent of cutting and patching required, how it will be performed, and why it cannot be avoided.
2. Indicate changes to structural elements, and changes in appearance of visual elements. Include structural calculations.
3. List products proposed for use and entities that will perform the Work.
4. Indicate dates that work will be performed, duration of the Work, and when work will be uncovered for Architect’s observation.
5. List utilities that cutting and patching work will affect.
6. Submit cost estimate and secure Architect's approval of cost estimate and type of reimbursement before proceeding with cutting and patching.

1.3 QUALITY ASSURANCE

A. Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain approval before cutting and patching structural elements.

B. Do not cut and patch operating elements in a manner that would reduce their capacity to perform as intended, cause increased maintenance, or decrease operational life or safety.

C. Do not cut and patch exposed elements of construction that in the Architect’s opinion would reduce the visual aesthetic qualities, or result in visual evidence of cutting and patching.

1. Remove and replace construction cut and patched in a visually unacceptable manner.

1.4 WARRANTY

A. Cut and patch construction using methods and with materials in such a manner as to not void any warranties required or existing.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Use new materials identical to existing materials.

B. For exposed surfaces where identical materials are not available, use materials that visually match existing adjacent surfaces as nearly as possible.

C. Use materials whose installed performance is equal or better to that of existing materials.

PART 3 – EXECUTION

3.1 INSPECTION

A. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.

B. After uncovering Work, inspect conditions affecting installation of new Work.

C. Discrepancies: If uncovered conditions are not as anticipated, immediately notify Architect and secure direction before proceeding further.

1. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Provide temporary support of work to be cut, including shoring and bracing as required to maintain structural integrity of Work.

B. Protect existing construction during cutting and patching to prevent damage.

3.3 GENERAL PERFORMANCE

A. Use skilled workers trained and experienced in necessary crafts and familiar with requirements and methods required to restore surfaces to their original condition.

B. Provide dust-proof barriers where necessary to protect existing surfaces.

3.4 CUTTING

A. Perform cutting and demolition by methods that will provide the least damage to other portions of Work.

B. Prior to cutting existing work, locate concealed utilities to eliminate possibility of service interruption or damage.

C. Cut through concrete or masonry with a carborundum masonry saw or diamond-core drill.

D. When masonry construction must be pierced, furnish and install a steel pipe sleeve in opening and grout in place neatly.

1. Leave grout surface to match existing finish.
2. Fabricate sleeve 1” in diameter larger than pipe or insulation.
3. Pack between sleeve and pipe with waterproof sealant.
4. At penetrations of fire-resistant rated walls, partitions, ceilings, or floor construction, completely seal voids with fire-resistant rated materials as required to maintain assembly of fire-resistant rating of penetrated element, or as required by Building Code.

3.5 PATCHING

A. Perform fitting and adjusting of products to provide a finished installation complying with tolerances and finishes specified for type of construction involved.

B. Where replacement of equipment and fixtures is required, restore existing plumbing, heating, ventilation, air-conditioning, electrical, and similar systems to full operational condition.

C. Refinish surfaces to match existing adjacent finishes, patching with seams that are durable and as invisible as possible.

1. Where possible, inspect and test patched area to demonstrate integrity of seam.
2. For continuous surfaces, refinish to nearest intersection or natural break.
3. For assembly, refinish entire unit.
4. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining work in manner that will eliminate evidence of patching and refinishing.

D. When finished surfaces are cut so that smooth transition with existing or new work is not possible, submit for Architect's approval a recommendation for terminating surface along straight line at natural line of division.

1. Where change of plane of 1/4" or more occurs, submit for Architect's approval a recommendation for providing smooth transition.

3.6 CLEANING

A. Clean areas and spaces where cutting and patching work is performed.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes requirements for maintaining Project buildings and site in a standard of cleanliness during construction period.

B. Related Sections:

1. Section 015000: Temporary Facilities and Controls, for removal of temporary facilities.
2. Section 017419: Construction Waste Management and Disposal.
3. Section 017700: Closeout Procedures.

1.2 QUALITY ASSURANCE

A. In addition to standards described in this Section, comply with applicable requirements of governmental agencies having jurisdiction.

PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Provide personnel, equipment, and materials as needed to maintain specified standard of cleanliness.

2.2 COMPATIBILITY

A. Use only cleaning materials and equipment that are compatible with surfaces being cleaned, as recommended by manufacturer of material.

PART 3 – EXECUTION

3.1 PROGRESS CLEANING

A. General: Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.

1. Completely remove all scrap, debris, and waste material from job site and dispose of in a legal manner.
2. Provide adequate storage for items and waste to be removed from job site, observing requirements for fire and environmental protection.

B. Storage Areas: Maintain stored items in an orderly arrangement allowing maximum access, which does not impede traffic or drainage.

1. Inspect arrangement of stored materials weekly. Restack, tidy, or otherwise service all arrangements.

C. Site and Structures:

1. Inspect site and structures weekly, and more often if necessary, and pick up all scrap, debris, and waste material.

a. Remove such items to a place designated for their storage. Maintain site in a neat and orderly condition.

2. Sweep area of construction clean, including interior areas if affected, as often as necessary to maintain a clean environment.

a. "Clean," for purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.

3. As required prior to installation of succeeding materials, clean structures or applicable portions thereof to degree of cleanliness recommended by manufacturer of succeeding material.

3.2 FINAL CLEANING

A. "Final Cleaning", for purpose of this Section, and except as may be specifically provided elsewhere, shall be interpreted as meaning level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to Substantial Completion, remove all tools, surplus materials, equipment, scrap, debris, and waste from Project site.

C. Broom-clean paved areas on site and public paved areas at approaches to site.

D. Exterior Surfaces:

1. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
2. Hose down entire exterior surfaces of structure if necessary to achieve a uniform degree of cleanliness.

E. Interior Surfaces:

1. Visually inspect interior surfaces affected by construction and remove all traces of soil, waste materials, smudges, and other foreign matter.
2. Remove paint droppings, spots, and stains.
3. Clean both sides of glass surfaces.

END OF SECTION

PART 1 – GENERAL

1.1 WASTE MANAGEMENT GOALS

A. Waste materials produced as a result of this project shall be reused or recycled to minimize impact of construction waste on landfills and to minimize expenditure of energy and cost in fabricating new materials.

1.2 WASTE MANAGEMENT PLAN

A. Reuse or recycle debris generated as a result of work performed on project when practicable and cost effective.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.1 ON-SITE MATERIALS SORTING AND STORAGE DURING CONSTRUCTION

A. Verify recycling facilities or waste processor requirements for preparation of materials to be accepted and to what degree materials can be contaminated.

B. Recycle the following waste materials:

1. Wood
2. Metals (ferrous and non-ferrous)
3. Cardboard
4. Drywall
5. Masonry and Concrete
6. Office paper
7. Vinyl.

C. Coordinate with local hauler to provide separate containers for recycled materials listed above.

1. Subcontractors shall follow source separation requirements for each type of waste, and use appropriate on-site container for each type of waste material.
2. Provide separate containers for non-recyclable materials.

D. Rebates: Paid or credited by hauler/recycler to Contractor.

E. Inform field personnel and subcontractors about recycling program, and continuously monitor program to verify proper source separation and to avoid contamination of recyclable materials.

F. Recycling Processors and Facilities:

1. Comprehensive list of recycling facilities in Portland metropolitan area is available from local building permit office or by contacting Metro at 503-234-3000.

2 Contractor is to provide receipts of waste materials, whether landfill or recycled, to owners.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:

1. Inspection procedures.
2. Project record documents.
3. Warranties.

B. Closeout requirements for specific construction activities are included in the appropriate Sections.

C. Related Sections:

1. Section 012000: Price and Payment Procedures, for requirements for Applications for Payment for Substantial and Final Completion.
2. Section 015000: Temporary Facilities and Controls, for removal of temporary facilities.
3. Section 017400: Cleaning and Waste Management, for final cleaning requirements.

1.2 SUBSTANTIAL COMPLETION

A. Prior to requesting construction observation for determining date of Substantial Completion, complete the following.

1. Prepare a list of items to be completed and corrected (Contractor's Punch List), the value of items on the list, and reasons why the Work is not complete.
2. Advise the Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final changeover of permanent locks and transmit keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems and instruction to Owner's personnel.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
11. Complete final cleanup requirements required in Section 017400.
12. Touch up and otherwise repair and restore marred, exposed finishes, including touchup painting.

B. Construction Observation: Submit a written request for Architect's observation of the Work for completion of Construction Contract requirements to establish date of Substantial Completion.

1. On receipt of request, the Architect will either proceed with observation of the Work, or without completing process of observation, advise Contractor that based on limited observation, the Work is not sufficiently complete for Substantial Completion.
2. Architect will prepare the Certificate of Substantial Completion after completion of observation of the Work, or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate can be issued.
   a. Architect will perform a final observation of the Work when assured by Contractor that deficiencies identified in previous observation have been completed or corrected.
   b. If additional observation(s) of the Work is required to establish Substantial Completion, the Owner will charge the Contractor to reimburse Architect for time and expenses.
   c. Results of the completed construction observation will form the basis of requirements for final acceptance.
3. Owner will allow Contractor no longer than 30 calendar days from Date of Substantial Completion to remedy deficiencies.

1.3 FINAL COMPLETION

A. Prior to requesting construction observation for determining date of Final Completion, complete the following.
   1. Submit a final Application for Payment, according to requirements of Section 012900.
   2. Submit certified copy of Architect's Substantial Completion list of deficient items to be completed or corrected, endorsed and dated by Architect, that states that each item has been completed, corrected, or otherwise resolved for acceptance.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Construction Observation: Submit a written request for Architect's observation of the Work for completion of Construction Contract requirements for final acceptance.
   1. On receipt of request, the Architect will either proceed with observation of the Work and specifically the Substantial Completion list of deficient items to be completed or corrected, or advise the Contractor of unfulfilled requirements.
   2. Architect will prepare the final Certificate for Payment after completion of observation of the Work, or will notify Contractor of Contract requirements that must be completed or corrected before certificate can be issued.
      a. Architect will perform a final observation of the Work when assured by Contractor that deficiencies identified in previous observation(s) have been completed or corrected.
      b. If additional observation(s) of the Work is required to establish Final Completion, the Owner will charge the Contractor to reimburse Architect for time and expenses.

1.4 LIST OF DEFICIENT ITEMS (PUNCH LIST)

A. Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if applicable, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential address order, starting at front elevation moving around building in a counter-clockwise direction.

2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3. Include the following information at the top of each page:
   a. Project name.
   b. Date.
   c. Name of Architect.
   d. Name of Contractor.
   e. Page number.

1.5 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes; protect from deterioration and loss.

B. Record Drawings: Maintain and submit one set of black line white prints of Contract Documents or Record CAD Drawings required.

1. Mark the Record Drawings to show the actual installation and construction where installation or construction varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to prepare the marked-up Record Drawings.
   a. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark record sets with erasable red-colored pencil, clearly describing change by graphic line and note. Use other colors to distinguish between changes for different categories of the Work at the same location.
   a. Call attention to entries by a “cloud” drawn around areas affected.

3. Mark important additional information that was either shown schematically or omitted from original Drawings.
   a. Conversion of Schematic Layouts: Show on Record Drawings, by dimension accurate to within one inch, centerline of each run of items shown schematically on Drawings. Clearly identify item by accurate note such as "cast iron drain", "galv. water", and the like. Show, by symbol or note, vertical location of item ("under slab", "in ceiling plenum", "exposed", and the like). Relate by identification descriptive to Specifications.
   b. Show final location of electrical fixtures.

4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.

5. Identify and date each Record Drawings; include the designation “PROJECT RECORD DRAWING” in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets with identification.

C. Record Specifications: Submit one complete copy of Project Specifications, including addenda and contract modifications.

