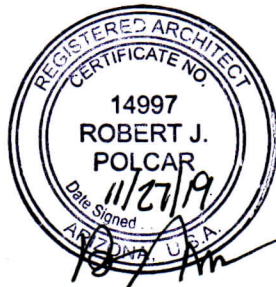


# ELOY ELEMENTARY SCHOOL DISTRICT

CURIEL PRIMARY SCHOOL  
WEATHERIZATION

NOVEMBER, 2019

SFB Project 110411103-9999-008 BRG



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1. PROJECT SITE

1.1 The School is located at 1000 North Curiel Street, Eloy, Arizona 85131.

2. SCOPE OF THE WORK

2.1 The Project involves work at the following buildings on the Curiel School Campus: All permanent classroom buildings (Buildings A, B, C and D) the Cafeteria Building (Building F), the Gymnasium Building (Building G) the Administration Building (Building H) and the steel canopy structures between. Portable buildings and "Old Cafeteria" are excluded.

Clean all exterior surfaces, including concrete, masonry, metal, gypsum board, wood fascia, metal fascia and low slope roofs.

Remove all building sealants including those at all expansion and construction joints, window and door frames, sheet metal and flashing joints, penetrations and any other sealants where they occur. Clean and repair joints and cracks, apply new backer rod and sealant.

Excavate top three inches of soil where adjacent to walls at all buildings for application of coating to walls. Regrade for positive drainage after application and cure of coating. Regrade swale on East side of Administration Building for positive drainage.

For the east canopy renovation, cut back the roof eaves at the south east corners of classroom buildings A, B and C to separate the canopy from eave framing. Close new building eave edges with steel channels and/ or formed sheet metal to match existing eave edges. Maintain the canopy framing connections to the building walls. Install new framing as needed to support canopy edge. Tear off existing roof of canopy, repair deck as required and install new membrane roof system and roof blocks on existing roof deck. At building D, build a new enclosure beneath the east eave and extend the canopy roofing membrane onto the enclosure and roof slope for tie-in with shingles.

For the central canopy renovation, tear off existing roof to deck, repair deck as required and install new membrane roof system. Tie-in to existing shingles, include tapered rigid insulation cricket to eliminate ponding condition on canopy.

Remove existing wood security paneling at all exterior building walls.

Remove steel sash window systems from openings in the north walls of classroom buildings A, B and C. Infill the openings with metal stud framing, batt insulation in the stud cavity, EIFS at exterior face and gypsum wall board on the interior face. Provide new aluminum framed insulated storefront windows at select locations.

Existing steel sash windows at the south sides of buildings A, B and C will remain. Remove wood siding, where occurs. Clean, repair, install new weather strip at operable parts, seal joints at head, sill and jamb. Paint.

Existing steel sash windows at the north and south sides of building D will remain. Clean, repair and re-glaze the bottom lites in all window openings. Re-glaze 10 additional lites. Seal joints at head, sill and jamb. Paint.

Remove the existing exterior wood door and frame at the south side of building D. Replace with a new hollow metal door, frame and hardware.

Provide new vented soffit on south side of building D. Drill vent holes in existing wood blocking. Paint existing plywood soffit on north side of building D.

Repair, prepare, block fill and coat all concrete masonry surfaces of all buildings in the project.

Seal all perimeter building/ sidewalk joints.

Prepare and paint all steel, steel doors, steel frames, ferrous metal downspouts, metal trim, metal fascia and exposed flashings.

Prepare, repair, spot prime and paint all paintable horizontal surfaces such as exterior soffits, eaves and ceilings, Cafeteria Building not included.

Repair shingle roofs at all classroom buildings (buildings A, B, C, D) and the Administration Building (building H).

Cafeteria Building (Building F): Remove and replace all wood fascias. Prepare and stain all fascias, exposed wood framing and exposed wood roof deck.

Cafeteria Building (building F): Provide new attic ventilation. Install ridge vent with new shingle system, install round blocking vents at low side in existing wood truss blocking.

Steep slope roof areas of Cafeteria Building (building F): Remove all roof coverings to the wood substrate. Remove all metal trim and accessories. Inspect substrate and repair as required. Install new fiberglass reinforced shingle system, including new metal trim and accessories. Verify that mechanical curbs comply with roof shingle system warranty requirements and adjust or replace if necessary.

Low slope roof of Gymnasium Building: Remove existing roof coverings and flashings to the deck. Inspect deck and repair as needed and to assure positive drainage throughout the roof area. Install new single ply membrane roof system, including rigid board insulation. Verify that mechanical curbs comply with roof membrane warranty requirements and adjust if necessary. Remove and reinstall all downspouts, replace damaged with new to match existing. Lift mechanical units for proper termination of new roof system.

Re-grade and compact eroded soil at perimeter of building G. Include new fill beneath and adjacent to concrete stoops.

Remove and reinstall all building mounted signs for coating of exterior walls.

Appropriate trades person to modify or extend any mechanical, electrical, plumbing, CCTV, telephone, security screens, antennae, sound, or lighting facilities, etc. found to obstruct the work of this project.

The project will take place during the school year while the campus is occupied.

END OF SECTION 01 11 00

1. REQUIRED MEETINGS

1.1 Weekly Job Progress Meetings are to be held at the jobsite. Meetings are to review progress, schedule, answer requests for information and review pay application. Contractor shall be responsible for recording and distributing meeting minutes.

END OF SECTION 01 31 19

1 CONSTRUCTION PROGRESS SCHEDULE

1.1 At the pre-construction meeting the Contractor shall submit for review a detailed construction progress schedule showing the proposed dates of commencement and completion of each portion of the Work.

2 PRODUCT CERTIFICATE

2.1 Contractor shall submit notarized certificate indicating products intended for the Work, including product names and numbers, with statement indicating that products to be provided meet the minimum of the Contract Documents.

3 QUALIFICATION DATA

3.1 Letter written by product manufacturer for this project indicating manufacturer approval of Installer to apply specified products and provide specified warranty. Submit with bid.

4 PRODUCT TEST RESULTS

4.1 Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for elastomeric coating system, joint sealants and components of roofing systems.

5 REVIEWED SUBMITTALS

5.1 The General Contractor shall keep all reviewed submittals on site and they shall be accessible at all times through the duration of the project.

6 INSPECTION REPORTS

6.1 Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests provided, defective work observed, and corrective actions required and carried out.

7 CLOSEOUT SUBMITTALS

7.1 One complete hard copy and 2 complete copies electronically on CD

7.2 Maintenance Data, to include maintenance manuals.

7.3 Warranties, executed copies of approved warranty forms.

END OF SECTION 01 33 00

1. WORK SPECIFIED HEREIN

1.1 Throughout the Contract Documents reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics.

1.2 Reference to known standards within these Specifications shall mean and intend the latest edition or amendment published prior to date of these Specifications, unless specified otherwise, and to such portions of it that relate and apply directly to the material or installation called for on the Project.

1.3 Where materials or workmanship are required by these Contract Documents to meet or exceed the specifically named code or standard, it is the Contractor's responsibility to provide material and workmanship which meet or exceed the specifically named code or standard.

1.4 It is the Contractor's responsibility, when so required by the Contract Documents or by written request from the Architect, to deliver to the Architect all required proof that the materials or workmanship, or both, meet or exceed the requirements of the specifically named code or standard. Such proof shall be in the form requested in writing by the Architect, and generally will be required to be copies of a certified report of tests conducted by a testing agency approved for that purpose by the Architect.

1.5 In procuring all items used in this Work, it is the Contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this Work meet or exceed the specified requirements.

1.6 The Architect reserves the right to reject items incorporated into the Work which fail to meet the specified minimum requirements. The Architect further reserves the right, and without prejudice to other recourse the Architect may take, to accept non-complying items subject to an adjustment in the Contract Amount as approved by the Architect and Owner.

1.7 Applicable standards and their abbreviations listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturers Association
AGC	Associated General Contractors
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
AOSHA	Arizona Occupational Safety and Health Act
APA	American Plywood Association
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASTM	American Society for Testing and Materials
ASME	American Society for Mechanical Engineers
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWSC	American Welding Society Code
AWI	Architectural Woodwork Institute
BIA	Brick Institute of America

CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
IBC	International Building Code
ICBO	International Conference of Building Officials
MAG	Maricopa Association of Governments
NAAMM	National Association of Architectural Metal Manufacturers
NBFU	National Board of Fire Underwriters
NBHA	National Builders Hardware Association
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NMWIA	National Mineral Wool Insulation Association
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturer's Association
OSHA	Occupational Safety and Health Act
PCA	Portland Cement Association
PCI	Precast Concrete Institute
SDI	Steel Door Institute
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SSPC	Steel Structures Painting Council
UL	Underwriters' Laboratories, Inc.
UPC	Uniform Plumbing Code
USDA	United States Department of Agriculture
WCLA	West Coast Lumbermen's Association
WCLB	West Coast Lumber Bureau
WIC	Woodwork Institute of California
WPOA	Western Plumbing Officials Association
WWPA	Western Wood Products Association

END OF SECTION 01 42 19



CUTTING AND PATCHING

1 GENERAL

1.1 This Section outlines requirements for cutting and patching of existing as well as new work.

A. Structural Work: Do not cut-and-patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio. Submit proposal and request and obtain Architect's approval before proceeding with any cut-and-patch of structural work.

B. Visual/Quality Limitations: Do not cut-and-patch work exposed to view (exterior and interior) in a manner resulting in noticeable reduction of visual qualities and similar qualities, as judged by Architect.

1. Engage the original installer/fabricator, or (if not available) an acceptable equivalent entity to perform cutting and patching.

2. Refinish entire surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection. For an assembly, refinish the entire unit.

C. Limitation on Approvals: Architect's approval to proceed with cutting and patching does not waive right to later require removal/replacement of work found to be cut-and-patched in an unsatisfactory manner, as judged by the Architect.

D. Where not more specifically described in any of the various Sections of these Specifications, workmanship shall conform to all of the methods and operations of best standards and accepted practices of the trade or trades involved, and shall include all items of fabrication, construction, or installation regularly furnished or required for completion, (including any finish), and for successful operation as intended.

E. Work shall be executed by mechanics skilled and experienced in their respective trade, and shall have proper certification or other credentials where appropriate.

F. In every case, exercise extreme care in cutting operations, and perform such operations under adequate supervision. Openings shall be neatly cut and shall be kept as small as possible to avoid unnecessary damage. Careless and/or avoidable cutting damage, etc., will not be tolerated, and the Contractor will be held responsible for such avoidable or willful damage.

G. Replacing, patching and repairing of materials and surfaces cut or damaged in the execution of the Work shall be performed by experienced mechanics of the applicable trades involved. Such replacing, repairing or patching shall be done with the applicable materials, in such manner that surfaces so replaced, etc., will, upon completion of the Work, match the surrounding similar surfaces.

H. When completed, all parts shall have been durably and substantially built and shall present a neat, workmanlike appearance.

END OF SECTION 01 73 29

## 1 GENERAL

1.1 This Section outlines requirements for cleaning of the Project work. This Section is complementary to the General Conditions and Supplementary General Conditions and nothing herein shall be considered to waive any requirements of the General conditions or Supplementary General Conditions.

1.2 Requirements of Regulatory Agencies; Safety and Insurance Standards: Maintain project in accordance with the following safety and insurance standards: State Industrial Commission (of Arizona), OSHA.

1.3 Store volatile waste in covered metal containers, and remove from premises daily.

1.4 Pollution Control: conduct clean-up and disposal operations to comply with local ordinances and anti-pollution laws. Burning or burying of rubbish and waste material on the project site is not permitted. Disposal of volatile fluid waste (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer systems or into streams or waterways is not permitted.

## 2 PRODUCTS

2.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

## 3 EXECUTION

### 3.1 CLEANING

#### 3.1.1. During Construction:

- A. During the construction period, the material to be used in the work shall be kept in an orderly manner, neatly stacked or piled.
- B. Clean up frequently (at least daily) all refuse, rubbish, scrap materials, and debris caused by operations, to the end that at all time the site of the Work shall present a neat, orderly and workmanlike appearance. Sprinkle dusty debris with water.
- C. Provide for the disposal of all waste products, trash, debris, etc., and make necessary arrangements for legal disposal of same off the site. Never throw rubbish from windows or other parts of building. Lower waste materials in a controlled manner with as few handlings as possible.
- D. Remove all surplus material, false-work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from operations, and put the site in a neat, orderly condition.
- E. Vacuum clean building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for acceptance.
- F. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
- G. Contractor shall provide trash gondolas or containers for use by all trades.

#### 3.1.2. Final Cleaning:

- A. Use experienced workmen or professional cleaners for final cleaning.
- B. Besides general broom cleaning, the following special cleaning for all trades shall be done at completion of work:

- a. Remove putty stains from glass; wash, polish same, inside and outside. Exercise care not to scratch glass.
- ~~b. Clean, polish and wax woodwork.~~
- c. Clean and polish hardware for removal of stains, dust, dirt, paint and the like.
- d. Remove spots, soil, paint from tile and similar work; wash same.
- e. Clean fixtures, equipment; remove stains, paint, dirt and dust.
- f. Remove temporary floor protections.
- ~~g. Clean and polish all floors.~~
- h. Remove all temporary protections at the site.
- i. Clean exterior and interior metal surfaces, including doors and windows, of oil, stains, dust, dirt, paint and the like.
- ~~j. Clean and vacuum all carpeted areas.~~
- C. Make buildings ready for occupancy in all respects. Lay heavy building paper in main circulation areas to protect the floors until final inspection and acceptance.
- D. All existing improvements inside or outside the property, which are disturbed, damaged or destroyed by the work under the Contract, shall be restored to the condition in which they originally were, or to the satisfaction of the Architect.