1. Mark copy to indicate the actual product installation where installation or from that indicated in Specifications, addenda, and contract modifications.

2. Mark copy with proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

3. Note related Change Orders and other modifications, where applicable.

D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind miscellaneous records and identify each in same

format as specified for Operation and Maintenance Manuals, ready for continued use and reference.

1. One set of evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:
   a. Certificates of Inspection.
   b. Certificates of Occupancy.
2. One set of certificates of insurance for products and completed operations.
3. One set of evidence of payment and release of liens.
4. One copy of list of Subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

1.6 WARRANTIES

A. Submit one set of warranties, organized into an orderly sequence based on the table of contents of the Project Manual, in same format as specified for Operation and Maintenance Manuals.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION

PART 1 – GENERAL

1.1 SECTION REQUIREMENTS

A. Items indicated to be removed and salvaged remain Owner's property. Remove, clean, and deliver to Owner's designated storage area.

B. Comply with EPA regulations, and hauling and disposal regulations of authorities having jurisdiction.

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

D. It is not expected that hazardous materials will be encountered in the Work. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Consultant and Owner. Owner will remove hazardous materials under a separate contract.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.1 DEMOLITION

A. Maintain services/systems indicated to remain and protect them against damage during selective demolition operations. Before proceeding with demolition, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of the building.

B. Locate, identify, shut off, disconnect, and cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

C. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

D. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain or construction being demolished.

E. Provide temporary weather protection to prevent water leakage and damage to structure and interior areas.

F. Protect walls, ceilings, floors, and other existing finish work that is to remain. Erect and maintain dustproof partitions.

G. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.

H. Promptly remove demolished materials from Owner's property and legally dispose of them. Do not burn demolished materials.

3.2 EXTERIOR MOLD REMEDIATION

A. General: Institute of Inspection, Cleaning and Restoration Certification (IICRC) document S520 (“Standard and Reference Guide for Professional Mold Remediation”) and EPA document 402-k-01-001 (“Mold Remediation in Schools and Commercial Buildings”) were consulted in developing the following remediation protocol:

1. Moisture Source must be identified and repaired prior to beginning the remediation process. This work is outlined in the following technical sections.

2. Remediation workers will need to be properly equipped with protective equipment: Tyvek coveralls, gloves, respirator with HEPA cartridges and eye protection.
3. Contaminated OSB sheathing: Remove all exterior OSB sheathing contaminated with microbial growth and properly dispose. 10% of exterior OSB sheathing removal and replacement is included in the base bid.
4. Framing: Inspect all framing at locations where contaminated OSB is removed for surface growth or dry rot damage. Framing with surface growth can be cleaned through an abrasive method (sanding, scrapping and wiping) and treated with a wood preservative that contains a fungicide.
5. Any contaminated insulation should be removed and the interior face of the wall cavity should be reviewed for microbial contamination. In the event that the interior wall cavity is also contaminated, wipe down the surface with a disinfectant and contact the Owner's Consultant to review the contamination prior to installation of new material.
6. All flashing and moisture barrier and flashing details should be installed in accordance with the details and repair specifications.

END OF SECTION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Provide cast-in-place concrete curbs as indicated and specified in the contract documents.

1.2 STANDARDS

A. American Concrete Institute "Specifications for Structural Concrete for Buildings" (ACI-301).

B. American Concrete Institute "Field Reference Manual" (ACI SP-15).

C. ASTM C-94, C-143, C-150, C-231, C-260, C-309, C-494.

1.3 STORAGE AND HANDLING

A. Store and handle material in conformance with ACI 301, Article 2.5 and/or ASTM C-94, Paragraphs 6 and 7 as applicable.

1.4 ENVIRONMENTAL

A. Contractor shall assume all risks, in connection with placing concrete, of injurious effects due to weather.

B. Substrate requirements: Do not place concrete on muddy or frozen surfaces. Remove ice from frozen surfaces.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Comply with ACI-301 except as herein modified.

B. Portland Cement: ASTM C-150, Type 1 plain gray cement. Only one brand of approved cement shall be used for exposed concrete throughout the project.

C. Aggregates: ASTM C 33 and UBC Standard 26-2.

D. Water: Clean, free of contaminating material.

E. Air Entraining Admixture: ASTM C 260.

F. Water Reducing Admixture: ASTM C 494, Type A, water-reducing or Type D, water-reducing and retarding.

G. Synthetic Reinforcement Fibers: Collated, fibrillated, polypropylene fibers, 1/2-inch length, 80 to 110 ksi tensile strength, Fibermix by Fibermesh Company, Chattanooga, TN. (615) 892-7243. Portland, Oregon (503) 666-0817.

2.2 ACCESSORY MATERIALS

A. Solvent Based Resin Curing Compound: Burke Res-X, All Resin Base, Horn Horncure 30 C or 30 D, W.R. Meadows Sealtight AR-30 or AR-30 D.

B. Solvent Based Acrylic Curing Compound: Burke Spartan-Cote, Horn Clear Seal 150, Sonneborne Kure-N-Seal, W.R. Meadows Sealtight CS 309.

C. Concrete Curing Paper & Film: 6 mil polyethylene, black or clear, Sisalkraft SK-30 or SK-10 by St. Regis Paper Company.

D. Bonding Agent: ASTM C 932, ASTM C 881 and ASTM C 631. Hornweld by A.C. Horn, Weld-crete by Larsen, Thorobond by Thoro System Products, Sonocrete or Sonobond by Sonneborn.

E. Welded Wire Fabric, UBS Standard No. 26-6 and ASTM A 185, rolls and flat sheets, wire size and spacing as shown on Drawings.

F. Miscellaneous Accessories: Epoxy grout crack patching material.

2.3 CONCRETE PROPORTIONING

A. Compressive Strength: Deck Slabs: 3,000 psi at 28 days.

B. Cement: 517 pounds (5-1/2 sacks) minimum per cubic yard concrete (5.5 sacks).

C. Water / Cement ratio: 6.23 gallons (52 gallons) of water per 100# cement maximum.

D. Entrained Air: 5% +/- 1% entrained air for all exterior flatwork and concrete exposed to weather.

E. Maximum Slump: ASTM C-143, 4-inches for footings and all flatwork. 5-inches for other concrete. Allowable deviation = 1/2-inch to -1-inch.

F. Synthetic Reinforcement Fibers: 3/4-pounds per cubic yard in slabs-on-grade, sidewalks, curbs and concrete fill on wood decks where shown on Drawings. Exclude Synthetic Reinforcement Fibers at public sidewalk, driveway apron and public curb and gutter.

PART 3 – EXECUTION

3.1 PLACING CONCRETE

A. Notify the Building Official at least 24 hours before the scheduled time of each pour. Obtain approval of Building Official prior to placing concrete, if required.

B. Mixing and placing: Comply with ACI-301, Chapters 7 and 8.

3.2 CURING

A. Curing Compound for exterior concrete: Spray-apply solvent-based resin curing compound to concrete surface after finishing as soon as concrete is free of surface water, at manufacturer's recommended rate.

B. Curing Compound for Interior Concrete: Spray, broom or wool applicator. Apply solvent-based acrylic curing compound at manufacturer's recommended rate.

C. Apply Concrete Curing Paper & Film as required to protect concrete from weather and damage.

3.3 PHYSICAL BARRIER PROTECTION

A. Barricade area containing fresh concrete slabs at decks for 24 hours minimum.

B. Provide and install plywood cover over concrete subject to worker traffic.

C. Repair at no additional cost to the Owner any damage to concrete work due to failure to provide adequate physical barrier protection.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fiberglass-mat faced, moisture- and mold-resistant gypsum sheathing.

B. Related Sections:

1. Section 061053: Miscellaneous Rough Carpentry.
2. Section 076200: Sheet Metal Flashing.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM) International:

1. ASTM C 473: Standard Test Methods for Physical Testing of Gypsum Panel Products.
2. ASTM C 518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
3. ASTM C 1002: Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
4. ASTM C 1177: Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
5. ASTM C 1280: Standard Specification for Application of Gypsum Sheathing.
6. ASTM D 3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
7. ASTM D 6329: Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers.
8. ASTM E 72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
9. ASTM E 96: Standard Test Methods for Water Vapor Transmission of Materials.

B. Gypsum Association (GA): Publication GA-253, “Application of Gypsum Sheathing”.

1.3 SUBMITTALS

A. Product Data: Manufacturer’s specifications and installation instructions for each product specified.

1.4 WARRANTY

A. Provide products that offer 12 months of coverage against in-place exposure damage (delamination, deterioration and decay).

B. Manufacturer’s Warranty:

1. Five years against manufacturing defects.
2. Ten years against manufacturing defects when used as a substrate in architecturally-specified Exterior Insulation and Finish System (EIFS).

PART 2 – PRODUCTS

2.1 WALL SHEATHING

A. Georgia-Pacific Gypsum LLC

1. Fiberglass-Mat Faced Gypsum Sheathing: DensGlass Sheathing.
2. Fiberglass-Mat Faced Gypsum Sheathing, Type X for Fire Rated Designs: DensGlass Fireguard Sheathing.

2.2 MATERIALS

A. Fiberglass-Mat Faced Gypsum Sheathing (ASTM C 1177):

1. Thickness: 1/2 inch.
2. Width: 4 feet.
3. Length: 8 feet, 9 feet or 10 feet.
4. Weight: 1.9 lbs./sq. ft.
5. Edges: Square.
6. Surfacing: Fiberglass mat on face, back, and long edges.
7. Racking Strength (ultimate, not design value; ASTM E 72): Not less than 540 pounds per square foot, dry.
8. Flexural Strength, Parallel (ASTM C 473): 80 lbf, parallel.
9. Humidified Deflection (ASTM C 1177): Not more than 1/4 inch.
10. Permeance (ASTM E 96): 23 perms.
11. R-Value (ASTM C 518): 0.56.
12. Mold Resistance (ASTM D 3273): 10, in a test as manufactured.
13. Microbial Resistance (ASTM D 6329; GREENGUARD 3-week protocol): Will not support microbial growth.

B. Fire-Rated Fiberglass-Mat Faced Gypsum Sheathing (ASTM C 1177; Type X):

1. Thickness: 5/8 inch.
2. Width: 4 feet.
3. Length: 8 feet, 9 feet or 10 feet.
4. Weight: 2.5 lbs./sq. ft.
5. Edges: Square.
6. Surfacing: Fiberglass mat on face, back, and long edges.
7. Racking Strength (ultimate, not design value; ASTM E 72): Not less than 654 pounds per square foot, dry.
8. Flexural Strength, Parallel (ASTM C 1177): 100 lbf, parallel.
9. Humidified Deflection (ASTM C 1177): Not more than 1/8 inch.
10. Permeance (ASTM E 96): Not more than 17 perms.
11. R-Value (ASTM C 518): 0.67.
12. Mold Resistance (ASTM D 3273): 10, in a test as manufactured.
13. Microbial Resistance (ASTM D 6329; GREENGUARD 3-week protocol): Will not support microbial growth.

2.3 ACCESSORIES

A. Screws: ASTM C 1002, corrosion-resistant treated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Inspection: Verify that project conditions and substrates are acceptable to the installer to begin installation of work of this section.

3.2 INSTALLATION

A. General: In accordance with GA-253, ASTM C 1280 and the manufacturer's recommendations.

1. Manufacturer's Recommendations:

a. Current "Product Catalog", Georgia-Pacific Gypsum.

3.3 PROTECTION

A. Protect gypsum board installations from damage and deterioration until date of Substantial Completion.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

A. Provide EIFS with Air and Moisture Barrier for vertical above grade exterior wall substrate surfaces.

B. RELATED SECTIONS

C.