END OF SECTION 01 74 00

## PROJECT RECORD DOCUMENTS

## 1.1 RECORD DRAWINGS

- A. The Contractor shall maintain on site a set of the contract drawings showing all changes or modifications to the project during construction. At project substantial completion the contractor will provide the Architect with a complete record set of the original Construction Documents for review. Construction Change Directive and Change Order items shall be included and clearly indicated. The following shall be provided on the Drawings, as follows:
1. Any changes from the Contract Documents, secured with prior approval of the Architect, for any phase of the Work, including all Addenda, Construction Change Directives and Change Orders shall be recorded in a neat readable manner, on the record drawings. All changes from the documents originally bid shall be made by a competent drafter and "clouded". All deletions shall be made by strike-through and clouded.
  2. For plumbing; heating, ventilating and air conditioning; electrical; and fire protection Work, Record Drawings shall be maintained by the Contractor as the Work progresses and as follows:
    - a. Deviations from the sizes, locations, and from other features of installations shown in the Contract Documents shall be recorded. Shut-off valves and other controls shall be clearly marked.
    - b. In addition, it shall be possible, using these drawings, to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as other features of the Work which will be concealed underground and/or in the finished building.
  3. Locations of underground Work shall be established by dimensions to column lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.
    - a. For Work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others it may be sufficient to illustrate the Work on the drawings in relation to the spaces in the building near which it was actually installed. Architect's decision in this matter shall be final.
  4. Additional drawings shall be provided as necessary for clarification.
  5. Drawings shall be kept up-to-date during the entire course of the Work and shall be available upon request for examination by the Architect and, when necessary, to establish clearances for other parts of the Work.
  6. Upon substantial completion of the Work, submit one (1) copy of the Record Drawings to the Architect for review. The Architect may request additional information be included as part of the record drawing set prior to approval. The Architect shall review the Record Drawings and shall be the sole judge of the acceptability of these drawings.

## 1.2. OWNER'S MANUAL

Upon Substantial Completion of the Project Work, submit one (1) copy of the Owner's Manual suitably typed, indexed and labeled for ready reference to the Architect for review.

- A. Subcontractors, major suppliers list with company's names, addresses and telephone numbers.
- B. Guarantees/warranties, certifications as described in the General Conditions, Supplementary General conditions and/or the technical specification or each item or work product.
- C. Affidavit: Non-Use of Asbestos Containing Building Materials from General Contractor on use of asbestos free materials, included in this Section.
- D. Materials Receipt signed by Owner and Contractor, included in this Section
- E. Special certifications and inspections documentation.

- F. ~~Certification of building pad and finish floor elevations by a licensed surveyor.~~
- G. Training Log
- H. Other items required by the Specifications.

Upon acceptance of Owner's Manual document, the Contractor shall provide one (1) final hard copy and two (2) copies electronically on CDs to Architect for transmittal to the owner.

### 1.3 OPERATION AND MAINTENANCE DATA

- A. Upon Substantial Completion of the Project Work, submit one (1) copy of the Operation and Maintenance Manual and Operating Instructions including parts lists for materials, equipment and systems, electrical and control items, to the Architect for review and possible approval. Division 21 to 28 shall be contained in separate binders for each division. Unless approved, revise the Operation and Maintenance Manuals in strict accordance with the Architect's comments. Resubmit one (1) copy of the Operation and Maintenance Manual to the Architect for final review. Upon receipt of Notice of Approval, deliver one (1) hard copy and two (2) copies electronically on CDs of the Operation and Maintenance Manuals to the Architect who will transmit them to the Owner. NOTE: Failure to properly complete and submit Maintenance and Operation Manuals in a timely manner shall place responsibility for detrimental maintenance and operating procedures on the Contractor.
- B. Operating instructions shall include complete operating sequence, control diagrams, description of method of operating machinery, machine serial numbers, factory order numbers, parts, tests, instruction books, suppliers' phone numbers and addresses and individual equipment guarantees. Parts lists shall be complete in every respect, showing parts and part numbers for ready reference.
- C. Maintenance instructions shall include a written list of required and suggested maintenance for mechanical, plumbing, electrical or other equipment or features in the project. Each item shall contain a brief description of the maintenance required as well as the recommended time frame or period for the maintenance. Include lists of filter sizes for air handling equipment, indicated "washable" or "disposable" and for which unit the filter is for. Shut off valves, etc., must be clearly marked on as-constructed drawings.
- D. Assemble maintenance manual and operating instructions in hard back loose leaf binders. Suitably label and index material for ready reference.

### 1.4 CERTIFICATES AND AFFIDAVIT

- A. Certificates: Submit certificates from governing authorities, manufacturers and subcontractors not previously submitted at the time of Substantial Completion.
- B. Affidavit: Submit the completed "Non-Use of Asbestos Containing Building Materials".

END OF SECTION 01 77 00

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Vertical Ladders.

1.2 SUBMITTALS

- A. Submit under provisions of Section 01300
- B. Product Data: Manufacturer's data sheets indicating materials of construction.
- C. Shop Drawings: Drawings prepared for this specific project, showing ladder configuration, dimensions, location and method of anchorage.

1.3 REFERENCES

- A. American National Standards Institute (ANSI)
  - 1. ANSI A14.3 – Ladders, Fixed, Safety Requirements.
- B. American Society for Testing and Materials (ASTM) Publications:
  - 1. ASTM B209 – Aluminum-Alloy Sheet and Plate.
  - 2. ASTM B221 – Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.

1.4 QUALITY ASSURANCE

- A. Access ladders shall be designed and installed to comply with ANSI A14.3 and OSHA 1910.27.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with the requirements, provide aluminum vertical roof ladder, Sure Step model with security door and bottom wall mount bracket, by Royalite Manufacturing Inc., or comparable product by one of the following:
  - 1. Precision Ladders, LLC.
  - 2. Upnover, Inc.
  - 3. Pre-Approved Equal.
- B. Comply with "Request for Approved Equal" in the "Special Terms and Conditions of the IFB".

2.2 COMPONENTS

- A. Ladders: Provide ladders that comply with OSHA and local building codes, with all edges rounded, clean and smooth burr free, dimensions as indicated in drawings.
- B. Ladder Treads: Extruded aluminum, 6063-T5 alloy, with self cleaning serrated top surface with rounded front and back edges. They are fastened to rails with concealed stainless steel screws capable of withstanding and exceeding all OSHA load requirements per tread without damage. Rung cross section for vertical ladders is minimum 2 inches horizontal and 1 nominal inch vertical.
- C. Vertical Ladder Rails (supporting treads): Custom extruded aluminum, 6063-T5 alloy, with rounded corners, approximately 4 inches deep; mounted so that the center line of the tread is minimum 7 inches from face of wall. Wall brackets are bent aluminum strap 2 inches wide by 3/16 inch thick. Base brackets are 2"x2"x2" x 1/8" aluminum angles. Bottom Wall Mount brackets include an additional diagonal angle brace of the same material.
- D. Extended Rails: Aluminum tubing 0.875 inches diameter is formed with two parallel tubes for each length of rail with radius corners assembled with stainless steel fasteners.
  - 1. Walk through hand rails: At top of ladders leading to roofs or landings hand rails extend a minimum 42 inches vertically above the top of the parapet or landing and project a minimum of 10 inches past the edge of the roof or landing.
- E. Landing or Rest Platforms: Typically constructed of 2 inch by 1 inch ladder treads placed flush adjacent to each other to form desired typical platform size. Custom sizes or other decking materials are available when required.
- F. Anchor Bolts: Hot-dipped galvanized or stainless steel bolts. Diameter as specified by the ladder manufacturer. Fastener length as required to provide adequate anchorage to substrate provided by project contractor as determined by the project engineer.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Installation to be in accordance with the manufacturer's printed instructions.
- B. Anchor securely using fasteners recommended by the manufacturer or other of equivalent or greater strength at locations specified and into substrate.

END OF SECTION 05 51 33.13

## PART 1 - GENERAL

## 1.1 SUMMARY:

- A. All labor, materials, equipment and services necessary to furnish and install carpentry and related items as indicated or specified.
- C. Provide wood, nails, bolts, screws, framing anchors, rough hardware, and other items needed to perform carpentry for the construction shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Provide wood for support or attachment of other work such as cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members. Provide lumber of the sizes shown or specified, worked to shapes shown and as specified.

## 1.2 RELATED SECTIONS

- A. Section 09 91 00 – Painting
- B. Section 09 93 00 – Stains and Transparent Finishes

## 1.3 DELIVERY, HANDLING AND STORAGE

- A. Carefully store all lumber delivered to the site off the ground in a manner to assure proper drainage, ventilation and protection from the weather.
- B. Keep carpentry materials dry during delivery. Store lumber and plywood in stacks. Protect bottom of stacks against contact with damp or wet surfaces. Protect exposed materials against weather.
- C. Do not store dressed or treated lumber or plywood outdoors.
- D. Deliver materials to job site in new, original and unopened containers bearing manufacturer's name, trade name and label analysis.
- E. Store materials for which a maximum moisture content is specified only in areas where relative humidity has been reduced to a level where specified moisture content can be maintained.
- F. Obtain measurements and verify dimensions shown and Shop Drawing detail before proceeding with carpentry work whenever possible.

## PART 2 PRODUCTS

## 2.1 GRADE STAMPS

- A. Identify lumber used for framing, nailers and blocking by the appropriate grade stamp.

## 2.2 MATERIALS

## A. Lumber

- 1. Moisture Content - 19% maximum for all lumber items not specified to receive wood preservatives treatment.
- 2. Grade - Construction grade light framing size lumber of any species or board size lumber, as required. Douglas Fir, provide No. 2 and better (WWPA).

## B. Plywood

- 1. Exterior plywood, exterior grade APA rated sheathing.

## C. Anchorage and Fastening Materials - Select proper type, size, material and finish for each application. Comply with the following:

- 1. Nails and Staples - FS FF-N-105.
- 2. Wood Screws - FS FF-S-111.
- 3. Bolts and Studs - FS FF-B-575.
- 4. Nuts - FS FF-N-836.
- 5. Washers - FS FF-W-92.
- 6. Lag Screws or Lag Bolts - FS FF-B-561.
- 7. Expansion Shields, Expansion Nails and Drive Screw Devices - FS FF-B-561.



8. Toggle Bolts - FS FF-B-588.
9. Bar or Strap Anchors - ASTM A-525 zinc coated steel, 18 gauge minimum.

## PART 3 - EXECUTION

### 3.1 ACCEPTABLE INSTALLERS

- A. Employ only mechanics skilled in carpentry.

### 3.2 INSTALLATION

- A. Install rough carpentry work to comply with the provision in "The International Building Code" appropriate version, with recommendations of American Plywood Association (APA), "American Forest and Paper Associates (AFFPA), and "American Wood Council" (AWC) unless otherwise indicated. For other products not covered in above standards, comply with recommendations of manufacturer of product involved for use intended.
- B. Carefully select the members. Use only sound, thoroughly seasoned, well manufactured materials of the longest practical lengths and sizes to minimize jointing.
- C. Use materials free from warp which cannot be easily corrected by anchoring and attachment. Sort out and discard warped material and material with other defects which would impair the quality of the work. Lumber may be rejected by the Architect or Owner's Representative, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
- D. Securely attach carpentry work to substrates by anchoring and fastening as shown and as required by recognized standards. Provide washers under bolt heads and nuts in contact with wood.
- E. Set carpentry work accurately to required levels and lines with members plumb and true, and accurately cut and fit.
- F. Shim with metal or slate for full bearing on concrete or masonry substrates.
- G. Arrange for back priming of all concealed surfaces for materials scheduled to be painted under Section 09 91 00 as soon after delivery as possible.
- H. Install all work plumb, level, true to line and firmly secured to grounds or backing. Scribe and fit accurately to adjacent work, taking care not to injure finished surfaces.
- I. Distribute defects allowed in the quality grades specified to minimize their affect on the finished work. Fit joints tight, flush and even. Ease all sharp edges.
- J. Protect all work after erection, repairing or replacing damaged work as directed.
- K. Correlate location of furring, nailers, blocking, grounds and similar supports so that attached work will comply with design requirements.
- L. Fit carpentry work to other work. Scribe and cope as required for accurate fit.
- M. Time delivery and installation of carpentry work to avoid delaying other trades whose work is dependent on or affected by the carpentry work and to comply with protection and storage requirements.
- N. Examine all parts of the supporting structure and the conditions under which the carpentry work is to be installed, and notify the Architect in writing of any conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions are corrected.
- O. Attachment and Anchorage
  1. Use common wire nails, except as otherwise shown or specified herein. Do not wax or lubricate fasteners that depend on friction for holding power. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials.
  2. Make tight connections between members. Install fasteners without splitting wood; predrill as required. Do not drive threaded friction type fasteners; turn into place. Tighten bolts and lag screws at installation and retighten as required for tight connections prior to closing in or at completion of work.
- P. Wood, Nailers and Blocking
  1. Provide wherever shown and where required for screening or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached.

2. Coordinate location with other work involved. Refer to Shop Drawings of such work.
3. Attach to substrates securely with anchor bolts and other attachment devices as shown and as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown.
4. Set true to line and level, plumb, with intersections true to required angle. Build into masonry as work progresses, cutting to fit masonry unit size involved. Anchor to formwork before concrete placement.