1. Section 061600: Sheathing
2. Section 061643: Gypsum Sheathing
3. Section 076200: Sheet Metal Flashing and Trim
4. Section 079200: Sealants and Caulking

1.02 SUBMITTALS

A. Manufacturer's specifications, details, installation instructions and product data.

B. Manufacturer’s code compliance report.

C. Manufacturer's standard warranty.

D. Applicator's certificate of instruction.

E. Samples for approval as directed by architect or owner.

F. EPS board manufacturer's certificate of compliance with ASTM E 2430

G. Sealant manufacturer's certificate of compliance with ASTM C 1382.

H. Prepare and submit project-specific details (when required by contract documents).

1.03 REFERENCES

A. ASTM Standards:

1. B 117 Test Method for Salt Spray (Fog) Testing
2. C 578 Specification for Preformed, Cellular Polystyrene Thermal Insulation
3. C 1177 Specification for Glass Mat Gypsum for Use as Sheathing
4. C 1382 Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems (EIFS) Joints
5. D 522 Test Methods for Mandrel Bend Test of Attached Organic Coatings
6. D 882 Standard Test Methods for Tensile Properties of Thin Plastic Sheeting
7. D 968 Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive
8. D 1784 Specification for Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
9. D 2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
10. D 3273 Test for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
11. E 84 Test Method for Surface Burning Characteristics of Building Materials
12. E 96 Test Methods for Water Vapor Transmission of Materials

13. E 119 Method for Fire Tests of Building Construction and Materials
14. E 283 Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences Across the Specimen
15. E 330 Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
16. E 331 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
17. E 1233 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Difference
18. E 2098 Test Method for Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish System after Exposure to a Sodium Hydroxide Solution
19. E 2134 Test Method for Evaluating the Tensile-Adhesion Performance of an Exterior Insulation and Finish System (EIFS)
20. E 2273 Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish System (EIFS) Clad Wall Assemblies
21. E 2430 Specification for Expanded Polystyrene (EPS) Thermal Insulation Boards for use in Exterior Insulation and Finish Systems (EIFS)
22. E 2485 Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water Resistive Barrier Coatings
23. E 2486 Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS)
24. E 2570 Test Method for Water-Resistive (WRB) Coatings used Under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage
25. G 153 Recommended Practice for Operating Light-and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials
26. G 154 Recommended Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

B. Building Code Standards

1. AC235 Acceptance Criteria for EIFS Clad Drainage Wall Assemblies (April, 2008)

C. National Fire Protection Association (NFPA) Standards

1. NFPA 268, “Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source”
2. NFPA 285, “Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non-Load-Bearing Wall Assemblies containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus”

D. Other Referenced Documents

1. American Association of Textile Chemists and Colorists AATCC-127 Water Resistance: Hydrostatic Pressure Test
2. GA-600 Fire Resistance Design Manual
3. APA Engineered Wood Association E 30, Engineered Wood Construction Guide
4. ICC-ES ESR-1748, Evaluation Report for StoTherm NExT EIFS.
5. ICC-ES ESR-1233, Evaluation Report for StoGuard

1.04 DESIGN REQUIREMENTS

A. Wind Load

1. Design for maximum allowable system deflection, normal to the plane of the wall, of L/240.
2. Design for wind load in conformance with code requirements.

B. Moisture Control

1. Prevent the accumulation of water behind the EIF system, either by condensation or leakage through the wall construction, in the design and detailing of the wall assembly.

   a. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall.

   b. Air Leakage Prevention-- provide continuity of air barrier system at foundation, roof, windows, doors and other penetrations through the system with connecting and compatible air barrier components to minimize condensation and leakage caused by air movement.
   c. Vapor Diffusion and Condensation-- perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust insulation thickness and/or other wall assembly components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.

C. Impact Resistance

1. Provide ultra-high impact resistance to a minimum height of 6'-0" (1.8 m) above finished grade at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or impact. Indicate the areas with impact resistance other than “Standard” on contract drawings.

D. Color Selection:

1. Select finish coat with a light reflectance value of 20 or greater. (The use of dark colors is not recommended with EIF Systems that incorporate expanded polystyrene [EPS]. EPS has a service temperature limitation of approximately 160° F [71°C]).

E. Joints

1. Design minimum 3/4 inch (19 mm) wide expansion joints in the EIFS where they exist in the substrate or supporting construction, where the EIFS adjoins dissimilar construction or materials, at changes in building height, and at floor lines in multi-level wood frame construction.
2. Design minimum 1/2 inch (13 mm) wide perimeter sealant joints at all penetrations through the EIFS (windows, doors, etc.).
3. Specify compatible backer rod and sealant that has been evaluated in accordance with ASTM C 1382, “Test Method for Determining Tensile Adhesion

Properties of Sealants When Used in Exterior Insulation and Finish System (EIFS) Joints," and that meets minimum 50% elongation after conditioning.

4. Design joints so that Air Barrier continuity is maintained across the joint and drain joints to the exterior.

F. Grade Condition

1. Do not specify EIFS below grade (unless designed for use below grade and permitted by code) or for use on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 6 inch (152 mm) clearance above finished grade as required by code.

G. Trim, Projecting Architectural Features and Reveals

1. All trim and projecting architectural features must have a minimum 1:2 [27°] slope along their top surface. All horizontal reveals must have a minimum 1:2 [27°] slope along their bottom surface. Increase slope for northern climates to prevent accumulation of ice/snow and water on surface. Where trim/feature or bottom surface of reveal projects more than 2 inches (51 mm) from the face of the EIFS wall plane, protect the top surface with waterproof base coat. Periodic inspections and increased maintenance may be required to maintain surface integrity of EIFS on weather exposed sloped surfaces. Limit projecting features to easily accessible areas and limit total area to facilitate maintenance and minimize maintenance. Refer to Sto details 1.04a and 1.04b.
2. Do not use EIFS on weather exposed projecting ledges, sills, or other projecting features unless supported by framing or other structural support and protected with metal coping or flashing. Refer to Sto detail 10.61.

I. Insulation Thickness

1. Minimum EPS insulation thickness is 1 inch (25 mm).
2. Maximum EPS insulation thickness is 12 inches (305 mm) when installed in accordance with ESR-1748 (including architectural features).

H. Fire Protection

1. Do not use foam plastic in excess of 12 inches (305 mm) thick on noncombustible type construction unless approved by the code official.
2. Where a fire-resistance rating is required by code use EIFS over rated assembly (EIFS is considered to not add or detract from the fire-resistance of the rated assembly).
3. Refer to manufacturer's applicable code compliance report for other limitations that may apply.

1.05 PERFORMANCE REQUIREMENTS

Table 1—Air/Moisture Barrier Performance

TEST	METHOD	CRITERIA	RESULT
1. Water Penetration Resistance	AATCC 127 (Water Column)	Resist 21.6 in (55 cm) water for 5 hours before and after aging	Pass

2. Water Penetration Resistance after Cyclic Wind Loading	ASTM E 1233 / ASTM E 331	No water at exterior plane of sheathing after 10 cycles @ 80% design load and 75 minutes water spray at 6.24 psf (299 Pa) differential	No water penetration on Plywood, OSB, and Glass Mat Faced Gypsum sheathings
3. Water Resistance Testing	ASTM D 2247	Absence of deleterious effects after 14 day exposure	No deleterious effects
4. Water Vapor Transmission	ASTM E 96 Method B (Water Method)	Measure	Sto Gold Fill®*: 17.3 perms [994 ng/(Pa·s·m^2)]
5. Air Leakage	ASTM E 283	<0.06 cfm/ft^2 (0.00030m^3/s•m^2)	<0.0044 cfm/ft^2 (0.000022 m^3/s•m^2)
6. Structural Integrity	ASTM E 330	2-inches (51 mm) H_2O pressure (positive & negative) for 1 hour.	Pass
7. Dry Tensile Strength	ASTM D 882	20 lbs/in (3503 N/m), minimum before and after aging	Sto Gold Fill:* 159 lbs/in (27845 N/m)) before aging 213 lbs/in (37302 N/m) after aging
8. Pliability	ASTM D 522	No Cracking or Delamination using ⅛" (3 mm) mandrel at 14°F (-10°C) before and after aging	Pass
9. Surface Burning	ASTM E 84	Flame Spread 0 – 25 for NFPA Class A, UBC Class I	Flame Spread: 5 Smoke Density: 10
10. Tensile Adhesion	ASTM C 297	>15 psi (103 kPa)	>30 psi (207 kPa) to Plywood, OSB, Glass Mat Faced Gypsum sheathings

* Note: Sto Gold Fill testing with Sto Detail Mesh reinforcement

Table 2—EIFS Weather Resistance and Durability Performance

TEST	METHOD	CRITERIA	RESULTS
1. Accelerated Weathering	ASTM G 153 (Formerly ASTM G 23)	No deleterious effects* at 2000 hours when viewed under 5x magnification	Pass @ 2000
2. Accelerated Weathering	ASTM G 154 (Formerly ASTM G 53)	No deleterious effects* at 2000 hours when viewed under 5x magnification	Pass @ 4000 hours
3. Freeze/Thaw Resistance	ASTM E 2485	No deleterious effects* at 10 cycles when viewed under 5x magnification	Pass @ 90 cycles
4. Water Penetration	ASTM E 331 (modified per ICC-ES AC 235)	No water penetration beyond the plane of the base coat/EPS board interface after 15 minutes at 6.24 psf (299 Pa) or 20% of design wind pressure, whichever is greater	Pass at 12.0 psf (575 Pa) after 30 minutes
5. Drainage Efficiency	ASTM E 2273	90% minimum	> 99%

6. Tensile Adhesion	ASTM E 2134	Minimum 15 psi (103kPa) tensile strength	Pass
7. Water Resistance	ASTM D 2247	No deleterious effects* at 14 day exposure	Pass @ 28 days
8. Salt Spray	ASTM B 117	No deleterious effects* at 300 hours	Pass @ 500 hrs
9. Abrasion Resistance	ASTM D 968	No cracking or loss of film integrity at 528 quarts (500 L) of sand	Pass @ 1057 quarts (1000 L)*
10. Mildew Resistance	ASTM D 3273	No growth supported during 28 day exposure period	Pass @ 42 days
11. Impact Resistance	ASTM E 2486	Level 1: 25-49 in-lbs (2.83-5.54J) Level 2: 50-89 in-lbs (5.65-10.1J) Level 3: 90-150 in-lbs (10.2-17J) Level 4: >150 in-lbs (>17J)	Pass with one layer Sto Mesh Pass with two layers Sto Mesh Pass with one layer Sto Intermediate Mesh Pass with one layer Sto Armor Mat and one layer Sto Mesh

*No deleterious effects: no cracking, checking, crazing, erosion, rusting, blistering, peeling or delamination

Table 3—EIFS and Air/Moisture Barrier Fire Performance

TEST	METHOD	CRITERIA	RESULT
1. Fire Endurance	ASTM E 119	Maintain fire resistance of existing rated assembly	Pass*
2. Intermediate Scale Multi-Story Fire Test	NFPA 285 (UBC Standard 26-9)	1. Resistance to vertical spread of flame within the core of the panel from one story to the next 2. Resistance to flame propagation over the exterior surface 3. Resistance to vertical spread of flame over the interior surface from one story to the next 4. Resistance to significant lateral spread of flame from the compartment of fire origin to adjacent spaces	Pass with 12 inches of EPS insulation *
3. Radiant Heat Ignition	NFPA 268	No ignition @ 20 minutes	Pass with 12 inches of EPS insulation

4.Surface Burning (individual components)	ASTM E 84	Individual components shall each have a flame spread of 25 or less, and smoke developed of 450 or less	Flame: 0 Smoke Developed: 5

Note: * indicates results based on extrapolation of data from series testing. ASTM E119 testing performed on assembly with 4 inch (305 mm) thick EPS.