Q. Fastening

1. Fasteners: All nails, screws, bolts, and nuts that are used to fasten lumber shall be non-corrosive, stainless steel or equivalent.
2. Attach all work to assure firm, secure support, with all fastenings concealed. Blind nail where possible; where not possible, locate, drive and set surface nails for putty stopping so as not to be conspicuous in the finish. Surface nail plain casings, base, etc. in pairs at 24" centers. Drill lead holes for all screws. Apply adhesives in strict accordance with manufacturer's directions, supplementing adhesives with nailing as required.

R. Trim, Etc.

1. Install standing trim in widths and depths as noted on drawings and in single lengths without splices, running trim in lengths as long as possible, joined only where solid fastenings can be made. End joints in built-up members shall be well distributed. Miter external corners, cope internal corners.

END OF SECTION 06 10 00

PART I GENERAL

1.1 SUMMARY

- A. This basis of design for this specification is Dryvit Outsulation Plus MD System. For complete product description and usage refer to:
  - 1. Dryvit Outsulation Plus MD System Data Sheet, DS445
  - 2. Dryvit Outsulation Plus MD System Application Instructions, DS218
  - 3. Dryvit Outsulation Plus MD System Installation Details, DS110
- B. Related Sections
  - 1. Unit Masonry – Section 04 22 00
  - 2. Rough Carpentry – Section 06 10 00
  - 3. Water-Resistive Barriers – Section 07 25 00

1.2 REFERENCES

- A. ASTM E 1397
- B. ASTM E 2273
- C. ASTM E 2511-17
- D. ASTM E 2568
- E. ASTM E 2570

1.3 DEFINITIONS

- A. Base Coat: Material used to encapsulate one or more layers of reinforcing mesh fully embedded that is applied to the outside surface of the EPS.
- B. Building Expansion Joint: A joint through the entire building structure designed to accommodate structural movement.
- C. Contractor: The contractor that installs the Exterior Insulation and Finish System to the substrate.
- D. Expansion Joint: A structural discontinuity in the Exterior Insulation and Finish System.
- E. Finish: An acrylic-based coating, available in a variety of textures and colors that is applied over the base coat.
- F. Insulation Board: Expanded polystyrene (EPS) insulation board, which is affixed to the substrate and creates a layer of continuous insulation.
- G. Reinforcing Mesh: Glass fiber mesh(es) used to reinforce the base coat and to provide impact resistance.
- H. Sheathing: A substrate in sheet form.
- I. Substrate: The material to which the Exterior Insulation and Finish System is affixed.
- J. Substrate System: The total wall assembly including the attached substrate to which the Exterior Insulation and Finish System is affixed.

1.4 SYSTEM DESCRIPTION

- A. General: An Exterior Insulation and Finish System (EIFS) with drainage, Class PB, consisting of an air/water-resistive barrier, an adhesive, expanded polystyrene insulation board, base coat, reinforcing mesh(es) and finish.
- B. Method of Installation:
  - 1. Field Applied: The Exterior Insulation and Finish System is applied to the substrate system in place.
- C. Design Requirements:
  - 1. Acceptable substrates for the Exterior Insulation and Finish System shall be:

- a. Exterior (non-structural) sheathing having a water-resistant core with fiberglass mat facers meeting ASTM C 1177.
  - b. For structural locations as delineated on plans APA Exterior or Exposure 1 Rated Plywood, Grade C-D or better, nominal 1/2 in, minimum, installed with the C face out.
  - c. For structural locations as delineated on plans APA Exposure 1 Rated Oriented Strand Board (OSB) nominal 1/2 in, minimum. **Note: Applications over OSB sheathing requires a minimum of 2 coats of Backstop NT – Smooth or Spray. Backstop NT – Texture is not recommended for the field of wall application over OSB.**
2. Deflection of the substrate systems shall not exceed 1/240 times the span.
  3. The substrate shall be flat within 1/4 in in a 4 ft radius.
  4. The slope of inclined surfaces shall not be less than 6:12 (27°) and the length shall not exceed 12 in.
  5. All areas requiring an impact resistance classification higher than "standard", as defined by ASTM E 2486 (formerly EIMA Standard 101.86), shall be as detailed in the drawings and described in the contract documents.
  6. Expansion Joints:
    - a. Design and location of expansion joints in the Exterior Insulation and Finish System is the responsibility of the project designer and shall be noted on the project drawings. As a minimum, expansion joints shall be placed at the following locations:
      - 1) Where expansion joints occur in the substrate system.
      - 2) Where building expansion joints occur.
      - 3) At floor lines in wood frame construction.
      - 4) At floor lines of non-wood framed buildings where significant movement is expected.
      - 5) Where the Exterior Insulation and Finish System abuts dissimilar materials.
      - 6) Where the substrate type changes.
      - 7) In continuous elevations at intervals not exceeding 75 ft.
      - 8) Where significant structural movement occurs, such as changes in roof line, building shape or structural system.
  7. Terminations:
    - a. Prior to applying the Exterior Insulation and Finish System, wall openings shall be treated with the EIFS manufacturer's flashing system or Flashing Tape. Refer to EIFS Manufacturer's Installation Details.
    - b. The Exterior Insulation and Finish System shall be held back from adjoining materials around openings and penetrations such as windows, doors, and mechanical equipment a minimum of 3/4 in for sealant application. See Exterior Insulation and Finish System Manufacturer's Installation Details.
    - c. The system shall be terminated a minimum of 8 in above finished grade.
    - d. Sealants
      - 1) Shall be manufactured and supplied by others.
      - 2) Shall be compatible with the Exterior Insulation and Finish System materials. Refer to current Exterior Insulation and Finish System Manufacturers' publications for listing of sealants tested by sealant manufacturer for compatibility.
      - 3) The sealant backer rod shall be closed cell.
  8. Flashing: Shall be provided at all roof-wall intersections, windows, doors, chimneys, decks, balconies and other areas as necessary to prevent water from entering behind the Exterior Insulation and Finish System.
- D. Performance Requirements:
1. The Exterior Insulation and Finish System shall have been tested as follows:
    - a. Air/Water-Resistive Barrier Coating

TEST	TEST METHOD	CRITERIA	RESULTS
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<b>Tensile Bond</b>	ASTM C 297/E 2134*	Minimum 104 kPa (15 psi)	Substrate: Minimum 131 kPa (19 psi) (Backstop NT) Minimum 166 kPa (24.1 psi) (Backstop DMS)  Flashing Minimum 2970 kPa (431 psi) (Backstop NT) Minimum 967 kPa (140 psi) (Backstop DMS)
<b>Freeze-thaw</b>	ASTM E 2485 Method B*	No deleterious effects after 10 cycles	Passed - No deleterious effects after 10 cycles
<b>Water Resistance</b>	ASTM D 2247*	No deleterious effects after 14 days exposure <sup>1</sup>	No deleterious effects after 14 days exposure
<b>Water Vapor Transmission</b>	ASTM E 96 Proc. B*	Vapor Permeable	Backstop NT: 7 Perms <sup>2</sup> Backstop NT Spray: 7.9 Perms <sup>2</sup> Backstop DMS: 30 Perms
<b>Air Leakage</b>	ASTM E 283	No ICC or ANSI/EIMA Criteria	0.01 l/sec/m <sup>2</sup> (0.002 cfm/ft <sup>2</sup> ) (Backstop NT)
<b>Air Permeance</b>	ASTM E 2178	No ICC or ANSI/EIMA Criteria	0.0006 l/s/m <sup>2</sup> @ 75Pa (1.2x10 <sup>-4</sup> cfm/ft <sup>2</sup> @ 1.6 psf) (Backstop NT)
<b>Air Barrier Assembly</b>	ASTM E 2357	No ICC or ANSI/EIMA Criteria	0.05 l/sec m <sup>2</sup> @ 300 Pa (<0.001 cfm/ft <sup>2</sup> @ 6.24 psf) (Backstop NT)
<b>Nail Sealability</b>	ASTM D 1970	No ICC or ANSI/EIMA Criteria	Passed ABAA Criteria
<b>Structural Performance</b>	ASTM E 1233 Proc. A*	Minimum 10 positive cycles at 1/240 deflection; No cracking in field, at joints or interface with flashing	Passed
<b>Racking</b>	ASTM E 72*	No cracking in field, at joints or interface with flashing at net deflection of 3.2 mm (1/8 inch)	Passed
<b>Restrained Environmental</b>	ICC-ES Procedure*	5 cycles; No cracking in field, at joints or interface with flashing	Passed
<b>Water Penetration</b>	ASTM E 331*	No water penetration beyond the inner-most plane of the wall after 15 minutes at 137 Pa (2.86 psf)	Passed
<b>Weathering UV Exposure</b>	ASTM D 2898 Method B*	210 hours of exposure	Passed

<b>Accelerated Aging</b>	ICC-ES	25 cycles of wetting and drying	Passed
<b>Hydrostatic Pressure Test</b>	Procedure* AATCC 127*	ICC: 549 mm (21.6 in) water column for 5 hours	Passed
<b>Surface Burning Characteristics</b>	ASTM E 84	Flame Spread < 25 Smoke Developed < 450	Passed
<p>* ASTM E 2570 Standard Test Method for Evaluating Water-Resistive Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage, also referred to as AC212 – Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing</p> <p>1. No cracking, checking, rusting, crazing, erosion, blistering, peeling, or delamination when viewed under 5x magnification</p> <p>2. Defined as a Class III vapor retarder per the 2009 IBC and IRC</p>			

b. Durability

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Abrasion Resistance</b>	ASTM D 968	No deleterious effects after 500 liters (528 quarts)	No deleterious effects after 1000 liters(1056 quarts)
<b>Accelerated Weathering</b>	ASTM G 155 Cycle 1*	No deleterious effects after 2000 hours	No deleterious effects after 5000 hours
	ASTM G 154 Cycle 1* (QUV)		No deleterious effects after 5000 hours
<b>Freeze-Thaw</b>	ASTM E 2485 Method A*	No deleterious effects after 60 cycles	Passed - No deleterious effects after 90 cycles
	ASTM C 67 modified	No deleterious effects after 60 cycles	Passed - No deleterious effects after 60 cycles
	ASTM E 2485 Method B*	No deleterious effects after 10 cycles	Passed - No deleterious effects after 10 cycles
<b>Mildew Resistance</b>	ASTM D 3273	No growth during 28 day exposure period	No growth during 60 day exposure period
<b>Water Resistance</b>	ASTM D 2247*	No deleterious effects after 14 days exposure	No deleterious effects after 42 days exposure
<b>Taber Abrasion</b>	ASTM D 4060	N/A	Passed 1000 cycles
<b>Salt Spray Resistance</b>	ASTM B 117*	No deleterious effects after 300 hours exposure	No deleterious effects after 1000 hours exposure
<b>Water Penetration</b>	ASTM E 331*	No water penetration beyond the inner-most plane of the wall after 15 minutes at 137 Pa (2.86 psf)	Passed 15 minutes at 137 Pa (2.86 psf)
<b>Water Vapor Transmission</b>	ASTM E 96 Procedure B*	Vapor permeable	EPS Coat <sup>1</sup> 5 perm-inch Base Finish <sup>2</sup> 40 Perms 40
<b>Drainage Efficiency</b>	ASTM E 2273	Minimum Drainage Efficiency of 90%	Passed

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems, also referred to as AC235 – Acceptance Criteria for EIFS Clad Drainage Wall Assemblies  
 1. Base Coat perm value based on Dryvit Genesis®  
 2. Finish perm value based on Dryvit Quarzputz

c. Structural

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Tensile Bond</b>	ASTM C 297/E 2134*	Minimum 104 kPa (15 psi) – substrate or insulation failure	Minimum 213.6 kPa (31 psi)
<b>Transverse Wind Load</b>	ASTM E 330*	Withstand positive and negative wind loads as specified by the building code	Minimum 4.3 kPa (90 psf) <sup>1</sup> 16 inch o.c. framing, ½ in sheathing screw attached at 203 mm (8 inch) o.c.

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.  
 1. All Dryvit components remain intact – for higher wind loads contact Dryvit Systems, Inc.

d. Impact Resistance: In accordance with ASTM E 2486\* (formerly EIMA Standard 101.86):

Reinforcing Mesh <sup>1</sup> /Weight g/m <sup>2</sup> (oz/yd <sup>2</sup> )	Minimum Tensile Strengths	EIMA Impact Classification	EIMA Impact Range Joules (in-lbs)		Impact Test Results Joules (in-lbs)	
<b>Standard - 146 (4.3)</b>	27 g/cm (150 lbs/in)	Standard	3-6	(25-49)	4	(36)
<b>Standard Plus - 203 (6)</b>	36 g/cm (200 lbs/in).	Medium	6-10	(50-89)	6	(56)
<b>Intermediate - 407 (12)</b>	54 g/cm (300 lbs/in).	High	10-17	(90-150)	12	(108)
<b>Panzer® 15<sup>2</sup> - 509 (15)</b>	71 g/cm (400 lbs/in).	Ultra High	>17	(>150)	18	(162)
<b>Panzer 20<sup>2</sup> - 695 (20.5)</b>	98 g/cm (550 lbs/in).	Ultra High	>17	(>150)	40	(352)
<b>Detail Mesh □□□ Short Rolls - 146 (4.3)</b>	27 g/cm (150 lbs/in).	n/a	n/a	n/a	n/a	n/a
<b>Corner Mesh™ - 244 (7.2)</b>	49 g/cm (274 lbs/in).	n/a	n/a	n/a	n/a	n/a

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.  
 1. It shall be colored blue for product identification bearing the Dryvit logo.  
 2. Shall be used in conjunction with Standard Mesh (recommended for areas exposed to high traffic).

e. Fire Resistance:

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Fire Resistance</b>	ASTM E 119	No effect on the fire resistance of a rated wall assembly	Passed 1 hour

<b>Ignitability</b>	NFPA 268*	No ignition at 12.5 kw/m <sup>2</sup> at 20 minutes	Passed
<b>Intermediate Multi-Story Fire Test</b>	NFPA 285* (UBC 26-9)	<ol style="list-style-type: none"> <li>1. Resist flame propagation over the exterior surface</li> <li>2. Resist vertical spread of flame within combustible core/component of panel from one story to the next</li> <li>3. Resist vertical spread of flame over the interior surface from one story to the next</li> <li>4. Resist lateral spread of flame from the compartment of fire origin to adjacent spaces</li> </ol>	Passed
<b>Full Scale Multi-Story (corner test)</b>	ANSI FM 4880	Resist flame propagation over the exterior surface	Passed; No height restrictions*

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.  
1. Dryvit FM Products must be specified

2. The Exterior Insulation and Finish System components shall be tested for:  
a. Fire

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Surface Burning Characteristics</b>	ASTM E 84*	All components shall have a: Flame Spread $\leq$ 25 Smoke Developed < 450	Passed

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.

- b. Durability

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Reinforcing Mesh Alkali Resistance of Reinforcing Mesh</b>	ASTM E 2098*	> 21dN/cm (120 pli) retained tensile strength after exposure	Passed
<b>EPS (Physical Properties) Density</b>	ASTM C 303, D 1622	15.2-20.0 kg/m <sup>3</sup> (0.95-1.25 lb/ft <sup>3</sup> )	Passed
<b>Thermal Resistance</b>	ASTM C 177, C 518	4.0 @ 4.4 °C (40 °F) 3.6 @ 23.9 °C (75 °F)	Passed Passed
<b>Water Absorption</b>	ASTM C 272	2.5 % max. by volume	Passed
<b>Oxygen Index</b>	ASTM D 2863	24% min. by volume	Passed
<b>Compressive Strength</b>	ASTM D 1621 Proc. A	69 kPa (10 psi) min.	Passed
<b>Flexural Strength</b>	ASTM C 203	172 kPa (25 psi) min.	Passed
<b>Flame Spread Smoke Developed</b>	ASTM E 84* ASTM E 84*	25 max. 450 max.	Passed Passed

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.



## 1.5 SUBMITTALS

- A. Product Data: The contractor shall submit to the owner/architect the manufacturer's product data sheets describing products, which will be used on this project.
- B. Samples: The contractor shall submit to the owner/architect two (2) samples of the Exterior Insulation and Finish System for each finish, texture and color to be used on the project. The same tools and techniques proposed for the actual installation shall be used. Samples shall be of sufficient size to accurately represent each color and texture being utilized on the project.
- C. Test Reports: When requested, the contractor shall submit to the owner/architect copies of selected test reports verifying the performance of the Exterior Insulation and Finish System.

## 1.6 QUALITY ASSURANCE

### A. Qualifications

#### 1. Manufacturer:

- a. Materials shall be manufactured at a facility covered by a current ISO 9001:2008 and ISO 14001:2004 certification. Certification of the facility shall be done by a registrar accredited by the American National Standards Institute, Registrar Accreditation Board (ANSI-RAB).
- 2. Contractor: Shall be knowledgeable in the proper installation of the Dryvit Outsulation Plus MD System or the pre-approved equal System and shall be experienced and competent in the installation of Exterior Insulation and Finish Systems. Additionally, the contractor shall possess a current Certificate of Training issued by the EIFS Manufacturer.
- 3. Insulation Board Manufacturer: Shall be listed by the EIFS Manufacturer, shall be capable of producing the Expanded Polystyrene (EPS) in accordance with the current EIFS Manufacturer's Specification for Insulation Board, and shall subscribe to the Manufacturer's Third Party Certification and Quality Assurance Program.

### B. Regulatory Requirements:

- 1. The EPS shall be separated from the interior of the building by a minimum 15-minute thermal barrier.
- 2. The use and maximum thickness of EPS shall be in accordance with the applicable building code(s).

### C. Certification

- 1. The Exterior Insulation Finish System shall be recognized for the intended use by the applicable building code(s).

### D. Mock-Up

- 1. The contractor shall, before the project commences, provide the owner/architect with a mock-up for approval.
- 2. The mock-up shall be of suitable size as required to accurately represent the products being installed, as well as each color and texture to be utilized on the project.
- 3. The mock-up shall be prepared with the same products, tools, equipment and techniques required for the actual applications. The finish used shall be from the same batch that is being used on the project.
- 4. The approved mock-up shall be available and maintained at the jobsite.
- 5. For panelized construction, the mock-up shall be available and maintained at the panel fabrication location.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered to the job site in the original, unopened packages with labels intact.
- B. Upon arrival, materials shall be inspected for physical damage, freezing or overheating. Questionable materials shall not be used.
  - 1. Materials shall be stored at the job site, and at all times, in a cool, dry location, out of direct sunlight, protected from weather and other sources of damage. Minimum storage temperature shall be as follows:
    - a. DPR Finish: 4 °C (40 °F).
    - b. For other products, refer to specific product data sheets.

2. Maximum storage temperature shall not exceed 38 °C (100 °F). **NOTE: Minimize exposure of materials to temperatures over 32 °C (90 °F). Finishes exposed to temperatures over 43 °C (110 °F) for even short periods may exhibit skinning, increased viscosity and should be inspected prior to use.**

C. Protect all products from inclement weather and direct sunlight.

## 1.8 PROJECT CONDITIONS

### A. Environmental Requirements

1. Application of wet materials shall not take place during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are completely dry.
2. At the time of EIFS product application, the air and wall surface temperatures shall be from 4 °C (40 °F) minimum to 38 °C (100 °F) maximum for the following products:
  - a. DPR Finish.
  - b. For other products, refer to specific product data sheets.
3. These temperatures shall be maintained with adequate air ventilation and circulation for a minimum of 24 hours. Refer to published product data sheets for more specific information.

## 1.9 SEQUENCING AND SCHEDULING

- A. Installation of the Exterior Insulation Finish System shall be coordinated with other construction trades.
- B. Sufficient manpower and equipment shall be employed to ensure a continuous operation, free of cold joints, scaffold lines, texture variations, etc.

## 1.10 WARRANTY

- A. The EIFS Manufacturer shall provide a written moisture drainage and limited materials 10 year warranty against defective material.
- B. The applicator shall warrant workmanship separately.

## 1.11 MAINTENANCE

- A. Maintenance and repair shall follow the procedures noted in the EIFS Manufacturer's Application Instructions.
- B. EIFS Manufacturer to provide to the Owner maintenance instructions regarding cleaning and recoating.
- C. Sealants and Flashings shall be inspected on a regular basis and repairs made as necessary.

## PART II PRODUCTS

### 2.1 MANUFACTURER

- A. System Manufacturer, Basis of Design: Subject to compliance with the requirements, Dryvit Systems, Inc.,
  1. Subject to compliance with the requirements, additional acceptable manufacturers may be selected as pre-approved equals prior to submission of bids in accordance with provisions of the "Special Terms and Conditions of the IFB." Comply with "Request for Approved Equal."
- B. All components of the Exterior Insulation and Finish System shall be supplied or obtained from The Exterior Insulation and Finish System Manufacturer or its authorized distributors. Substitutions or additions of materials other than specified will void the warranty.

### 2.2 MATERIALS

- A. Portland Cement: Shall be Type I or II, meeting ASTM C 150, white or gray in color, fresh and free of lumps.
- B. Water: Shall be clean and free of foreign matter.

## 2.3 COMPONENTS

- A. Air/Water-Resistive Barrier Components, Basis of Design:
1. Dryvit Backstop NT: A flexible, polymer-based noncementitious water-resistive and air barrier coating available in Texture, Smooth, and Spray.
  2. Dryvit Grid Tape™: An open weave fiberglass mesh tape with pressure sensitive adhesive available in rolls 102 mm (4 in) wide by 91 m (100 yds) long.
  3. Dryvit Backstop DMS: A sprayable single step water-resistive membrane/air barrier and adhesive.  
**NOTE: Backstop DMS is not approved for use over wood based substrates.**
- B. Flashing Materials, Basis of Design: Used to protect substrate edges at terminations.
1. Liquid Applied: An extremely flexible water-based polymer material, ready for use.
    - a. Shall be AquaFlash and AquaFlash Mesh
  2. Sheet Type:
    - a. Shall be Flashing Tape and Surface Conditioner
      - 1) Dryvit Flashing Tape™: A high density polyethylene film backed with a rubberized asphalt adhesive available in rolls 102 mm (4 in), 152 mm (6 in) and 229 mm (9 in) wide by 23 m (75 ft) long.
      - 2) Dryvit Flashing Tape Surface Conditioner™: A water-based surface conditioner and adhesion promoter for the Dryvit Flashing Tape.
- C. Dryvit AP Adhesive™, Basis of Design: A moisture cure, urethane-based adhesive used to adhere the Dryvit Drainage Strip™ and Drainage Track.
- D. Drainage Track, Basis of Design: UV treated PVC "J" channel perforated with weep holes, complying with ASTM D 1784 and ASTM C 1063. Drainage track usage is limited to the base of the system at finished grade level when installing system in noncombustible construction. All other horizontal terminations shall utilize the Dryvit Drainage Strip as shown in Outsulation Plus MD Installation Details, DS110. Shall be one of the following:
1. Starter Trac STWP – without drip edge by Plastic Components, Inc.
  2. Starter Trac STDE – with drip edge by Plastic Components, Inc.
  3. Universal Starter Track by Wind-lock Corporation
  4. Sloped Starter Strip with Drip by Vinyl Corp.
- E. Dryvit Drainage Strip, Basis of Design: A corrugated plastic sheet material, which provides drainage.
- F. Adhesives, Basis of Design: Used to adhere the EPS to the air/water-resistive barrier, shall be compatible with the water-resistive barrier and the EPS.
1. Cementitious: A liquid polymer-based material, which is field mixed with Portland cement.
    - a. Shall be Primus, Genesis or Genesis<sup>®</sup> FM
  2. Ready mixed: A dry blend cementitious, copolymer-based product, field mixed with water.
    - a. Shall be Primus<sup>®</sup> DM, Genesis<sup>®</sup> DM, Genesis<sup>®</sup> DMS, Rapidry DM 35-50 or Rapidry DM 50-75
- G. Insulation Board, Basis of Design: Expanded Polystyrene meeting Dryvit Specification for Insulation Board, DS131.
1. Thickness of insulation board shall be as required for finish surface of the EIFS to match existing adjacent surface.
  2. The insulation board shall be manufactured by a board supplier listed by Dryvit Systems, Inc.
- H. Base Coat: Shall be compatible with the EPS insulation board and reinforcing mesh(es).
1. Cementitious, Basis of Design: A liquid polymer-based material, which is field mixed with Portland cement.
    - a. Shall be Primus, Genesis or Genesis FM
  2. Noncementitious, Basis of Design: A factory-mixed, fully formulated, water-based product.
    - a. Shall be NCB
  3. Ready mixed, Basis of Design: A dry blend cementitious, copolymer-based product, field mixed with water.
    - a. Shall be Primus DM, Genesis DM, Genesis DMS, Rapidry DM 35-50 or Rapidry DM 50-75.
- I. Reinforcing Mesh, Basis of Design: A balanced, open weave, glass fiber fabric treated for compatibility with other system materials. **NOTE: Reinforcing meshes are classified by impact resistance and specified by weight and tensile strength as listed in Section 1.04.D.1.d.**
1. Shall be Standard, Standard Plus, Intermediate, Panzer 15, Panzer 20, Detail and Corner Mesh

2. Shall be colored blue for product identification bearing the Dryvit logo.
- J. Finish, Basis of Desing: Shall be the type, color and texture as selected by the architect/owner and shall be one or more of the following:
  1. Standard DPR (Dirt Pickup Resistance): Water-based, acrylic coating with integral color and texture and formulated with DPR chemistry:
    - a. Texture to match existing adjacent surfaces.
    - b. Color to be selected by Owner from standard color pallet.
  2. Coatings, Primers and Sealers:
    - a. Color Prime

## PART III EXECUTION

### 3.1 EXAMINATION

- A. Prior to installation of the Exterior Insulation Finish System, the contractor shall verify that the substrate:
  1. Is of a type listed in Section 1.04.C.1.
  2. Is flat within 1/4 in in a 4 ft radius.
  3. Is sound, dry, connections are tight; has no surface voids, projections, or other conditions that may interfere with the Exterior Insulation Finish System installation or performance.
- B. Prior to installation of the Exterior Insulation Finish System, the general contractor shall insure that all needed flashings and other waterproofing details have been completed, if such completion is required prior to the Exterior Insulation Finish System application. Additionally the Contractor shall ensure that:
  1. Metal roof flashing has been installed in accordance with the manufacturer's requirements, Asphalt Roofing Manufacturers Association (ARMA) Standards and Dryvit Outsulation Plus MD Installation Details, DS110, or as otherwise necessary to maintain a watertight envelope.
  2. Openings are flashed in accordance with the Exterior Insulation Finish System Manufacturer's Installation Details, or as otherwise necessary to prevent water penetration.
  3. Windows, doors, etc. are installed and flashed per manufacturer's requirements and the Exterior Insulation Finish System Manufacturer's Installation Details.
- C. Prior to the installation of the Exterior Insulation Finish System, the contractor shall notify the general contractor, and/or architect, and/or owner of all discrepancies.