Table 4—EIFS Component Performance

TEST	METHOD	CRITERIA	RESULT
1. Alkali Resistance of Reinforcing Mesh	ASTM E 2098	Greater than 120 pli (21 dN/cm) retained tensile strength	Pass
2. Requirements for Rigid PVC Accessories	ASTM D 1784	Meets cell classification 13244C	Pass

1.06 QUALITY ASSURANCE

A. Manufacturer requirements

1. Member in good standing of the EIFS Industry Members Association (EIMA).
2. System manufacturer for a minimum of twenty-five (25) years.
3. Manufacturing facilities ISO 9001:2000 Certified Quality System.
4. Manufacturer’s wall assembly listed in Gypsum Association Fire Resistance Design Manual.

B. Contractor requirements

1. Engaged in application of EIFS for a minimum of three (3) years.
2. Knowledgeable in the proper use and handling of Sto materials, possessing certificate of completion for Sto on-line applicator test.
3. Employ skilled mechanics who are experienced and knowledgeable in EIFS application, and familiar with the requirements of the specified work.
4. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.
5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications.

C. Insulation board manufacturer requirements

1. Recognized by Sto as capable of producing insulation board to meet system requirements, and hold a valid licensing agreement with Sto.
2. Listed by an approved agency.
3. Label insulation board with information required by Sto, the approved listing agency and the applicable building code.

D. Mock-up Testing

1. Construct full-scale mock-up of typical EIFS/window wall assembly with specified tools and materials and test air and water infiltration and structural performance

in accordance with ASTM E 283, E 331 and E 330, respectively, through independent laboratory. Mock-up shall comply with requirements of project specifications. Where mock-up is tested at job site maintain approved mock-up at site as reference standard. If tested off-site accurately record construction detailing and sequencing of approved mock-up for replication during construction.

E. Inspections

1. Provide independent third party inspection where required by code or contract documents.
2. Conduct inspections in accordance with code requirements and contract documents.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.

B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32° C). Store away from direct sunlight.

C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

1.08 PROJECT/SITE CONDITIONS

A. Maintain ambient and surface temperatures above 40°F (4°C) during application and drying period, minimum 24 hours after application of Air/Moisture barrier and EIFS.

B. Provide supplementary heat for installation in temperatures less than 40°F (4°C).

C. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.09 COORDINATION/SCHEDULING

A. Provide site grading such that EIFS terminates above finished grade a minimum of 6 inches (150 mm) or as required by code.

B. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuous air and moisture barrier.

C. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall.

D. Coordinate installation of windows and doors so air barrier components are connected to them to provide a continuous air barrier.

E. Install window and door head flashing immediately after windows and doors are installed.

F. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.

G. Install copings and sealant immediately after installation of the EIF system and when EIFS coatings are dry.

H. Attach penetrations through EIFS to structural support and provide water tight seal at penetrations.

1.10 WARRANTY

A. Provide manufacturer's standard warranty.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Provide Air/Moisture Barrier, EIF System and accessories from single source manufacturer or approved supplier.

B. The following are acceptable manufacturers:

1. Sto Corp.--Air/Moisture Barrier, EIF System

2. Plastic Components, Inc.--Accessories

2.02 AIR/MOISTURE BARRIER

A. StoGuard™

1. Joint Compound: Sto Gold Fill—ready mixed flexible joint compound for rough opening protection and joint treatment of wall sheathing (not required for concrete/masonry surfaces).
2. Waterproof Coating: Sto Gold Coat®—ready mixed waterproof coating for wall substrates and sheathings.

2.03 ADHESIVE

A. Cementitious Adhesives

1. Sto BTS® Plus—one-component, polymer-modified, cement based high build adhesive (for use over exterior glass mat faced gypsum sheathing (compliant with ASTM C 1177), exterior cementitious sheathing, concrete, masonry or cement plaster surfaces. Also used over exterior or Exposure I OSB and plywood sheathing when protected with StoGuard).

2.04 INSULATION BOARD

A. Nominal 1.0 lb/ft^3 (16 kg/m^3) Expanded Polystyrene (EPS) insulation board in compliance with ASTM E 2430 and ASTM C 578 Type I requirements (*Note: minimum required thickness is 1 inch [25 mm] and maximum allowable thickness is 12 inches [305 mm] when installed in accordance with ICC-ES ESR 1748.)*

2.05 BASE COAT

A. Cementitious Base Coat (see 2.03 for product description)

1. Sto BTS Plus.

2.06 REINFORCING MESHES

A. Standard Mesh

1. Sto Mesh--nominal 4.5 oz./yd^2 (153 g/m^2), symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials *(achieves Standard Impact Classification).*

B. High Impact Mesh

1. Sto Intermediate Mesh--nominal 11.2 oz./yd^2 (380 g/m^2), high impact, interwoven, open weave glass fiber fabric with alkaline resistant coating for compatibility with Sto materials *(achieves High Impact Classification).*

C. Ultra-High Impact Mesh

1. Sto Armor Mat--nominal 15 oz./yd^2 (509 g/m^2), ultra-high impact, double strand, interwoven, open-weave glass fiber fabric with alkaline resistant coating for compatibility with Sto materials *(recommended to a minimum height of 8'-0" [1.8m]above finished grade at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or impact. Achieves Ultra-High Impact Classification when applied beneath Sto Mesh).*

D. Specialty Meshes

1. Sto Detail Mesh--nominal 4.2 oz/yd^2 (143 g/m^2), flexible, symmetrical, interlaced glass fiber fabric, with alkaline resistant coating for compatibility with Sto materials *(used for standard EIFS backwrapping, aesthetic detailing, and reinforcement of sheathing joints and protection of rough openings with air/ moisture barrier).*

2.07 PRIMER

A. Sto Primer Smooth – acrylic-based tintable primer for spray application.

2.08 FINISH COAT

A. Stolit® Lotusan® – acrylic-based textured wall coating with graded marble aggregate and color to match existing.

2.09 JOB MIXED INGREDIENTS

A. Water--Clean and potable.

B. Portland cement--Type I, Type II, or Type I-II in conformance with ASTM C 150.

2.10 ACCESSORIES

A. Starter Track— Rigid PVC (polyvinyl chloride) plastic track Part No. STDE as furnished by Plastic Components, Inc., 9051 NW 97th Terrace, Miami, Florida 33178 (800 327-7077) or equivalent.

2.11 MIXING

A. Sto Gold Fill--mix with a clean, rust-free high speed mixer to a uniform consistency.

B. Sto Gold Coat--mix with a clean, rust-free high speed mixer to a uniform consistency.

C. Sto BTS Plus--mix ratio with water: 5-6.5 quarts (4.7-6.2 L) of water per 47 pound (21.3 kg) bag of Sto BTS Plus. Pour water into a clean mixing pail. Add Sto BTS Plus, mix to a uniform consistency and allow to set for approximately 5 minutes. Adjust mix if necessary with additional Sto BTS Plus or water and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent. Do not exceed maximum water amount in mix ratio.

D. Sto BTS Silo--mix by machine with StoSilo spray equipment at a water flow rate setting of 450-600 L/hr.

E. Sto BTS Xtra- Mix ratio with water: 4.75-5 quarts (4.5-4.7L) of water per 38 pound (17.2kg) bag of Sto BTS Xtra. Pour water into a clean mixing pail, add Sto BTS Xtra, mix to a uniform consistency and allow to set for approximately 5 minutes. Adjust mix if necessary with additional Sto BTS Xtra or water and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent. Do not exceed maximum water amount in mix ratio.

F. Sto RFP--mix with a clean, rust-free high speed mixer to a uniform consistency.

G. Sto Flexyl--mix ratio with portland cement: 1:1 ratio by weight. Pour Sto Flexyl into a clean mixing pail. Add portland cement, mix to a uniform consistency and allow to set for approximately five minutes. Adjust mix if necessary with additional Sto Flexyl and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent.

H. Sto primer--mix with a clean, rust-free high speed mixer to a uniform consistency.

I. Stolit--mix with a clean, rust-free high speed mixer to a uniform consistency. A small amount of water may be added to adjust workability. Limit addition of water to amount needed to achieve the finish texture

J. Mix only as much material as can readily be used.

K. Do not use anti-freeze compounds or other additives.

PART 3 – EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. Prequalify under Quality Assurance requirements of this specification (section 1.06 B).

3.02 EXAMINATION

A. Inspect surfaces for:
1. Contamination—algae, chalkiness, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances.
2. Surface absorption and chalkiness.
3. Cracks—measure crack width and record location of cracks.
4. Damage and deterioration.
5. Moisture content and moisture damage—use a moisture meter to determine if the surface is dry enough to receive the EIFS and record any areas of moisture damage.

6. Compliance with specification tolerances—record areas that are out of tolerance (greater than ¼ inch in 8-0 feet [6mm in 2438 mm] deviation in plane).

B. Inspect sheathing application for compliance with applicable requirement:

1. Glass Mat Faced gypsum sheathing compliant with ASTM C 1177.
2. Exterior Grade and Exposure I wood based sheathing–APA Engineered Wood Association E 30
3. Cementitious sheathing--Consult manufacturer's published recommendations

C. Report deviations from the requirements of project specifications or other conditions that might adversely affect the Air/Moisture Barrier and EIFS installation to the General Contractor. Do not start work until deviations are corrected.

3.03 SURFACE PREPARATION

A. Remove surface contaminants on concrete and concrete masonry surfaces.

B. Apply conditioner by sprayer or roller to chalking or excessively absorptive surfaces.

C. Replace weather-damaged sheathing and repair damaged or cracked surfaces.

D. Level surfaces to comply with required tolerances.

E. Repair cracks, spalls or damage in concrete or concrete masonry surfaces.

3.04 INSTALLATION

A. Air/Moisture Barrier

For installation over exterior or Exposure I Plywood, and Glass Mat Faced Gypsum Sheathing in compliance with ASTM C 1177:

1. Protect rough openings, joints and parapets: apply Sto Gold Fill joint compound by trowel over rough openings, sheathing joints, inside and outside corners, and tops of parapets. Immediately embed reinforcing mesh in the wet joint compound and trowel smooth. Embed minimum 4 inch (101 mm) wide mesh at sheathing joints and minimum 9 inch (152 mm) wide mesh at rough openings, inside and outside corners and tops of parapets (refer to Sto detail 10.23a for detailed information on proper protection of rough openings and sequencing of work at rough openings).
2. Spot fasteners with Sto Gold Fill joint compound.
3. Apply waterproof coating by roller over sheathing surface, including the dry joint compound, to a uniform wet mil thickness of 10 mils in one coat. Use ½ inch (13 mm) nap roller for plywood and gypsum sheathing. Use ¾ inch (19 mm) nap roller for glass mat faced gypsum sheathing. Protect from weather until dry.
4. Coordinate installation of connecting air barrier components with other trades to provide a continuous air tight membrane.
5. Coordinate installation of flashing and other moisture protection components with other trades to achieve complete moisture protection such that water is directed to the exterior, not into the wall assembly, and drained to the exterior at sources of leaks (windows, doors and similar penetrations through the wall assembly).

For Installation over Exposure I OSB (Oriented Strand Board) sheathing:

1. Apply waterproof coating with a ¾ inch (19 mm) nap roller to sheathing surface to a uniform wet mil thickness of 10 mils. Protect from weather until dry. Then follow steps 1-5 above.

For Installation over Concrete or Concrete Masonry Unit (CMU) surfaces:

1. Repair cracks up to 1/8 inch (3 mm) wide with Sto Gold Fill. Rake the crack with a sharp tool to remove loose or friable material and blow clean with oil-free compressed air. Apply Sto Gold Fill by spray, trowel or putty knife over the crack and tool surface smooth. For cracks wider than 1/8 inch (3mm) up to ¼ inch (6mm) wide, use a paintable acrylic latex caulk to fill crack, tool flush, and allow to dry. (*Note: For moving cracks or cracks larger than ¼ inch (6mm), consult with a structural engineer for repair method).* Protect repair from weather until dry.