### 3.2 PREPARATION

- A. The Exterior Insulation Finish System materials shall be protected by permanent or temporary means from inclement weather and other sources of damage prior to, during, and following application until completely dry.
- B. Protect adjoining work and property during Exterior Insulation Finish System installation.
- C. The substrate shall be prepared as to be free of foreign materials, such as oil, dust, dirt, form-release agents, efflorescence, paint, wax, water repellants, moisture, frost, and any other condition that may inhibit adhesion.

### 3.3 INSTALLATION

- A. The system shall be installed in accordance with the manufacturer's system application Instructions.
- B. The overall minimum base coat thickness shall be sufficient to fully embed the mesh. The recommended method is to apply the base coat in two (2) passes.
- C. Sealant shall not be applied directly to textured finishes or base coat surfaces. EIFS surfaces in contact with sealant shall be coated with Demandit or Color Prime.
- D. High impact meshes shall be installed as specified at ground level, high traffic areas and other areas exposed to or susceptible to impact damage.

### 3.4 FIELD QUALITY CONTROL

- A. The EPS supplier shall certify in writing that the EPS meets Exterior Insulation Finish System Manufacturer's specifications.
- B. The sealant contractor shall certify in writing that the sealant application is in accordance

with the sealant manufacturer's and the Exterior Insulation Finish System Manufacturer's recommendations.

### 3.5 CLEANING

- A. All excess materials shall be removed from the job site by the contractor in accordance with contract provisions and as required by applicable law.
- B. All surrounding areas shall be left free of debris and foreign substances resulting from the contractor's work.

### 3.6 PROTECTION

- A. The EIFS System shall be protected from inclement weather and other sources of damage until dry and permanent protection in the form of flashings, sealants, etc. are installed.

END OF SECTION 07 24 19

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

- A. Removal of existing roofing.
- B. Repair of existing shingle roofing system.
- C. Fiberglass-reinforced asphalt roofing shingles.
- D. Leak barrier.
- E. Underlayment.
- F. Metal flashing associated with shingle roofing.

### 1.2 RELATED SECTIONS

- A. Section 07 62 00 - Flashing and Sheet Metal: Sheet metal flashing not associated with shingle roofing.
- B. Section 09 91 00 - Painting

### 1.3 REFERENCES

- A. AC438-1011-R1 - New Acceptance Criteria for Alternative Asphalt Roofing Shingles
- B. American Society of Civil Engineers (ASCE): ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. Asphalt Roofing Manufacturers Association (ARMA).
- D. ASTM International (ASTM):
  1. ASTM D 226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
  2. ASTM D 3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
  3. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
  4. ASTM D 3462 - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
  5. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  6. ASTM C 1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
  7. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
  8. ASTM D 4869 - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
  9. ASTM E 108 – Standard Test Methods for Fire Tests of Roof Coverings.
  10. ASTM E 903 - Standard Test Method for Solar Absorption, Reflectance and Transmission of Materials Using Integrating Spheres.

- E. Cool Roof Rating Council (CRRRC).
- F. ENERGYSTAR.
- G. National Roofing Contractors Association (NRCA).
- H. Sheet Metal and Air Conditioning Contractors National Association, 1nc. (SMACNA) - Architectural Sheet Metal Manual.
- I. Underwriters Laboratory (UL)
  - 1. UL 790 - Tests for Fire Resistance of Roof Covering Materials.
  - 2. UL 997 - Wind Resistance of Prepared Roof Covering Materials.

#### 1.4 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.

#### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, showing compliance with requirements.
- C. Installation Instructions: Manufacturer's installation instructions, showing required preparation and installation procedures.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.
- B. Installer Qualifications: Installer must be approved by manufacturer for installation of all roofing products to be installed under this section.

#### 1.7 REGULATORY REQUIREMENTS

- A. Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.
- B. Install all roofing products in accordance with all federal, state and local building codes.
- C. All work shall be performed in a manner consistent with current OSHA guidelines.

#### 1.8 PRE-INSTALLATION MEETINGS

- A. Convene a pre-installation meeting a minimum two weeks prior to starting work of this section.
  - 1. Contractor shall schedule and arrange meeting and meeting place and notify attendees.
  - 2. Mandatory Attendees: Roofing installer and manufacturer's steep slope technical representative (not sales agent).
  - 3. Optional Attendees: Owner's representative, Architect's representative, prime Contractor's representative.
  - 4. Review all pertinent requirements for achieving the warranty specified below and set schedule for final warranty inspection.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.
- B. Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in sunlight.
- C. Store bundles on flat surface to maximum height recommended by manufacturer; store rolls on end.
- D. Store and dispose of solvent-based materials in accordance with requirements of local authorities having jurisdiction.

## 1.10 WEATHER CONDITIONS

- A. Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with roofing shingle manufacturer's recommendations.

## 1.11 WARRANTY

- A. Provide manufacturer's standard warranty:
  - 1. Provide to the Owner a No Dollar Limit Shingle & Accessory Warranty.
    - a. Warranty Duration: 20 years.
- B. Installer's Warranty: Submit roofing Installer's warranty, signed by Installer, covering Work of this Section, including all components of roofing system, for the following guarantee period:
  - 1. Warranty Period: Two Years from date of Substantial Completion.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. A Manufacturer specializing in the production of Fiberglass Reinforced Asphalt Shingle Systems as described in this specification that has been approved by and is inspected by Underwriters Laboratories.
- B. At repair areas, Manufacturer shall be same as the Manufacturer of the shingles in place.
- C. Requests for Prior Approval will be considered in accordance with provisions of the "Special Terms and Conditions of the IFB". Comply with "Request for Approved Equal."

### 2.2 SHINGLES

- A. Dimensional, laminated glass-fiber reinforced asphalt shingles:
  - 1. Mineral granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced core.
  - 2. Architectural laminate styling provides a wood shake appearance with a 5 5/8in. exposure.
  - 3. Rated by the Cool Roof Rating Council (CRRC), Title 24 compliant and meets initial Energy Star performance levels.
    - a. Initial Reflectance Value 0.26 min.
    - b. Initial Emittance Value 0.90 min.
    - c. Initial Solar Reflectance Index 28 min.
  - 4. UL 790 Class A Fire Resistance rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Dept of Insurance Approved, ICC Report Approval.



5. Color as selected by Architect. At repair areas, match existing.

### 2.3 HIP AND RIDGE SHINGLES

- A. Distinctive self-sealing hip and ridge cap shingle complementing the color of selected roof shingle. 10in. Ridge Cap Shingles shall be manufactured and provided by provided by the Asphalt Shingle Manufacturer.

### 2.4 STARTER STRIPS

- A. Self sealing starter shingle designed for all roof shingles. Starter strip shall be manufactured and provided by the Asphalt Shingle Manufacturer.

### 2.5 LEAK BARRIER

- A. Self-adhering, self sealing, bituminous leak barrier surfaced with fine, skid-resistant granules. Approved by UL, Dade County, ICC, State of Florida and Texas Department of Insurance. Leak Barrier shall be manufactured and provided by the Asphalt Shingle Manufacturer.

### 2.6 UNDERLAYMENT

- A. 30# Roofing Underlayment: Water repellent breather type cellulose fiber building felt. Meets or exceeds the requirements of ASTM D 4869 Type IV and ASTM D 226 Type II.

### 2.7 ROOFING CEMENT

- A. Asphalt Plastic Roofing Cement, asbestos free, meeting the requirements of ASTM D 4586, Type I or II.

### 2.8 ROOF ACCESSORIES

- A. Compression Collars: UV stable solid molded PVC compression collar, Kynar PVDF coated 24 gauge galvanized flange, Ultimate Pipe Flashing by Lifetime Tool or pre-approved equal.

### 2.9 NAILS

- A. Nails: Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, smooth, barbed or deformed shank, with heads 3/8 inch to 7/16 inch in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch or through plywood or oriented strand board by at least 1/8 inch. Staples are not permitted. Nails shall not penetrate through the bottom surface of roof decks that are exposed to view.

### 2.10 METAL FLASHING

- A. Galvanized Steel: 24 gauge hot-dip galvanized steel sheet, complying with ASTM A 653/A 653M, G90/Z275.
- B. Aluminum: 0.032-inch aluminum sheet, complying with ASTM B 209.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until roof deck has been properly prepared.

### 3.2 REMOVAL OF EXISTING ROOFING

- A. Remove all existing roofing down to the roof deck.

- B. Verify that deck is dry, sound, clean and smooth, free of depressions, waves and projections.
- C. Cover with sheet metal all holes over 1 inch diameter, cracks over 1/2 inch in width, loose knots and excessively resinous areas.
- D. Replace damaged deck with new materials.
- E. Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

### 3.3 PREPARATION OF SUBSTRATE

- A. Clean deck surfaces thoroughly prior to installation of leak barrier and roof deck protection.
- B. At areas to receive leak barrier, fill knot holes and cracks with latex filler.

### 3.4 INSTALLATION OF UNDERLAYMENT

- A. Install using methods recommended by manufacturer in accordance with local building code. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
- B. Eaves:
  1. Place eave edge metal flashing tight with fascia boards; lap joints 3 inches and seal with plastic cement; nail at top of flange.
  2. On roofs with slope between 2:12 and 4:12, and on all roofs in the north, install leak barrier up the slope from eave edge to 36 inches from the edge or at least 24 inches beyond the interior face of the warm exterior wall, whichever is greater; lap ends 6 inches and bond. Install felt underlayment on top of leak barrier to the eave edge and up the slope.
- ~~C. Valleys:~~
  - ~~1. Install leak barrier at least 36 inches wide centered on valley; lap ends 6 inches and seal.~~
  - ~~2. Where valleys are indicated to be "open valleys", install metal flashing over leak barrier before roof deck protection is installed; DO NOT NAIL THROUGH metal flashing; secure by nailing at 18 inches on center just beyond edge of flashing so that nail heads hold down edge.~~
- D. Hips and Ridges:
  1. Install leak barrier along entire lengths. If ridge vents are to be installed, position the leak barrier so that the ridge slots will not be covered.
- E. Roof Deck:
  1. Install one layer of roof deck protection over entire area not protected by valley membrane; run sheets horizontally lapped so water sheds; nail in place.
  2. On roofs sloped between 2 in 12 and 4 in 12, lap horizontal edges at least 19 inches and over eave protection membrane.
  3. Lap ends at least 4 inches; stagger end laps of each layer at least 36 inches.
  4. Lap roof deck protection over valley protection at least 6 inches.
- F. Penetrations:
  1. At vent pipes, install a 24 inch square piece of leak barrier lapping over roof deck protection; seal tightly to pipe.
  2. At vertical walls, install leak barrier extending at least 6 inches up the wall and 12 inches on to the roof surface lapping over roof deck protection.
  3. At skylights and roof hatches, install leak barrier up the sides of the frame and 12

- inches on to the roof surface on all sides, lapping over roof deck protection.
4. At rake edges, install metal edge flashing over leak barrier and roof deck protection; set tight to rake boards; lap joints at least 2 inches and seal with plastic cement; secure with nails.

### 3.5 INSTALLATION OF SHINGLES

- A. Install in accordance with manufacturer's instructions and requirements of local building code.
  1. Avoid breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F.
  2. Handle carefully in hot weather to avoid damaging shingle edges.
  3. Secure with 4 to 6 nails per shingle; use number of nails required by manufacturer or by code, whichever is greater. Nails must be long enough to penetrate through plywood or OSB, or 3/4 inch into dimensional lumber.
- B. Install hip and ridge shingles as required by the manufacturer. At ridges, install hip and ridge shingles over ridge or ridge vent material.
- C. ~~Make valleys using "open valley" technique:~~
  1. ~~Snap diverging chalk lines on metal flashing, starting at 3 inches (75 mm) each side of top of valley, spreading at 1/8 inch per foot (9 mm per meter) to eave.~~
  2. ~~Run shingles to chalk line.~~
  3. ~~Trim last shingle in each course to match chalk line; do not trim shingles to less than 12 inches (305 mm) width.~~
  4. ~~Apply 2 inches (50 mm) wide strip of plastic cement under ends of shingles, sealing to metal flashing.~~
- D. ~~Make valleys using "closed cut valley" technique:~~
  1. ~~Run the first, and only the first, course of shingles from the higher roof slope across the valley at least 12 inches.~~
  2. ~~Run all courses of shingles from the lower roof slope across the valley at least 12 inches and nail not closer than 6 inches to center of valley.~~
  3. ~~Run shingles from the upper roof slope into valley and trim 2 inches from center of valley.~~
- E. All penetrations are to be flashed according to roof manufacturer's requirements, ARMA and NRCA application instructions and construction details.