2. Liberally apply two coats of Sto Gold Coat to the surface with a ¾ inch nap roller or spray equipment to a minimum wet thickness of 10 mils each and up to a total maximum of 30 mils depending on surface condition. Additional coats may be necessary to provide a void and pinhole free surface. Protect from weather until dry.

3. Coordinate installation of connecting air barrier components with other trades to provide a continuous air tight membrane.

4. Coordinate installation of flashing and other moisture protection components with other trades to achieve complete moisture protection such that water is directed to the exterior, not into the wall assembly, and drained to the exterior at sources of leaks (windows, doors and similar penetrations through the wall assembly).

B. Starter Track

1. Strike a level line at the base of the wall to mark where the top of the starter track terminates.
2. Attach the starter track even with the line into the structure a maximum of 16 inches (406 mm) on center with the proper fastener: Type S-12 corrosion resistant screws for steel framing with minimum 3/8 inch (9 mm) penetration, and galvanized or zinc coated nails for wood framing with minimum 3/4 inch (19 mm) penetration. Attach between studs into blocking as needed to secure the track flat against the wall surface. For solid wood sheathing or concrete/masonry surfaces, attach directly at 12 inches (305 mm) on center maximum.
3. Butt sections of starter track together. Miter cut outside corners and abut. Snip front flange of one inside corner piece (to allow EPS Board to be seated inside of track) and abut.
4. Install Starter Track at other EIF System terminations as designated on detail drawings: above roof along dormers or gable end walls, and beneath window sills with concealed flashing.

C. Splice Strips for Starter Track and Flashing

1. Starter Track, Window/Door Head Flashing and Side Wall Step Flashing: install 2 inch (51 mm) wide diagonal splice strips of detail mesh at ends of head flashings. Install minimum 4 inch (100 mm) wide splice strips of detail mesh between back flange of starter track, head flashings and roof/side wall step flashing. Center the mesh so it spans evenly between the back flange of the Starter Track or flashing and the sheathing. Embed the mesh in the wet joint compound and trowel smooth.

2. Apply waterproof coating over the splice strip when the joint compound is dry (refer to Sto Details 10.00 and 10.23b).

D. Backwrapping

1. Apply a strip of detail mesh to the dry air/moisture barrier at all system terminations (windows, doors, expansion joints, etc.) except where the Starter Track is installed. The mesh must be wide enough to adhere approximately 4 inches (100 mm) of mesh onto the wall, be able to wrap around the insulation board edge and cover a minimum of 2 ½ inches (64 mm) on the outside surface of the insulation board. Adhere mesh strips to the air/moisture barrier and allow them to dangle until the backwrap procedure is completed (paragraph I.1). Alternatively, pre-wrap terminating edges of insulation board.

E. Adhesive Application and Installation of Insulation Board

1. Rasp the interior lower face of insulation boards to provide a snug friction fit into the Starter Track. *(Note: rasping prevents an outward bow at the Starter Track).*
2. Apply adhesive to the back of the insulation board with the proper size stainless steel notched trowel. Apply uniform ribbons of adhesive parallel with the SHORT dimension of the board so that when boards are placed on the wall the ribbons will be VERTICAL. Apply adhesive uniformly so ribbons of adhesive do not converge.
3. Immediately place insulation boards in a running bond pattern on the wall with the long dimension horizontal. Start by inserting the lower edge of the boards inside the starter track at the base of the wall until they contact the bottom of the track. Apply firm pressure over the entire surface of the boards to ensure uniform contact of adhesive. Bridge sheathing joints by a minimum of 6 inches (152 mm). Interlock inside and outside corners.
4. Butt all board joints tightly together to eliminate any thermal breaks in the EIFS. Care must be taken to prevent any adhesive from getting between the joints of the boards.
5. Cut insulation board in an L-shaped pattern to fit around openings. Do not align board joints with corners of openings.
6. Remove individual boards periodically while the adhesive is still wet to check for satisfactory contact with the substrate and the back of the insulation board, and for spacing between ribbons of adhesive. An equal amount of adhesive must be on the substrate and the board when they are removed, as an indication of adequate adhesion. Do not use nails, screws, or any other type of non-thermal mechanical fastener.

F. Adhesive Application and Installation of EPS Board with StoSilo Spray Equipment

1. Apply Sto BTS Silo material to the prepared sheathing to a rough thickness of 1/4” (6 mm). Form uniform vertical ribbons of adhesive by directing the proper size stainless steel notched trowel from the bottom of the wall upward. Immediately install insulation boards in accordance with steps E.3-E.6 above. If adhesive develops a “skin” before the insulation board is installed remove the adhesive and replace with fresh material.

G. Slivering and Rasping of Insulation Board Surface

(Note: EPS insulation board exposed to sunlight will develop a powdery residue on the surface. This residue must be entirely removed by rasping the surface)

1. After insulation boards are firmly adhered to the substrate, fill any open joints in the insulation board layer with slivers of insulation or spray foam. Use spray foam that is identified by the spray foam manufacturer as suitable for this use.
2. Rasp the insulation board surface to achieve a smooth, even surface and to remove any ultraviolet ray damage.

H. Trim, Reveals and Projecting Aesthetic Features

1. Attach features and trim where designated on drawings with adhesive to the insulation board or sheathing surface. Slope the top surface of all trim/features minimum 1:2 (27°) and the bottom of all horizontal reveals minimum 1:2 (27°).
2. Cut reveals/aesthetic grooves with a hot-knife, router or groove-tool in locations indicated on drawings.
3. Offset reveals/aesthetic grooves minimum 3 inches (75 mm) from insulation board joints.
4. Do not locate reveals/aesthetic grooves at high stress areas such as corners of windows, doors, etc.
5. A minimum ¾ inch (19 mm) thickness of insulation board must remain at the bottom of the reveals/aesthetic grooves.

I. Completion of Backwrapping

1. Complete the backwrapping procedure by applying base coat to exposed edges of insulation board and approximately 4 inches (100 mm) onto the face of the insulation board. Pull mesh tight around the board and embed it in the base coat with a stainless steel trowel. Use a corner trowel for clean, straight lines. Smooth any wrinkles or gaps in the mesh.

J. Base Coat and Reinforcing Mesh Application

1. Apply minimum 9x12 inch (225x300 mm) diagonal strips of detail mesh at corners of windows, doors, and all penetrations through the system. Embed the strips in wet base coat and trowel from the center to the edges of the mesh to avoid wrinkles.
2. Apply detail mesh at trim, reveals and projecting architectural features. Embed the mesh in the wet base coat. Trowel from the base of reveals to the edges of the mesh.
3. Ultra-High impact mesh application (recommended to a minimum height of 6’-0" [1.8 m] above finished grade at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or impact, and where indicated on contract drawings): apply base coat over the insulation board with StoSilo spray equipment or a stainless steel trowel to a uniform thickness of approximately 1/8 inch (3 mm). Work horizontally or vertically in strips of 40 inches (1016 mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Butt the mesh at seams. Allow the base coat to dry.
4. Standard mesh application: Apply base coat over the insulation board, including areas with Ultra-High impact mesh, with StoSilo spray equipment or a stainless steel trowel to a uniform thickness of approximately ⅛ inch (3 mm). Work horizontally or vertically in strips of 40 inches (1016mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap mesh not less than 2-½ inches (64 mm) at mesh seams and at overlaps of detail mesh. Feather seams and edges. Double wrap all inside and outside corners with minimum 2-½ inch (64 mm) overlap in each direction. Avoid wrinkles in the mesh. The mesh must be fully embedded so that no mesh color

shows through the base coat when it is dry. Re-skim with additional base coat if mesh color is visible.

5. Sloped Surfaces: for trim, reveals, aesthetic bands, cornice profiles, sills or other architectural features that project beyond the vertical wall plane more than 2 inches (51 mm) apply waterproof base coat with a stainless steel trowel to the weather exposed sloped surface and minimum four inches (100 mm) above and below it. Embed standard mesh or detail mesh in the waterproof base coat and overlap mesh seams a minimum of 2-½ inches (65 mm).
6. Allow base coat to thoroughly dry before applying primer or finish.

Note: All trim and projecting architectural features must have a minimum 1:2 [27°] slope along their top surface. All horizontal reveals must have a minimum 1:2 [27°] slope along their bottom surface. Increase slope for northern climates to prevent accumulation of ice/snow and water on surface. Where trim/feature or bottom surface of reveal projects more than 2 inches (51 mm) from the face of the EIFS wall plane, protect the weather exposed sloped surface with waterproof base coat. ***Insulation maximum thickness is 12 inches (305 mm), which also includes trim and architectural features, when installed in accordance with ICC-ES ESR-1748.*** *Periodic inspections and increased maintenance may be required to maintain surface integrity of EIFS on sloped weather exposed surfaces. Limit projecting features to easily accessible areas and limit total area to facilitate maintenance and minimize maintenance burden. Refer to Sto details 1.04a and 1.04b.*

K. Primer application

1. Apply primer evenly with brush, roller or proper spray equipment over the clean, dry base coat and allow to dry thoroughly before applying finish.

L. Finish Coat Application

1. Apply finish directly over the base coat or primed base coat when dry. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:

   a. Avoid application in direct sunlight.
   b. Apply finish in a continuous application, and work to an architectural break in the wall.
   c. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.
   d. Do not install separate batches of finish side-by-side.
   e. Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.
   f. Do not apply finish over irregular or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.

3.05 PROTECTION

A. Provide protection of installed materials from water infiltration into or behind them.

B. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.

3.06 CLEANING, REPAIR AND MAINTENANCE

A. Clean and maintain the Exterior Insulation and Finish System (EIFS) for a fresh appearance and to prevent water entry into and behind the system. Repair cracks, impact damage, spalls or delamination promptly.

B. Maintain adjacent components of construction such as sealants, windows, doors, and flashing, to prevent water entry into the wall assembly.

C. Refer to Sto reStore Repair and Maintenance Guide (reStore Program) for detailed information on EIFS restoration - cleaning, repairs, recoating, resurfacing and refinishing, or re-cladding.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes materials and installation of fluid-applied waterproof air barrier membrane over vertical above grade concrete walls.

B. Related Requirements:

1. Section 076000: Flashing and Sheet Metal.
2. Section 079200: Joint Sealants.

1.3 DEFINITIONS

A. Air Barrier Material: A primary element that provides a continuous barrier to the movement of air.

B. Air Barrier Accessory: A transitional component of the air barrier that provides continuity.

C. Air Barrier Auxiliary Material: A transitional component that provides air barrier continuity furnished by a source other than the primary air barrier manufacturer.

D. Air Barrier Assembly: The collection of air barrier materials, accessory and auxiliary materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PRE-INSTALLATION MEETINGS

A. Pre-Installation Conference:

1. Review air barrier installation requirements and installation details, mock-ups, testing requirements, protection, and sequencing of work.

1.5 REFERENCES

A. Building Code and Material Evaluation Service Standards:

1. 2009 International Building Code (IBC).
2. 2009 International Energy Conservation Code (IECC).

B. ASTM Standards:

1. C 297-94, Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane.
2. D 522-93a, Test Methods for Mandrel Bend Test of Attached Organic Coatings.
3. D 3273-00, Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
4. D 4541-09, Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
5. E 84-98, Test Method for Surface Burning Characteristics of Building Materials.
6. E 96-00, Test Method for Water Vapor Transmission of Materials.
7. E 779-10, Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.

8. E 783-02, Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
9. E 1186-03 (2009), Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.
10. E 1827-96 (2007), Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door.
11. E 2178-03, Test Method for Air Permeance of Building Materials.
12. E 2357-05, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

C. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE):

1. 2005 ASHRAE Handbook – Fundamentals.
2. ASHRAE 90.1 – 2010, Energy Standard for Buildings Except Low-Rise Residential Buildings.

1.6 COORDINATION/SCHEDULING

A. Coordinate installation of windows, doors and other wall penetrations to provide a continuous air barrier.

B. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall.

C. Provide sill flashing to direct water to the exterior before windows and doors are installed.

D. Install window and door head flashing immediately after windows and doors are installed.

E. Install diverter flashings wherever water can enter the assembly to direct water to the exterior.

F. Install parapet cap flashing and similar flashing at copings and sill to prevent water entry into the wall assembly.

1.7 SUBMITTALS

A. Manufacturer’s specifications, details and product data.

B. Manufacturer’s standard warranty.

C. Manufacturer’s ICC evaluation report confirming compliance with the IBC, IRC, and IECC as an air barrier and water-resistive barrier.

D. Samples for approval as directed by architect or owner.

E. Shop drawings: Substrate joints, cracks, flashing transitions, penetrations, corners, terminations, and tie-ins with adjoining construction, interfaces with separate materials that form part of the air barrier assembly.

1.8 QUALITY ASSURANCE

A. Manufacturer Requirements:

1. Manufacturer of exterior wall waterproofing and air barrier materials for a minimum of 30 years in North America.
2. ISO 9001:2000 Certified Quality System and ISO 14001:2004 Certified Environmental Management System.

B. Contractor Requirements:

1. Knowledgeable in the proper use and handling of Sto materials.

2. Employ skilled mechanics who are experienced and knowledgeable in waterproofing and air barrier application, and familiar with the requirements of the specified work.

3. Provide the proper equipment, manpower and supervision on the jobsite to install the air barrier assembly in compliance with the project plans and specifications, shop drawings, and Sto's published specifications and details.

C. Regulatory Compliance:

1. Primary air barrier and joint treatment reinforcement materials:

a. Listed by IBC and recognized for use on all types of construction.
b. Listed by CCMC and recognized for use on all types of construction.
c. Comply with ASHRAE 90.1 – 2010.
d. Comply with ASHRAE 189.1 – 2009.

1.9 PRE-CONSTRUCTION TESTING

A. Conduct testing by qualified test agency or building envelope consultant.

1. Conduct assembly air leakage testing in accordance with ASTM E 783.

2. Conduct adhesion testing to substrates in accordance with ASTM D 4541.

3. Conduct wet sealant compatibility testing in accordance with sealant manufacturer's field quality control test procedure.

4. Notify design professional minimum 7 days prior to testing.

1.10 DELIVERY, STORAGE AND HANDLING

A Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.

B. Protect coatings (pail products) from freezing temperatures and temperatures in excess of 90 degrees F (32 degrees C). Store away from direct sunlight.

C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

D. Protect and store accessory and auxiliary products in accordance with manufacturer's written instructions.

1.11 PROJECT/SITE CONDITIONS

A. Maintain ambient and surface temperatures above 40 degrees F (4 degrees C) during application and drying period, minimum 24 hours after application of waterproof air barrier materials.

B. Provide supplementary heat for installation in temperatures less than 40 degrees F (4 degrees C) or if surface temperature is likely to fall below 40 degrees F (4 degrees C).

C. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.12 WARRANTY

A. Provide manufacturer's standard warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Sto Corp.

B. Obtain primary air barrier and accessory air barrier materials from single source.

2.2 MATERIALS

A. Primary Air Barrier Material: StoGuard with Sto EmeraldCoat ready-mixed flexible spray- or roller-applied waterproof air barrier membrane material.

B. Accessory Materials:

1. Joint Treatments
   a. Sto EmeraldCoat with StoGuard Fabric: Flexible waterproof air barrier membrane material.
2. Joint Reinforcements
   a. StoGuard Mesh: Nominal 4.2 oz/yd^2 (142 g/m^2) self-adhesive, flexible, symmetrical, interlaced glass fiber reinforcing mesh, with alkaline-resistant coating for compatibility with Sto materials.
   b. StoGuard Fabric: Non-woven integrally reinforced cloth reinforcement.
   c. StoGuard RediCorner™: Non-woven integrally reinforced pre-formed cloth.
3. Transition Membranes
   a. Sto Gold Fill with StoGuard Mesh: Ready-mixed flexible trowel- or spray-applied air barrier material with treated glass fiber reinforcing mesh.
   b. StoGuard RapidSeal or StoGuard RapidSeal with StoGuard Mesh: Moisture cure elastomeric waterproof air barrier material with treated glass fiber reinforcing mesh (where applicable).
   c. Sto VaporSeal with StoGuard Fabric: Flexible waterproof air barrier membrane material with non-woven integrally reinforced cloth.
   d. StoGuard Tape: Self-adhering rubberized asphalt tape with polyester fabric facing.
4. Primers
   a. StoGuard Primer: Rubber resin emulsion primer for use with StoGuard Tape to enhance adhesion and allow installation down to 35 degrees F (1.7 degrees C).

C. Auxiliary Materials:

1. Wet sealant: Tremco Spectrem 1 and Spectrem 2 sealants.
2. Pre-cured sealant tape: Dow 123.
3. Spray adhesive: 3M Super 77 Spray Adhesive.
4. Spray foam: Dow Great Stuff for Gaps and Cracks.

D. Patch and Leveling Material for Concrete and Masonry:

1. Sto Leveler: Polymer-modified cementitious patch and leveling material for prepared concrete and masonry surfaces up to 3/8 inch (10 mm).
2. Sto BTS Xtra: Polymer-modified lightweight cementitious patch and leveling material for prepared concrete and masonry surfaces up to 1/8 inch (3 mm).

2.3 PERFORMANCE REQUIREMENTS

A. Durability, resistance to aging, water and water penetration resistance, structural loading: joint treatment and primary air barrier material, comply with ICC ES AC 212.

B. Flexibility: ASTM D 522, primary air barrier material, no cracking or delamination before and after aging using 1/8 inch (3 mm) mandrel at 14º F (10º C).

C. Nail sealability: ASTM D 1970, 7.9.1, primary air barrier passes.

D. Material air leakage: ASTM D 2178, primary air barrier and joint treatment ≤ 0.004 cfm/ft^2 at 1.57 psf (0.02 L/s·m^2 at 75 Pa).

E. Resistance to mold: ASTM D 3273, no mold growth after 28 day exposure.

F. Adhesion: Joint treatment and primary air barrier material, ASTM C 297 or D 4541, ≥ 30 psi (207 kPa), or exceeds strength of glass mat facing on glass mat gypsum susbstrates.

G. Surface burning: ASTM E 84, joint treatment and primary air barrier material flame spread ≤ 25, smoke developed ≤ 450, Class A building material.

H. Water vapor permeance: ASTM E 96 Method B, > 10 perms (570 ng/Pa·s·m^2).

I. Assembly air leakage: ASTM E 2357, ≤ 0.04 cfm/ft^2 (0.2 L/s·m^2) air leakage after conditioning protocol.

J. Field adhesion testing: ASTM D 4541, ≥ 30 psi (207 kPA) or exceeds strength of glass mat facing on glass mat gypsum substrates.

K. Building envelope air leakage: ASTM E 779 or 1827, ≤ 0.4 cfm/ft^2 (2 L/s·m^2).

L. Volatile Organic Compounds: SCAQMD Rule 1113, joint treatment and primary air barrier material ≤ 100 g/L.

M. Water-resistive barrier: ICC ES AC 212, joint treatment and primary air barrier comply and are listed in a valid ICC ESR.

2.4 DESIGN CRITERIA

A. Structural (Wind and Axial Loads):

1. Design for maximum allowable deflection normal to the plane of the wall: L/240.
2. Design for wind load in conformance with code requirements.

B. Moisture Control:

1. Prevent the accumulation of water in the wall assembly and behind the exterior wall cladding:
   a. Minimize condensation within the assembly.
   b. Drain water directly to the exterior where it is likely to penetrate components in the wall assembly (windows and doors, for example).
   c. Provide corrosion resistant flashing to direct water to the exterior in accordance with code requirements, including: above window and door heads, beneath window and door sills, at roof/wall intersections, floor lines, decks, intersections of lower walls with higher walls, and at the base of the wall.

C. Air Barrier Continuity: Provide continuous air barrier assembly of compatible air barrier components.

D. Substrates:

1. Brick: Provide normal weight units with flush joints (struck flush with the surface) and allow for a minimum of 2 coats of the primary air barrier material, or a cementitious parge coat to fill and level irregular surfaces and 1 coat of the primary air barrier material, prior to the air barrier application, such that a void and pinhole free air barrier surface is achieved.

E. Mechanical Ventilation: Maintain pressurization and indoor humidity levels in accordance with recommendations of ASHRAE (see 2005 ASHRAE Handbook—Fundamentals).

PART 3 – EXECUTION

3.1 EXAMINATION

A. Inspect concrete and brick surfaces for:

1. Contamination: Algae, dirt, dust, efflorescence, form oil, fungus, grease, mildew or other foreign substances.
2. Surface deficiencies: Weak, friable, chalkiness, laitance, bugholes, and spalls.
3. Cracks: Measure crack width and record location of cracks.
4. Damage or deterioration.
5. Moisture content and moisture damage: Use a moisture meter to determine if the surface is dry enough to receive the waterproof air barrier and record any areas of moisture damage or excess moisture.
6. Flush masonry mortar joints completely filled with mortar.

B. Report deviations from the requirements of project specifications or other conditions that might adversely affect the waterproof air barrier installation. Do not start work until deviations are corrected.

3.2 SURFACE PREPARATION

A. Concrete Masonry:

1. Remove surface contamination and weak surface conditions. Use chemical cleaners such as TSP (trisodium phosphate) detergent to remove oil and grease and rinse with potable water. Use chemical cleaners to remove efllorescence or other surface contamination in accordance with manufacturer's written instructions. Use mechanical methods such as waterblasting, sandblasting, and wire brushing to remove weak surface conditions.
2. Repair cracks up to 1/8 inch (3 mm) wide by raking with a sharp tool to remove loose, friable material and blow clean with oil-free compressed air. Apply joint treatment material over crack, embed reinforcement (where applicable), and smooth joint treatment material with a trowel, drywall or putty knife to cover the reinforcement.
3. Remove projecting fins, ridges, and mortar by mechanical means. Remove excess mortar from masonry ties, lintels and shelf angles.
4. Fill honeycombs, aggregate pockets, holes and other voids with patching material.

3.3 INSTALLATION

A. Coordinate work with other trades to ensure air barrier continuity with connections at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.

B. Rough Opening Protection:

1. Install transition membrane into and around rough opening. Refer to Sto details 20.03a-e and applicable Sto product bulletins.

C. Transitions:

1. Install air barrier accessory materials (with reinforcement where applicable), or auxiliary material at transition areas: foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line. Refer to Sto Tech Hotline No. 0211-BSc and applicable Sto product bulletins.

D. Waterproof Air Barrier Membrane:

1. Concrete: Install one coat of Sto EmeraldCoat by spray or roller in a uniform, continuous wet film of 10 mils to the prepared concrete substrate. Do not install over working or moving joint sealants.

3.4 FIELD QUALITY CONTROL

A. Owner's qualified testing agency or building envelope consultant shall perform inspections and tests.

B. Inspections: Air barrier materials are subject to inspection to verify compliance with requirements.

1. Condition of substrates and substrate preparation.

2. Installation of primary air barrier material, accessory materials, and compatible auxiliary materials over structurally sound substrates and in conformance with architectural design details, contractor's shop drawings, project mock-up, and manufacturer's written installation instructions.

3. Air barrier continuity and connections without gaps and holes at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.