### 3.6 PROTECTION

- A. Stage work progress so that traffic is minimized over completed roofing.
- B. Protect installed products until completion of project

END OF SECTION 07 31 13.13

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Replacement of existing roof system with new single ply membrane roofing system.
- B. Removal and legal disposal, offsite, of all existing BUR system and insulation to the deck substrate.
- C. Removal and legal disposal, offsite, of all existing base flashings on walls and penetrations including all lead jacks.
- D. Inspection and repair of existing roof deck.
- E. Removal, and retention for reinstallation, of the bottom metal piece of the two piece reglet to allow for the termination of the new membrane wall flashings direct to the substrate.
- F. Provision and installation of polyisocyanurate insulation:
  - 1. Mechanically attached to deck. Total flat insulation thickness to be 1”.
- G. Provision and installation of pre-engineered polyisocyanurate crickets at twice the slope rate of the deck to direct water flow to the roof drains and thru wall scuppers.
- H. Provision and installation of a layer of ¼ inch glass mat cover board over the insulation layers:
  - 1. All insulation and cover board layers mechanically attached with roof manufacturer’s screws and plate system in a pattern to achieve the specified wind uplift requirements as dictated by the furnished wind calculation.
- I. Provision and installation of a custom prefabricated 60 mill high strength, energy efficient, maintenance free PVC based CPA thermoplastic roof system fully adhering with water based adhesive to the cover board layer.
- J. Provision and installation of roof manufacturer’s prefabricated wall flashings of same membrane to the highest point possible under the reglet base piece. Terminate all wall flashings by the triple seal method.
- K. Provision and installation of roof manufacturer’s prefabricated vinyl coated metal pitch pans on any line sets.
- L. Provision and installation of roof manufacturer’s custom factory prefabricated vinyl coated metal scuppers with factory welded attachment skirts in all scupper openings.
- M. Provision and installation of roof manufacturer’s 30 by 60 inch walk pads with factory welded attachment skirts in areas as designated by the Districts facility management.
- N. Provision and scheduling of an intensive post project factory inspection to be performed by a trained quality assurance technician employed by the roofing system manufacturer. The installing contractor shall have his own technicians on site during the inspection to perform any punch list corrections at that time.

- O. Provision of a standardly published roof system manufacturer's twenty (20) year NDL (no dollar limit) warranty with the first fifteen years also featuring consequential damage coverage.

## 1.2 SYSTEM COMPONENTS

- A. PVC thermoplastic membrane adhered with water-based adhesive.
- B. Glass Mat Cover Board.
- C. Roof Manufacturer's polyisocyanurate rigid insulation board (tapered), attached with mechanical fasteners as indicated in these specifications.
- D. Roof Manufacturer's polyisocyanurate rigid insulation board (flat), attached with mechanical fasteners as indicated in these specifications.
- E. Prefabricated flashings, corners, parapets, stacks, vents, and related details.
- F. Fasteners, adhesives, and other accessories required for a complete roofing installation.
- G. Traffic Protection.

## 1.3 REFERENCES

- A. NRCA - The NRCA Roofing and Waterproofing Manual.
- B. ASCE 7 - Minimum Design Loads For Buildings And Other Structures.
- C. UL - Roofing Materials and Systems Directory, Roofing Systems (TGFU.R10128).
- D. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- E. ASTM D 751 - Standard Test Methods for Coated Fabrics.
- F. ASTM D 4434 - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.
- G. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
- H. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

## 1.4 SYSTEM DESCRIPTION

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
- C. Physical Properties:
  - 1. Roof product must meet the requirements of Type III PVC sheet roofing as defined by ASTM D 4434 and must meet or exceed the following physical properties.
  - 2. Thickness: 60 mil, nominal, in accordance with ASTM D 751.
  - 3. Thickness Over Scrim:  $\geq 28$  mil in accordance with ASTM D 751.
  - 4. Breaking Strengths:  $\geq 390$  lbf. (MD) and  $\geq 438$  lbf. (XMD) in accordance with ASTM D 751, Grab Method.
  - 5. Elongation at Break:  $\geq 31\%$  (MD) and  $\geq 31\%$  (XMD) in accordance with ASTM D 751, Grab Method.
  - 6. Heat Aging in accordance with ASTM D 3045: 176 °F for 56 days. No sign of cracking, chipping or crazing. (In accordance with ASTM D 4434).

7. Factory Seam Strength:  $\geq 431$  lbf. in accordance with ASTM D 751, Grab Method.
  8. Tearing Strength:  $\geq 132$  lbf. (MD) and  $\geq 163$  lbf. (XMD) in accordance with ASTM D 751, Procedure B.
  9. Low Temperature Bend (Flexibility): Pass at  $-40$  °F in accordance with ASTM D 2136.
  10. Accelerated Weathering: No cracking, checking, crazing, erosion or chalking after 5,000 hours in accordance with ASTM G 154.
  11. Linear Dimensional Change:  $< 0.5\%$  in accordance with ASTM D 1204 at  $176 \pm 2$  °F for 6 hours.
  12. Water Absorption:  $< 2.6\%$  in accordance with ASTM D 570 at  $158$  °F for 166 hours.
  13. Static Puncture Resistance:  $\geq 56$  lbs. in accordance with ASTM D 5602.
  14. Dynamic Puncture Resistance:  $\geq 14.7$  ft-lbf. in accordance with ASTM D 5635.
- D. Cool Roof Rating Council (CRRC):
1. Membrane must be listed on CRRC website.
    - a. Initial Solar Reflectance:  $\geq 88\%$
    - b. Initial Thermal Emittance:  $\geq 87\%$
    - c. Initial Solar Reflective Index (SRI):  $\geq 111$
    - d. 3-Year Aged Solar Reflectance:  $\geq 68\%$
    - e. 3-Year Aged Thermal Emittance:  $\geq 84\%$
    - f. 3-Year Aged Solar Reflective Index (SRI):  $\geq 82$
- E. Insulation
1. Roof manufacturer supplied polyisocyanurate rigid insulation board, LTTR 5.7 per inch of thickness.
    - a. Facings to be compatible with roof materials and methods of installation.
  2. Tapered Insulation Slope: 1/2 inch per foot or twice the rate of the deck slope at crickets.
  3. Configuration as indicated on the Drawings.

## 1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Submit data on each product to be used, including:
  1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.
  4. Maintenance requirements.
  5. Product test reports for roof materials, documentation indicating that roof materials comply with Solar Reflectance Index requirement.
  6. Product Data for adhesives and sealants used inside the weatherproofing system, documentation including printed statement of VOC content.
  7. Laboratory Test Reports for adhesives and sealants used inside the weatherproofing system, documentation indicating that products comply with the testing and product requirements of

California Department of Public Health's "Standard Method or the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

8. Roof deck fastener pullout test and core cut.
  9. Research/ Evaluation Reports: For components of membrane roofing system, from ICC-ES.
- C. Shop Drawings: Indicate insulation pattern, overall membrane layout, field seam locations, joint or termination detail conditions, and location of fasteners.
- D. Verification Samples: For each product specified, two samples, representing actual product, color, and finish.
1. 4 inch by 6 inch sample of roofing membrane, of color specified.
  2. 4 inch by 6 inch sample of walkway pad.
  3. Termination bar and coping metal to be used.
  4. Each fastener type to be used for installing membrane, insulation/recover board, termination bar and edge details.
  5. Reglets and counter flashing, 6" length.
- E. Installer Certification: Certification from the roofing system manufacturer that Installer is approved, authorized, or licensed by manufacturer to install the specified roofing system.
- F. Manufacturer's warranties and a letter on the Manufacturer's letterhead indicating the Manufacturer's intent to warrant the completed work.

#### 1.6 QUALITY ASSURANCE

- A. Perform work in accordance with manufacturer's installation instructions.
- B. Manufacturer Qualifications: A manufacturer specializing in the production of PVC membranes systems and utilizing a Quality Control Manual during the production of the membrane roofing system that has been approved by and is inspected by Underwriters Laboratories.
- C. Installer Qualifications: Company specializing in installation of roofing systems similar to those specified in this project and approved by the roofing system manufacturer.
- D. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.
- E. Test Reports:
1. Roof deck fastener pullout test.
- F. There shall be no deviations from the roof membrane manufacturer's specifications or the approved shop drawings without the **prior** written approval of the manufacturer.

#### 1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly wind uplift and fire hazard requirements.
- B. Fire Exposure: Provide membrane roofing materials with the following fire-test-response characteristics. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
1. Exterior Fire-Test Exposure:
    - a. Class B; ASTM E 108, for application and roof slopes indicated.

2. Fire-Resistance Ratings: Comply with ASTM E 119 for fire-resistance-rated roof assemblies of which roofing system is a part.
3. Conform to applicable code for roof assembly fire hazard requirements.

C. Wind Uplift:

1. Roofing System Design: Provide a roofing system designed to resist uplift pressures calculated according to the current edition of the ASCE-7 Specification *Minimum Design Loads for Buildings And Other Structures*. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.
2. Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE-7.

## 1.8 PRE-INSTALLATION MEETING

- A. Convene meeting not less than one week before starting work of this section.
- B. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following.
  1. Meet with Owner, Architect, Owner's insurer if applicable, School Facilities Board representative, roofing installer, roofing system manufacturer's representative, and any installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
  2. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening. Report to the Architect, in writing, any existing areas of ponding.
  4. Review structural loading limitations of roof deck during and after roofing.
  5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
  6. Review governing regulations and requirements for insurance and certificates if applicable.
  7. Review temporary protection requirements for roofing system during and after installation.
  8. Review roof observation and repair procedures after roofing installation.

## 1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Store roof materials and place equipment in a manner to avoid permanent deflection of deck.
- E. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.



## 1.10 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

## 1.11 WARRANTY

- A. Contractor's Warranty: The contractor shall warrant the roof application with respect to workmanship and proper application for two (2) years from the effective date of the warranty issued by the manufacturer.
- B. Manufacturer's Warranty: Must provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition the warranty must meet the following criteria:
  - 1. Warranty Period: 20 years from date issued by the manufacturer.
  - 2. First 15 years:
    - a. Must provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices.
    - b. NO EXCLUSIONS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.
  - 3. Last 5 years:
    - a. Excludes incidental and consequential damages.
  - 4. No exclusion for damage caused by ponding water.
  - 5. No exclusion for damage caused by biological growth.
  - 6. Issued direct from and serviced by the roof membrane manufacturer.
  - 7. Transferable for the full term of the warranty.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Roofing Membrane: Subject to compliance with requirements, provide a single ply polyvinyl chloride membrane roofing system as described below. Subject to compliance with the requirements, acceptable manufacturers include:
  - 1. Pre-Approved Manufacturer.
- B. All roofing system components to be provided or approved by the selected roofing manufacturer.
- C. Requests for substitutions will be considered in accordance with provisions of the "Special Terms and Conditions of the IFB." Comply with "Request for Approved Equal." Bids shall only include products by Pre-Approved Manufacturers.

### 2.2 ROOFING SYSTEM COMPONENTS

- A. Roofing Membrane: PVC thermoplastic membrane conforming to ASTM D 4434, type III, fabric-reinforced, PVC, NSF/ANSI 347 Gold or Platinum Certification, and a product-specific third-party verified Environmental Product Declaration. Membrane properties as follows:
  - 1. Thickness:
    - a. 60 mil.
  - 2. Exposed Face Color:

- a. White.
- 3. Minimum recycle content 7% post-industrial and 0% post-consumer.
- 4. Recycled at end of life into resilient flooring or concrete expansion joints.
- B. Accessory Materials: Provide accessory materials supplied by or approved for use by the Roofing Manufacturer.
  - 1. Sheet Flashing: Manufacturer's standard reinforced PVC sheet flashing.
  - 2. Roofing Manufacturer's Factory Prefabricated Flashings: manufactured using Manufacturer's standard reinforced PVC membrane.
    - a. Stack Flashings.
    - b. Curb Flashings.
    - c. Inside and Outside Corners.
    - d. Vinyl Coated Metal Scupper Inserts.
    - e. Vinyl Coated Pitch Pans.
  - 3. Sealants and Adhesives: Compatible with roofing system and supplied by Roofing Manufacturer.
    - a. Roofing Manufacturer's two component elastomeric polyurethane froth insulation adhesive.
    - b. Roofing Manufacturer's one-component, non-sag, elastomeric, neutral-cure silicone sealant.
    - c. Strip Mastic.
    - d. Pitch Pocket Filler.
  - 4. Slip Sheet: Compatible with roofing system and supplied by Roofing Manufacturer.
  - 5. Fasteners and Plates: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane and insulation to substrate. Supplied by Roofing Manufacturer.
    - a. #14 Heavy Duty Fasteners.
    - b. Zinc Plated Metal Anchors.
    - c. 3 inch Metal Plates.
  - 6. Termination and Edge Details: Supplied by Roofing Manufacturer.
    - a. Termination Bar.
    - b. Flat Coping.
  - 7. Vinyl Coated Metal: Supplied by Roofing Manufacturer. 24 gauge, hot-dipped galvanized, grade 90 metal with a minimum of 17 mil of Roofing Manufacturer's membrane laminated to one side.
- C. Walkpads:
  - 1. Provide non-skid, maintenance-free walkway pads in areas adjacent to service around mechanical equipment and leading to roof access points.
    - a. Walkway Pad supplied by Roofing Manufacturer.

## 2.3 ROOF INSULATION

- A. General:
  - 1. Provide preformed roof insulation boards that comply with requirements and referenced

- standards, as selected from manufacturer's standard sizes.
2. Provide preformed saddles, crickets, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- B. Polyisocyanurate Board Insulation: Complying with ASTM C 1289, Type II, Class 1, Grade 3 (25 psi) felt or glass-fiber mat facer on both major surfaces. Material as supplied by Roofing Manufacturer. Manufactured with a blowing agent that has zero ozone depletion potential (ODP) and virtually no global warming potential (GWP).
1. Flat Boards: a closed-cell polyisocyanurate foam core insulation board with an integrally laminated, fiber-reinforced facer which is compatible with Roofing Manufacturer's roof membranes.
  2. Tapered Boards: to form crickets. A closed-cell polyisocyanurate foam core insulation board with an integrally laminated, fiber-reinforced facer which is compatible with Roofing Manufacturer's roof membranes.