C. Tests: Air barrier materials and assembly are subject to tests to verify compliance with performance requirements:

1. Qualitative air leakage test: ASTM E 1186.

2. Quantitative air leakage test: ASTM E 779, E 783, and E 1827.

3. Adhesion test: ASTM D 4541.

4. Qualitative adhesion and compatibility testing: Wet sealant manufacturer's field quality control adhesion test.

D. Repair non-conforming substrates and air barrier material installation to conform with project requirements.

E. Take corrective action to repair and replace, reinstall, seal openings, gaps, or other sources of air leakage to conform with project performance requirements.

3.5 PROTECTION AND CLEANING

A. Protect air barrier materials from damage during construction caused by wind, rain, freezing, continuous high humidity, or prolonged exposure to sunlight.

B. Protect air barrier materials from damage from trades, vandals, and water infiltration during construction.

C. Repair damaged materials to meet project specification requirements.

D. Clean spills, stains, soiling from finishes or other construction materials that will be exposed in the completed work with compatible cleaners.

E. Remove all masking materials after work is completed.

END OF SECTION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Provide flashing and sheet metal as indicated on Drawings and specified herein:

1. New saddle flashing at parapets.
2. New standing seam parapet cap flashing.
3. New saddle flashing at structural steel through wall penetrations
4. New EIFS bottom termination flashings at finished grade, roofing and door/louver assemblies.
5. New counter flashings at EIFS bottom terminations at roofing areas.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 079200: Sealants and Caulking.

1.3 QUALITY ASSURANCE

A. Standards:

1. Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA) "Residential Sheet Metal Guidelines" – First Edition 2001. Conform to details and installation procedures unless otherwise indicated on Drawings.
2 SMACNA "Architectural Sheet Metal Manual" – Fifth Edition. Conform to details and installation procedures unless otherwise indicated on Drawings.
3. Roofing manufacturer's roof installation specifications unless otherwise indicated on Drawings.

1.4 SUBMITTALS

A. Samples: Submit samples of factory-finished metal for selection.

1.5 WARRANTY

A. Provide installer's written warranty against defects in materials and workmanship for a period of two (2) years.

B. Provide manufacturer's standard 20-year warranty on pre-coated steel sheets.

1.6 PERFORMANCE

A. Flashing and sheet metal work to be free from water leakage under all weather conditions.

PART 2 – PRODUCTS

2.1 FLASHING, SHEET METAL, ACCESSORIES

A. Flashing and Sheet Metal: Pre-coated sheet metal, 26-gauge minimum.

B. Concealed Fasteners: Hot-dip galvanized steel or cadmium plated steel screws.

C. Exposed Fasteners: Hot-dip galvanized steel or cadmium plated steel screws with neoprene grommeted washers. Finish fasteners to match coil-coated sheet metal where exposed to view.

D. Sealants: Refer to Section 079200, Sealants and Caulking.

1. Tape Sealants: PVC Medium Density Foam.
2. Wet sealants: Sonolastic VLM 150.

E. Self-Adhered Membrane Flashing (SAMF): Butyl based, cross-laminated self-adhered flashing membrane consistent with ASTM E 2112.

2.2 TOUCH-UP PAINT

A. Furnished by pre-painted steel manufacturer and shall match color of Coil Coated Steel.

PART 3 – EXECUTION

3.1 FABRICATION

A. Fabricate each metal section in as long a run as possible, 10-feet minimum. Avoid scratching or chipping Coil Coated Steel coating in both fabrication and installation. Fabricate work in accordance with current industry standards and practices.

B. Fabricate all flashing without seams, with appropriate slope to drain and with closed ends.

3.2 PREPARATION

A. Verify that surfaces to be covered with sheet metal are smooth and free from defects. Clean surfaces by removing dirt, rubbish, and other foreign materials before starting sheet metal work. Drive projecting nails flush with roof sheathing or surface of sheet metal over shingles. Do not overdrive fasteners. Commencement of work indicates acceptance of substrate surfaces by sheet metal contractor.

3.3 INSTALLATION

A. Install work in accordance with Contract Documents, manufacturer's printed Instructions, SMACNA "Architectural Sheet Metal Manual" and current industry standards and practices. Fabricate to profiles shown on drawings.

B. Install flashing plumb, straight, true and watertight.

C. Vertical legs of flashing are to be weather-lapped with SAMF or weather-resistive barrier (WRB) by minimum of 3” or more.

D. Where flashing sections are joined, all flashing sections are to be overlapped a minimum of 6”.

E. All overlapped flashing sections are to be sealed with sealant.

1. Two parallel 3/8”-diameter beads of sealant applied across flashing section.
2. Compress flashing sections to create visible squeeze out.
3. Clean away excess sealant.

F. Locations of new flashing:

1. New saddle flashing at parapets, partition walls and guardrails:
   a. Fabricate new saddle flashing to be installed at parapets as shown on Drawings.
   b. Fabricate new saddle flashing from minimum 26-gauge pre-coated sheet metal.
   c. Flashing to be fully soldered and bedded in sealant.
   d. Weather lap with WRB by 2” minimum.
2. New standing seam parapet cap flashing:
   a. Fabricate new saddle flashing to be installed at parapets as shown on Drawings.
   b. Fabricate new saddle flashing from minimum 26-gauge pre-coated sheet metal.
   c. Flashing to be fully soldered and bedded in sealant.
   d. Contractor to tie in new cap flashing with existing flashing. The location to be determined during the demolition phase of this project.

3. New cap flashing:

   a. Fabricate new saddle flashing to be installed at partition wall and guardrail as shown on Drawings.
   b. Fabricate new saddle flashing from minimum 26-gauge pre-coated sheet metal.
   c. Flashing to be fully soldered and bedded in sealant.
   d. Contractor to tie in new cap flashing with existing flashing. The location to be determined during the demolition phase of this project.

4. New sill pan flashing:

   a. Fabricate new sill pan flashing to be installed at parapets as shown on Drawings.
   b. Integrate flashing with existing waterproofing and bed in sealant.

3.4 ADJUST AND CLEAN

A. Replace or repair damaged sheet metal and flashing and/or any shingles that have become damaged as a result of repair work.

B. Remove excess sealant from exposed surfaces.

C. Clean sheet metal and flashing.

D. Remove all debris from gutter and downspouts. Remove debris and excess materials from site including excess fasteners and metal cuttings.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes flexible, self-adhering sheet flashing including, but not limited to, the following applications:

1. For protection against water and air infiltration around windows and doors and around other openings in walls.

B. Related Sections:

1. Section 014339: Mockups.
2. Section 076000: Flashing and Sheet Metal.
3. Section 079200: Joint Sealants.

1.2 SUBMITTALS

A. Product Data including manufacturer's installations, and general recommendations for each specified flashing material.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed work similar in material, design and extent to that indicated for this Project.

1.4 COORDINATION

A Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation.

PART 2 – PRODUCTS

2.1 FLEXIBLE SELF-ADHERING MEMBRANE FLASHING

A. Subject to compliance with requirements, provide one of the following products:

1. Grace Construction Products: Grace Ultra.

2.2 ACCESSORIES

A. DuPont Commercial Sealant.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which work of this Section will be installed.

1. Verify that substrates are ready to receive Work of this Section.
2. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install flexible, self-adhering sheet flashing in accordance with manufacturer's written installation instructions.

B. Install flexible, self-adhering sheet flashing at the following locations, and where indicated in the Drawings:

1. Perimeters of window openings.

2. Perimeters of door openings.
3. Wall penetrations.
4. Vertical leg of sheet metal flashing over horizontal running trim.

C. Window Openings with Flanged Windows: Install at perimeters of window openings as follows, as detailed in the Drawings, unless otherwise recommended by manufacturer:

1. Install as per AAMA 2400-02 or Tyvek window flashing instructions.

3.3 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage at the time of Substantial Completion.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. Provide a single component, very low-modulus, high-movement, non-sag, fast-curing, ready-to-use, polyurethane sealant.

B. Related Sections: Other specification sections that relate directly to the work of this section include the following:

1. Section 072400: Exterior Insulation and Finishing Systems
2. Section 076000: Flashing and Sheet Metal.
3. Section 076526: Self-Adhering Sheet Flashing.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Material Safety Data Sheets.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: The manufacturer shall be a company with at least five years experience and regularly engaged in the manufacture and marketing of products specified herein. The manufacturer shall have an ISO 9001-2000 certified quality system.

B. Installer's Qualifications: The contractor shall be qualified to perform the work specified by reason of experience, with a minimum of 3 years experience and 3 projects of similar scope.

C. Mock-Ups:

1. At start of Project, perform free-standing mock-up of required sealant work. Perform minimum of one (1) mock-up for each different combination of substrates to be sealed. Coordinate mock-up areas with Architect.
2. Install mock-ups and test in presence of sealant manufacturer’s authorized representative and Architect to assure installation procedures are consistent with warranty requirements.
3. After sealant has achieved sufficient cure as coordinated with manufacturer’s representative, conduct adhesion pull-tests, or non-destructive testing, at discretion of Architect. Conduct tests per ASTM C1521.
    a. Confirm results of adhesion tests as acceptable by Architect, Owner or Owner’s representative, and sealant manufacturer prior to proceeding with work.
4. Leave approved mock-ups in place to establish standards and guidelines for acceptable installation of sealant work and acceptable appearance.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.

B. Store products in a dry area, off of the ground, with temperature maintained between 60 and 70 degrees F (16 and 21 degrees C). Protect from direct sunlight and extreme heat (90 degrees F (32 degrees C) and freezing.

C. Handle products in accordance with manufacturer's printed recommendations.

PART 2 – PRODUCTS

2.1 MATERIALS

A. A single component, very low-modulus, high-movement, non-sag, fast-curing, ready-to-use, silyl-terminated polyether sealant. ASTM C 920 compliance: Comply with the following:

1. Manufacturer: Tremco Dymonic low-modulus modified polyurethane joint sealant.
2. Performance and Physical Properties: Meet or exceed ASTM C 920:
    a. Type and Grade: S (single component) and NS (nonsag).
    b. Class: 25 for vertical joints.
    c. Use Related to Exposure: NT (nontraffic).
    d. Uses Related to Joint Substrates: M, A and, as applicable to joint substrates indicated, O.

B. Accessories:

1. Closed-Cell Backer Rod.
2. Primer: To match manufacturer’s specifications.

PART 3 – EXECUTION

3.1 INSTALLATION OF WEATHERPROOFING JOINT SEALANTS

A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.

B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas and landscaping from contact due to handling of materials.

C. Surface Preparation: Comply with manufacturer's printed instructions and the following.

1. Remove loose materials and foreign matter that impair adhesion of joint sealant.
2. Clean surfaces of bond-inhibiting materials including oil, dust and dirt, laitance and standing water.

D. Priming: Comply with manufacturer's printed instructions and the following.

1. Apply primer full strength with brush or clean, lint-free cloth. Apply primer to a light, uniform coating. Porous surfaces require more primer. Do not over apply, or allow primer onto face of substrate.
2. Allow primer to dry before applying joint sealants.
3. Prime and seal on same workday.

E. Application: Comply with manufacturer's printed instructions and the following.

1. Install appropriate size backer rod, larger than joint per manufacturer's recommendations, and in manner to provide concave sealant profile.
2. Where joint depth does not permit installation of backer rod, install adhesive-backed polyethylene bond-breaker tape along entire back of joint to prevent 3-sided adhesion of joint sealant.
3. Verify that temperature and moisture conditions are within manufacturer’s acceptable limits.
4. Using fresh sealant and equipment that is in proper working order, completely fill joint with sealant, filling from bottom up to avoid entrapping air.
5. Using clean, dry tool with rounded edge, and of appropriate width for each joint, tool freshly installed sealant to provide preferred concave profile, to ensure intimate contact between sealant and substrate, and to provide neat appearance. Where surface aggregate does not permit proper tooling, install sealant and backer rod so that face of joint is recessed behind exposed aggregate, and sealant is bonded to

firm, even surface.

6. Use dry tooling method. Do not use tooling agents such as soapy water or solvents that have not been approved by sealant manufacturer.

F. Curing

1. Curing of joint sealants varies with temperature and humidity. The following times assume 75 degrees F (24 degrees C), 50 percent relative humidity, and joints 1/2 inch (13 mm) wide by 1/4 inch (6 mm).

   a. Skins: Within 1 hour.
   b. Functional: Within 3 days.
   c. Full Cure: Approximately 1 week.

G. Cleaning: Remove excess material before material cures. If material has cured, remove using mechanical methods that will not damage substrate.

END OF SECTION

SECTION 07 92 03

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes one-component, ultra-low modulus, neutral-cure silicone rubber sealant for above-grade expansion and control joints of most building materials and for both new and remedial construction.

1.2 REFERENCES

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

1. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric Type Sealants by Means of a Durometer.

2. ASTM C679 - Standard Test Method for Tack-Free Time of Elastomeric Sealants.

3. ASTM C719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).

4. ASTM C794 - Standard Test Method for Tack-Free Time of Elastomeric Sealants.

5. ASTM C920 - Elastomeric Joint Sealants.

6. ASTM C1135 - Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants.

7. ASTM C1193 - Standard Guide for Use of Joint Sealants.

8. ASTM C1248 - Standard Test Method for Staining Porous Substrate by Joint Sealants.

9. ASTM C1330 - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

10. ASTM D412 - Standard Test Method for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.

11. ASTM D2202 - Standard Test Method for Slump of Sealants.

12. ASTM E119 (UL 263) - Standard Test Method for Fire Tests of Building Construction and Materials.

B. Government Services Administration (GSA), Commercial Item Descriptions (CID):

1. GSA CID A-A-272A - Sealing Compound: Silicone Rubber Base (For Caulking, Sealing, and Glazing in Buildings and Other Structures).

2. GSA CID A-A-1556 - Sealing Compound Elastomeric Type, Single Component (For Caulking, Sealing, and Glazing in Buildings and Other Structures).

1.3 SUBMITTALS

A. Provide in accordance with Section 01 33 00 - Submittal Procedures:

1. Product data for silicone sealant, primer, joint backing, and other accessories. Include material safety data sheets (MSDSs) and certifications showing compliance with specified standards.

2. Shop drawings detailing sealant joints and indicating joint dimensions, materials, sealant profile, and size limitations.

3. Manufacturer's color chart for selection by Architect.

4. Manufacturer's instructions for installation and field quality control testing.

5. Copy of warranties specified in Paragraph 1.5 for review by Architect.

1.4 PROJECT CONDITIONS

A. Do not install silicone sealant during inclement weather or when such conditions are expected. Allow wet surfaces to dry.

B. Do not install sealant when temperature is less than [5 degrees F] [3 degrees C] below dew point.

1.5 WARRANTY

A. Provide under provisions of Section 01 78 00 - Closeout Submittals:

1. Installer's 5-year workmanship warranty.

2. Manufacturer's 20-year material warranty for properly installed silicone sealant.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Dow Corning Corporation, P.O. Box 994, Midland, MI 48686-0994; (800) 248-2481; www.dowcorning.com/construction.

B. Requests to use equivalent products of other manufacturers shall be submitted in accordance with Section 01 63 00 - Product Substitution Procedures.

2.2 SEALANT

A. Type: One-component, ultra-low modulus, neutral-cure silicone rubber sealant; *Dow Corning*® 790 Silicone Building Sealant, as manufactured by Dow Corning Corporation.

B. Compliance: Sealant shall meet or exceed requirements of these standards:

1. ASTM C920, Type S, Grade NS, Class 100/50, Use T, NT, G, M, A, and O.

2. GSA CID A-A-272A.

3. GSA CID A-A-1556.

C. Color: To match stone cap at location designated in drawings

D. Shelf life: 12 months.

E. Application temperature range: [Minus 20 to plus 120 degrees F.] [Minus 29 to plus 50 degrees C.]

F. Tack-free time: 1 hour at 50 percent relative humidity, tested in accordance with ASTM C679.

G. Working time: 10 to 20 minutes.

H. Curing time at [3/8-inch] [10-mm] depth: 7 to 14 days at [77 degrees F] [25 degrees C] and 50 percent relative humidity.

I. Flow, sag, or slump in [3 inches] [76 mm] wide joint: None, when tested in accordance with ASTM D2202.

J. Volatile organic compound (VOC) content: 43 grams/liter maximum.

K. Cured sealant properties after 21 days at [77 degrees F] [25 degrees C] and 50 percent relative humidity.

1. Joint movement capability: Plus 100 percent extension and 50 percent compression, tested in accordance with ASTM C719.

2. Hardness: 15-durometer hardness, Shore A, tested in accordance with ASTM C661.

3. Properties tested in accordance with ASTM D412:

a. Ultimate tensile strength: [100 psi] [0.07 kg per square mm].

b. Ultimate elongation: 1,600 percent.

4. Minimum peel strength: [15 ppi] [2.67 kg/cm], tested in accordance with ASTM C794.

5. Properties, tested in accordance with ASTM C1135:

a. Adhesion at 25 percent extension: [15 psi.] [0.010 kg per square mm.]

b. Adhesion at 50 percent extension: [20 psi.] [0.015 kg per square mm.]

6. Weathering after 22,400 hours, tested in accordance with ASTM C1135 using QUV Weatherometer:

a. At 25 percent extension: [30 psi.] [0.020 kg per square mm.]

b. At 50 percent extension: [40 psi.] [0.028 kg per square mm.]

7. Staining after 14 days at 50 percent compression, [158 degrees F] [70 degrees C]: None on concrete, granite, limestone, and brick, when tested in accordance with ASTM C1248.

2.3 ACCESSORIES

A. Substrate primer: As recommended for project conditions and provided by silicone sealant manufacturer.

B. Sealant backing: Provide backing complying with ASTM C1330 [Type B non-absorbent, bi-cellular material with surface skin.] [Type O open-cell polyurethane.] [as recommended by sealant manufacturer.]

1. Size: Greater than joint opening by 25 percent minimum.

C. Bond breaker tape: Provide tape to prevent adhesion to joint fillers or joint surfaces at back of joint and allow sealant movement.

1. Type: Polyethylene or other plastic tape recommended by sealant manufacturer.

D. Masking tape: Non-staining, non-absorbent type compatible with silicone sealant and adjacent surfaces.

PART 3 – EXECUTION

3.1 GENERAL

A. Prepare substrates and apply silicone sealant in accordance with manufacturer's instructions.

B. Handle, store, and apply materials in compliance with applicable regulations and material safety data sheets (MSDSs).

C. Do not use silicone sealant for:

1. Below-grade applications.

2. Surfaces to be immersed in water for prolonged time.

3. Brass and copper surfaces.

4. Materials bleeding oils, plasticizers, and solvents.

5. Structural glazing and adhesive.

6. Surfaces to be painted.

7. Surfaces in direct contact with food.

8. Medical and pharmaceutical applications.

D. Do not apply in totally confined spaces without ventilation for curing.

3.2 PREPARATION

A. Inspect [existing joints to be repaired.] [new substrates to receive silicone sealant.] Ensure surfaces are clean, dry, and free of frost, dust, dirt, grease, oil, curing compounds, form release agents, laitance, efflorescence, mildew, and previous films and coatings.

B. Remove existing joint sealant materials. Clean joints and remove joint sealant residue. Repair deteriorated or damaged substrates as recommended by silicone sealant manufacturer to provide suitable substrate. Allow patching materials to cure.

C. Clean substrates to receive silicone sealant.

1. Porous surfaces: Abrasive-clean followed by blasting with oil-free compressed air.

2. Nonporous surfaces: Use two-cloth solvent wipe in accordance with ASTM C1193.

3. High-pressure water cleaning: Exercise care that water does not enter through failed joints.

D. Adhesion test: Apply silicone sealant to small area and perform adhesion test in accordance with ASTM C1193, Method A, to determine if primer is required to achieve adequate adhesion. If necessary, apply primer at rate and in accordance with manufacturer's instructions. Allow primer to dry.

E. Masking: Apply masking tape as required to protect adjacent surfaces and to ensure straight bead line and facilitate cleaning.

3.3 APPLICATION

A. Sealant backing: Install without gaps, twisting, stretching, or puncturing backing material. Use gage to ensure uniform depth to achieve correct profile, coverage, and performance.

B. Bond breaker: Install on backside of joint where backing is not feasible.

C. Sealant:

1. Use sealant-dispensing equipment to push sealant bead into opening. Fill joint opening to full and proper configuration. Apply in continuous operation.

2. Before skinning or curing begins, tool sealant with metal spatula. Provide concave, smooth, uniform, sealant finish. Eliminate air pockets and ensure complete contact on both sides of joint opening. Tool joints in one continuous stroke.

D. Complete horizontal joints prior to vertical joints. Lap vertical sealant over horizontal joints.

E. Cleaning: Remove masking tape and excess sealant.

3.4 FIELD QUALITY CONTROL

A. Perform adhesion tests in accordance with manufacturer's instructions and ASTM C1193, Method A, Field-Applied Sealant Joint Hand-Pull Tab.

1. Perform 5 tests for first linear foot of applied silicone sealant and 1 test for each 1 foot

seal thereafter or perform 1 test per floor per building elevation minimum.

2. For sealants applied between dissimilar materials, test both sides of joint.

B. Sealants failing adhesion test shall be removed, substrates cleaned, sealants re-installed, and re-testing performed.

C. Maintain test log and submit report to Architect indicating tests, locations, dates, results, and remedial actions.

END OF SECTION

PART 1 – GENERAL

1.1 SECTION REQUIREMENTS

A. Summary: Paint exposed exterior surfaces at repaired areas unless otherwise indicated.

1. Apply two coats of high-quality exterior paint to match existing color on all areas of repair.

B. Submittals:

1. Product Data: Include printout of "MPI Approved Products List" with product highlighted.

2. Samples: Submit draw downs of each existing color and obtain approval prior to start of painting

C. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."

2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

D. Mockups: Full-coat finish sample of each type of coating, color, and substrate, applied where directed.

E. Extra Materials: Deliver to Owner 5 gallons of each color and type of finish coat paint used on project, in containers, properly labeled and sealed.

PART 2 – PRODUCTS

1.2 PAINT

A. Products:

1. *Sherwin Williams* SuperPaint Exterior Acrylic Latex Paint.

B. Material Compatibility: Provide materials that are compatible with one another and with substrates.

1. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. Colors: As selected to match existing colors.

PART 3 – EXECUTION

1.3 PREPARATION

A. Remove hardware, lighting fixtures, and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.

B. Clean and prepare new or existing surfaces in an area before beginning painting in that area. Schedule painting so cleaning operations will not damage newly painted surfaces.

C. Caulk all sealant joints and remove sealant at joints that are required to be opened as required by the drawings and specifications.

1.4 APPLICATION

A. Apply paints according to manufacturer's written instructions.

1. Use brushes for exterior painting of wood trim.

2. Use rollers for finish coat on interior walls and ceilings for touch up work required by indirect damage from the exterior work.

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

1. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

C. Apply stains and transparent finishes to produce surface films without color irregularity, cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other imperfections. Use multiple coats to produce a smooth surface film of even luster.

1.5 EXTERIOR PAINT APPLICATION SCHEDULE

A. Doors and Louvers:

1. Match Existing: Two coats over pre-primed material:

B. Metal Flashings:

1. Match Existing: Two coats over pre-primed material:

END OF SECTION