## 2.4 ROOF INSULATION ACCESSORIES

- A. General: Provide roof insulation accessories approved by the roof membrane manufacturer and as recommended by insulation manufacturer for the intended use.
- B. Insulation Adhesive: Provide Roofing Manufacturer's insulation adhesive for attaching insulation and/or insulation cover boards in conformance to specified design requirements.
  1. Two component elastomeric polyurethane froth insulation adhesive.
- C. Fasteners: Provide Roofing Manufacturer's factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening insulation and/or insulation cover boards in conformance to specified design requirements.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that the surfaces and site conditions are ready to receive work.
- B. Verify that the deck is supported and secured.
- C. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.
- D. Verify that the deck surfaces are dry and free of standing water, ice or snow.
- E. Verify that all roof openings or penetrations through the roof are solidly set.
- F. If substrate preparation is the responsibility of another contractor, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Prepare existing roof according to roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer, and requirements in this Section.
- B. Tear out all base flashings, counter flashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.
- C. Remove existing roofing system per manufacturer's written instructions.
- D. Remove existing protection/ insulation boards to structural roof deck.
- E. Remove and replace corroded, deteriorated or damaged decking as identified in moisture survey or as observed.
- F. Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units, ductwork and other

equipment on the roof or supported by curbs. Conform with the following:

1. Modify curbs as required to provide a minimum 8" base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
2. Secure top of flashing and install new metal counterflashing prior to re-installation of unit.
3. Perimeter nailers must be elevated to match elevation of new roof insulation.
- G. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.
- H. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 INSTALLATION PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Surfaces shall be clean, smooth, free of fins, sharp edges, loose and foreign material, oil, grease, and bitumen.

### 3.4 INSTALLATION

- A. Install insulation in accordance with the roof manufacturer's requirements.
- B. Insulation: Flat polyisocyanurate rigid insulation board, and tapered polyisocyanurate rigid insulation board.
  1. Install insulation in accordance with the roof manufacturer's requirements.
  2. Insulation shall be adequately supported to sustain normal foot traffic without damage.
  3. Where field trimmed, insulation shall be fitted tightly around roof protrusions with no gaps greater than ¼ inch.
  4. Tapered insulation boards shall be installed in accordance with the insulation manufacturer's shop drawings.
  5. No more insulation shall be applied than can be covered with the roof membrane by the end of the day or the onset of inclement weather.
  6. If more than one layer of insulation is used, all joints between subsequent layers shall be offset by at least 6 inches.
  7. Mechanical Attachment: Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet applicable design requirements.
    - a. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed must be replaced or corrected.
  8. Mechanically attach base layer(s) of polyisocyanurate (flat) insulation and adhere subsequent layer(s) with insulation adhesive. Install all layers in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.
  9. Mechanically attach base layer(s) of polyisocyanurate (tapered) insulation and adhere subsequent layer(s) with insulation adhesive. Install all layers in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.
- C. Insulation Cover Board: Glass Mat Cover Board.
  1. Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet applicable design requirements.

- a. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed must be replaced or corrected.
  - b. Attach boards in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.
- D. Roof Membrane: 60 mil, PVC thermoplastic membrane.
1. Use only membrane adhesive acceptable to the roof manufacturer's that meets the applicable design requirements.
    - a. Water-based membrane adhesive.
  2. Cut membrane to fit neatly around all penetrations and roof projections.
  3. Unroll roofing membrane and positioned with a minimum 6 inch overlap.
  4. Apply adhesive in accordance with the roof manufacturer's requirements.
    - a. Apply at the required rate in smooth, even coatings without voids, globs, puddles or similar irregularities. Use care not to contaminate the area of the membrane where hot air welding will occur.
  5. Follow guidelines outlined in the adhesive's Product Data Sheet.
  6. Read the adhesive's Material Safety Data Sheet (MSDS) prior to using the adhesive.
- E. Seaming:
1. Weld overlapping sheets together using hot air. Minimum weld width is 1-1/2 inches.
  2. Check field welded seams for continuity and integrity and repair all imperfections by the end of each work day.
- F. Membrane Termination/Securement: All membrane terminations shall be completed in accordance with the membrane manufacturer's requirements.
1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
  2. Provide securement at any angle change where the slope or combined slopes exceeds two inches in one horizontal foot.
- G. Flashings: Complete all flashings and terminations as indicated on the drawings and in accordance with the membrane manufacturer's requirements.
1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
    - a. Do not apply flashing over existing thru-wall flashings or weep holes.
    - b. Secure flashing on a vertical surface before the seam between the flashing and the main roof sheet is completed.
    - c. Extend flashing membrane a minimum of 6 inches (152 mm) onto the main roof sheet beyond the mechanical securement.
    - d. Use care to ensure that the flashing does not bridge locations where there is a change in direction (e.g. where the parapet meets the roof deck).
  2. Penetrations:
    - a. Flash all pipes, supports, soil stacks, cold vents, and other penetrations passing through the roofing membrane as indicated on the Drawings and in accordance with the membrane manufacturer's requirements.
    - b. Utilize custom prefabricated flashings supplied by the membrane manufacturer.

- c. Existing Flashings: Remove when necessary to allow new flashing to terminate directly to the penetration.
- 3. Pipe Clusters and Unusual Shapes:
  - a. Clusters of pipes or other penetrations which cannot be sealed with prefabricated membrane flashings shall be sealed by surrounding them with a prefabricated vinyl-coated metal pitch pan and sealant supplied by the membrane manufacturer.
  - b. Vinyl-coated metal pitch pans shall be installed, flashed and filled with sealant in accordance with the membrane manufacturer's requirements.
  - c. Pitch pans shall not be used where prefabricated or field fabricated flashings are possible.
- H. Edge Details:
  - 1. Provide edge details as indicated in this scope and on drawings.
  - 2. Coordinate installation of metal flashing and counter flashing specified in other sections.
  - 3. Join individual sections in accordance with the membrane manufacturer's requirements.
  - 4. Manufactured Roof Specialties: Coordinate installation of copings, downspouts and roof blocks specified in other sections.
- I. Walk pads:
  - 1. Install walk pads in accordance with the membrane manufacturer's requirements.
  - 2. Provide walk pads where indicated by the District's facility management.
  - 3. Install walkway pads at rooftop equipment access points, rooftop ladders and all other traffic concentration points regardless of traffic frequency.
  - 4. Do not install walkways over flashings or field seams until manufacturer's warranty inspection has been completed.
- J. Water cut-offs:
  - 1. Provide water cut-offs on a daily basis at the completion of work and at the onset of inclement weather.
  - 2. Provide water cut-offs to ensure that water does not flow beneath the completed sections of the new roofing system.
  - 3. Remove water cut-offs prior to the resumption of work.
  - 4. The integrity of the water cut-off is the sole responsibility of the roofing contractor.
  - 5. Any membrane contaminated by the cut-off material shall be cleaned or removed.

### 3.5 FIELD QUALITY CONTROL

- A. The membrane manufacturer's representative shall provide a comprehensive final inspection after completion of the roof system. All application errors shall be addressed and final punch list completed.

### 3.6 PROTECTION

- A. Protect installed roofing products from construction operations until completion of project.
- B. Where traffic is anticipated over completed roofing membrane, protect from damage using durable materials that are compatible with membrane.
- C. Repair or replace damaged products after work is completed.

### 3.7 PROJECT CLOSEOUT

- A. Provide specified warranty to Building Owner.
- B. Provide Roof Maintenance Manual to Building Owner.

END OF SECTION 07 54 19

## SHEET METAL FLASHING AND TRIM

## PART 1 GENERAL

## 1.1 SCOPE

- A. All labor, material, equipment and services necessary to furnish and install sheet metal work as shown on plans or specified herein. The scope of work includes, but may not be limited to: flashings, counter-flashings, reglets, gutters, downspouts, vent flashing and copings.

## 1.2 SPECIFIED PRODUCTS AND SUBSTITUTIONS

- A. Comply with "Request for Approved Equal" in the "Special Terms and Conditions of the IFB".

## 1.3 SUBMITTALS

- A. Submittals are required in accordance with Section 01 33 00.
- B. Submit Product Data for all counter-flashings, reglets, vent flashings and copings.
- C. Submit layouts and details of all sheet metal fabrications.

## PART 2 MATERIALS

- A. Sheet metal shall be galvanized iron that is of copper bearing steel having 2 ounce zinc coating.
- B. Galvanized iron shall be 24 gauge or as shown on the Drawings.
- C. Solder shall comply with ASTM B-32, Standard Specification for Solder Metal.
- D. Parapet Coping: Petersen Aluminum Corporation. PAC Continuous Cleat Coping or pre-approved equal. Incorporate continuous anchor cleats, concealed splice plates with neoprene sealant strips, and 12 foot continuous sections of Kynar finished 24 gauge steel coping cap. Include stainless steel fasteners, pre-formed coping corners. Metal coping cap color shall be as designated by the Owner's Representative. Shall be certified to meet design pressures as indicated in current edition of SPRI's Wind Resistance Standard for Edge Systems Used with Low Slope Roofing Systems and to comply with requirements of IBC. <https://www.pac-clad.com/products/coping-systems/>

## 3.1 INSTALLATION

- A. Accurately form work to sizes, shapes and dimensions shown and detailed, with all angles and lines in true alignment, straight, sharp, level and in proper place.
- B. Cope and flange intersections to accurately fit and solder together.
- C. Turn back exposed edges and hem 1/2".
- D. Install sheet metal in a tight and solid manner so as to minimize the appearance and size of joints.
- E. Joints other than expansion joints shall be soldered.
- F. Materials to be used on the exterior of the structure are to be installed in a watertight and weather-tight manner.
- G. Materials are to be installed plumb and level without bulges, waves or sags.

END OF SECTION 07 62 00



## PART 1 GENERAL

### 1.1 SCOPE

- A. All labor, material, equipment and services necessary to furnish and install roof accessories as shown on plans or specified herein. The scope of work includes, but may not be limited to: curbs, blocking, vents, and various supports.

### 1.2 SPECIFIED PRODUCTS AND SUBSTITUTIONS

- A. See Section 01 62 00.

### 1.3 SUBMITTALS

- A. Submittals are required in accordance with Section 01 33 00.
- B. Submit Product Data for all roof accessories proposed for use.
- C. Submit layouts and details of all accessories.

## PART 2 PRODUCTS

- A. Roof blocks:
  - 1. Support blocks for piping, conduits, ductwork, equipment.
  - 2. Recycled rubber, UV resistant.
  - 3. 10 year manufacturer's warranty.
  - 3. Clearline Technologies C-Port CX Series Roof Blocks or approved equal.
- B. Equipment Support Pads:
  - 1. Utility pads for HVAC and Electrical equipment.
  - 2. Recycled rubber, UV resistant.
  - 3. 10 year manufacturer's warranty.
  - 3. Clearline Technologies C-Port AIR-PORT UTILITY PADS or approved equal.
- C. Piping and Conduit Channel Supports:
  - 1. Replacement channel supports for piping and conduit.
  - 2. Recycled rubber, UV resistant.
  - 3. 14 gauge galvanized channel strut, 3/16" high, with strut and pipe clamps as needed..
  - 4. Spacing in accordance with applicable code.
  - 5. 10 year manufacturer's warranty.
  - 6. Clearline Technologies C-Port C Series Channel Support or approved equal.
- E. Roof Curbs:
  - 1. Roof Products, Inc. Phoenix, AZ, or approved equal.
  - 2. ASTM A 653 G90 hot-dipped galvanized steel, min. 18ga where supporting HVAC units.
  - 3. Mitered and welded corners. Bolted connections not acceptable.
  - 4. Internally reinforced for curbs exceeding 3 foot length.
  - 5. Wood nailers, factory installed, pressure treated.
  - 6. Insulation factory installed 1-1/2" thick three pound density.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Materials to be used on the exterior of the structure are to be installed in a watertight and weather-tight manner.
- B. All items to be installed per material manufacturer's instructions.
- C. Install or adjust roof curbs to match roof slope with top surface plumb and level.
- D. Curb height to be minimum 8" above finished roof level.

- E. Blocks are to be installed per manufacturer's printed instructions, unit selected based on weight to be supported.
- F. Curbs and vents to be flashed in per roof coating manufacturer's requirements.
- G. Materials are to be installed plumb and level without bulges, waves or sags.

END OF SECTION 07 72 00

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Joint sealants designed for interior and exterior above grade applications.
- B. Related Sections:
  - 1. Section 07 62 00 – Sheet Metal Flashing and Trim.
  - 2. Section 09 96 53 – Elastomeric Coatings.

### 1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
  - 1. Design number of joints and joint widths for maximum of plus or minus 50 percent movement.
  - 2. Design depth of sealant to be 1/2 width of joint.
    - a. Maximum Depth: 1/2 inch (13 mm).
    - b. Minimum Depth: 1/4 inch (6 mm).
- B. Performance Requirements: ASTM C920 Type S, Grade NS, Class 50, Use NT, M, A, G and O.

### 1.3 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: Submit manufacturer's technical bulletins and MSDS on each product.
- C. Samples:
  - 1. Initial Selection Purposes: For each product exposed to view, manufacturer's standard bead consisting of strips of actual products showing full range of colors available.
  - 2. Verification: 2 sets of each type and color of joint sealant required. Install joint sealant samples in 1/2 inch wide joints formed between two 6 inch long strips of material matching appearance of exposed surfaces adjacent to joint sealants.
- D. Submit laboratory tests or data validating product compliance with performance criteria specified.
- E. Submit list of references from 5 projects similar in scope to this Project. Include contact name and phone number of person charged with oversight of each project.

### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company regularly engaged in manufacturing and marketing of products specified in this Section.
  - 1. Manufacturer Qualifications: Company shall be ISO 9001:2000 Certified.
- B. Installer Qualifications: Qualified to perform Work specified by reason of experience or training provided by product manufacturer. Contractor shall be qualified in the field of concrete/ CMU repair with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- C. Mock-Ups:
  - 1. At start of Project, perform mock-up of required sealant Work at 1 area of building. Perform minimum of 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.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.
- B. Store products in a location protected from freezing, damage, construction activity, precipitation, and direct sunlight per manufacturer's recommendations.
- C. Condition products to approximately 60 degrees F (16 degrees C) to 70 degrees F (21 degrees C) for use per manufacturer's recommendations.
- D. Handle products with appropriate precautions and care as stated on Material Safety Data Sheet.

#### 1.6 PROJECT CONDITIONS

- A. Do not use products under conditions of precipitation, or in inclement or freezing weather. Verify that substrates are clean, dry, and frost-free. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions per manufacturer's recommendations if application during inclement weather occurs.

#### 1.7 WARRANTY

- A. Provide manufacturer's 5 year standard material warranty.
- B. Include coverage for replacement of sealant materials which fail to achieve water tight seal, exhibit loss of adhesion or cohesion, or do not cure, provided sealant has been installed per manufacturer's recommendations.
- C. Warranty Exclusions: Failure resulting from concrete shrinkage, excessive movement structural cracks or defects, faulty construction, faulty design, faulty materials (other than joint sealants), improper installation, misuse of structure, settlement, or accident, fire, or other casualty or physical damage.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products from the following manufacturer:
  1. BASF Corporation  
Construction Chemicals
  2. Approved equal.
- B. Substitutions: Comply with "Request for Approved Equal" in the "Special Terms and Conditions of the IFB".
- C. Specifications and Drawings are based on manufacturer's proprietary literature from BASF Building Systems. Other manufacturers shall comply with minimum levels of material, color selection, and detailing indicated in Specifications or on Drawings. Architect will be sole judge of appropriateness of substitutions.

## 2.2 MATERIALS

- A. A premium, very low-modulus, high-movement, non-sag, fast-curing, ready-to-use, silyl-terminated polyether sealant. ASTM C 920 compliance:
  - 1. Type and Grade: S (single component) and NS (non-sag).
  - 2. Class: 100/50 for vertical joints.
  - 3. Use Related to Exposure: NT (non-traffic).
  - 4. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
  - 5. For use with EIFS per ASTM C1382.
  - 6. Acceptable Product: MasterSeal NP 150 (Formerly Sonolastic 150 VLM) Technology by BASF is considered to conform to the requirements of this specification
- B. Accessories:
  - 1. Soft Backer Rod by BASF, or approved equal.
  - 2. Closed Cell Backer Rod by BASF, or approved equal.
  - 3. Porous Substrate Primer: MasterSeal P 179 (formerly Primer 2000) by BASF, or approved equal.
  - 4. Cleaner: MasterSeal 990 (formerly Reducer 990) by BASF, or approved equal.

## 2.3 COLORS

- A. Colors - As selected by the Architect from the manufacturer's standard colors.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Comply with Division 01 requirements.
- B. Inspect areas involved in Work to establish extent of Work, access, and need for protection of surrounding construction.
- C. Examine joints for defects that would adversely affect quality of installation.
- D. Provide additional joint preparation, beyond that outlined in Specifications, as required by sealant manufacturer and Architect's recommendations based on mock-ups and field adhesion tests.

### 3.2 PREPARATION

- A. Remove loose materials and foreign matter that impair adhesion of joint sealant.
- B. Clean joints as required to expose sound surface free of contamination and laitance.
- C. Ensure structurally sound surfaces, dry, clean, free of dirt, moisture, loose particles, oil, grease, asphalt, tar, paint, wax, rust, waterproofing, curing and parting compounds, membrane materials, and other foreign matter.
- D. Concrete, Stone, and Other Masonry:
  - 1. Clean by grinding, sandblasting, or wire brushing to expose sound surface free of contamination and laitance.
  - 2. Prime masonry.
- E. Wood:
  - 1. Do not apply over freshly treated wood; treated wood must have weathered for at least 6 months.

2. Clean new and weathered wood. Scrape away loose paint to bare wood. If coatings cannot be removed, test coatings to verify adhesion of sealant or determine appropriate.
- F. Metal:
1. Remove scale, rust, and coatings from metal to expose bright white surface. Remove protective coatings as well as chemical residue or film.
  2. Aluminum Frames: Remove clear lacquer before application of joint sealants. If coatings cannot be removed, test coatings to verify adhesion of sealant or determine an appropriate primer.
  3. Prime the following surfaces with primer recommended by joint sealant manufacturer:
    - a. Copper.
    - b. Galvanized steel.
    - c. Fluorocarbon (Kynar) coatings.
  4. Remove other protective coatings or finishes that could interfere with adhesion.
- G. Glass:
1. Remove all oil and grease with xylene.
  2. Wipe clean and dry with a clean cloth until no solvent film or fingerprints remain.

### 3.3 PRIMING

- A. Where circumstances or substrates require primer, comply with the following requirements:
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. Depending on temperature and humidity, primer will be tack free in 15 to 120 minutes.
  3. Prime and seal on same workday.

### 3.4 INSTALLATION

- A. Back-Up Material:
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.
- B. Sealant:
1. Verify that temperature and moisture conditions are within manufacturer's acceptable limits.
  2. Using fresh sealant and equipment that is in proper working order, completely fill joint with sealant, filling from bottom up to avoid entrapping air.
  3. 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.
  4. Use dry tooling method. Do not use tooling agents such as soapy water or solvents that have not been approved by sealant manufacturer.

### 3.5 CURING TIME

- A. 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).

1. Skins: Within 1 hour.
2. Functional: Within 3 days.
3. Full Cure: Approximately 1 week.

### 3.6 INSPECTION

- A. During execution of Work, inspect Work to assure compliance with manufacturer's guidelines, these Specifications when they exceed manufacturer's guidelines, and good construction practice.
  1. Refer to latest revision of ASTM C1521 for test methods and frequency.
  2. Allow inspections of Work and assist in testing requested by manufacturer's representative and Architect.
- B. Non-Compliant Work: If inspections reveal non-compliant Work or Work that was not installed per Specifications, and/or manufacturer requirements, remove adjacent Work until a location is reached where installation was performed properly. Assist in spot-checking of remainder of Work.

### 3.7 CLEANING

- A. Remove uncured sealant and joint filler with xylene, toluene, MEK, or other sealant manufacturer approved solvent.
- B. Remove cured sealant by cutting with sharp-edged tool.
- C. Remove thin films by abrading.
- D. Remove debris related to application of sealants from Project site per applicable regulations for hazardous waste disposal.

### 3.8 PROTECTION

- A. Protect Work from contaminating substances and damage resulting from other construction operations or other causes so that sealed joints are without deterioration or damage at time of Project completion.

END OF SECTION 07 92 00

## SELF-LEVELING ELASTOMERIC JOINT SEALANTS

## Part 1 - General

## 1.01 Summary

- A. This specification describes the sealing of joints and cracks with a one-component, self-leveling, elastomeric polyurethane sealant.

## 1.02 Quality Assurance

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001:2008 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Safety Data Sheets for complete handling recommendations.

## 1.03 Delivery, Storage, and Handling

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

## 1.04 Job Conditions

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40°F (5°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified sealant.

## 1.05 Submittals

- A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, Color Samples and appropriate Safety Data Sheets (SDS).

## 1.06 Warranty

- A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.



## Part 2 - Products

### 2.01 Manufacturers

- A. Subject to compliance with requirements, Sikaflex-1c SL, as manufactured by Sika Corporation, is considered to be an acceptable product.
- B. Pre-Approved Equal.

### 2.02 Materials

- A. Polyurethane sealant:
  - 1. The joint sealant shall be a one-component, self-leveling, polyurethane-base material. It shall be applicable in horizontal joints. The sealant shall principally cure under the influence of atmospheric moisture to form an elastomeric substance.
- B. Backer rod or bond breaker tape as approved by Architect.

### 2.03 Performance Criteria

- A. Properties of the uncured polyurethane sealant:
  - 1. Initial Cure (Tack-Free Time): 1-2 hours
  - 2. Consistency: Self-leveling
  - 3. Color: As selected by Architect
- B. Properties of the cured polyurethane sealant:
  - 1. Tensile Properties (ASTM D-412) at 21 days Self-Leveling
    - a. Tensile Strength at break: minimum 150 psi
    - b. Tensile Elongation: minimum 320%
    - c. Modulus of Elasticity - 100% Elongation 110 psi, min.
  - 2. Shore A Hardness (ASTM D-2240) at 21 days:
    - a. Self-leveling: 40 +/-5
  - 3. Adhesion in Peel (ASTM C-794)
    - a. Mortar > 28 pli 0% Adhesion Loss
    - b. Aluminum > 30 pli 0% Adhesion Loss
    - c. Glass > 37 pli 0% Adhesion Loss
  - 4. Service Range: -40° to 170°F (-40° to 77°C)
  - 5. The sealant shall conform to Federal Specification TT-S-00230C, Type I, Class A.
  - 6. The sealant shall conform to ASTM C-920, Type S, Grade P, Class 25.
  - 7. The sealant shall be capable of ± 25% of the average joint width when tested in accordance to the durability bond test of Federal Specification TT-S-00230C and ASTM C-719.
  - 8. The sealant shall be non-staining.
  - 9. Final Cure: 3 to 5 days.
  - 10. VOC Content: 40 g/L

## Part 3 - Execution

### 3.01 Surface Preparation

- A. The joint and adjacent substrate must be clean, sound and free of standing water or surface contaminants. Remove all traces of the old sealant, dust, laitance, grease, oils, curing compounds, form release agents and foreign particles by mechanical means, i.e. – sandblasting, etc., as approved by the Architect. Blow joint free of dust using compressed air line equipped with an oil trap. Can be applied to green or damp concrete 24 hours after pour or 1 hour after getting wet.

### 3.02 Mixing and Application

#### A. Joints:

1. Install approved backer rod or bond breaker tape in all joints subject to thermal movement to prevent three-sided bonding and to set the depth of the sealant at a maximum of 1/2 in., measured at the center point of the joint width. Approval of the backer rod or bond breaker tape shall be made by the Architect.
2. Joints shall be masked to prevent discoloration or application on unwanted areas, as directed by the Architect. If masking tape is used, it shall not be removed before tooling, yet must be removed before the initial cure of the sealant. Do not apply the masking tape until just prior to the sealant application.
3. Install sealant into prepared joints when the joint is at mid-point of its expansion and contraction cycle.  
Self-leveling sealant: Pour or extrude the sealant into the prepared joint in one direction and allow it to flow and level as necessary. Avoid overlapping the sealant to eliminate the entrapment of air. Tool as required to properly fill the joint.
4. Adhere to all limitations and cautions for the polyurethane sealant in the manufacturer's printed literature.

#### B. Cracks:

1. Pour or extrude the sealant into the prepared crack in one direction and allow it to flow and level as necessary. Avoid overlapping the sealant to eliminate the entrapment of air. Tool as required to properly fill the crack.
2. Adhere to all limitations and cautions for the polyurethane sealant as stated in the manufacturers printed literature.

### 3.03 Cleaning

- A. The uncured polyurethane sealant can be cleaned with an approved solvent. The cured polyurethane sealant can only be removed mechanically.
- B. Leave work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. This specification covers all labor, materials, equipment and services necessary to furnish and install all hollow metal doorframes, including hardware and hollow metal doors, as specified on the plans and/or in the specifications.

1.02 REFERENCES

- A. All articles and services shall comply with provisions of the following specifications and standards, of latest edition, to the extent indicated by subsequent references.
1. National Association of Architectural Metal Manufacturers (NAAMM), "Hollow Metal Technical and Design Manual."
  2. American Society for Testing and Materials (ASTM), Designations and Standard Specifications.
  3. Steel Door Institute (SDI).
  4. American Welding Society (AWS).
  5. Underwriter's Laboratories, Inc. (UL).

1.03 SUBMITTALS per Section 1340

- A. Shop Drawings
1. Provide the following information on all hollow metal frames and other related materials specified in the Construction Documents:
    - a. Elevation of all doors, doorframes and window frames.
    - b. Hardware reinforcing details of frames.
    - c. Frame location schedule.
    - d. Complete frame descriptive nomenclature.
    - e. Material description and gauges.
    - f. Methods of anchorage.
    - g. Hardware preparation locations.
    - h. Louver frame details (if applicable).
    - i. Jamb and head details.
- B. Cross reference Shop Drawings to Construction Documents.
- C. Submit manufacturer's literature for prime paint and description of shop painting method and system for approval.

1.04 QUALITY ASSURANCE

- A. Certification
1. Fire Rated Assemblies - Submit manufacturer's written statement that construction of frame is in accordance with requirements for label rating indicated on drawings and/or as required by code.
  2. OSHA Compliance - All articles and services covered by this specification shall meet or exceed the safety standards established under the Federal Occupational Safety and Health Act, latest edition, together with all amendments in effect as of the date of this specification.
  3. Where provisions of pertinent codes, specifications, or standards conflict with this Section, the more stringent provisions shall govern.
  4. Labeled Frames - Conform with UL requirements for all labeled frame requirements. Provide UL label for fire resistive rating indicated. All labels shall be rivet attached.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Package, deliver, store and handle frames in a manner to prevent damage and deterioration.

- B. Store door frames upright in a protected dry area, above ground, with each unit separated at least 1/4" for air circulation. Place no more than 5 single-opening frames or 3 multi-opening frames in a group.
- C. Deliver metal frames in a timely manner to permit orderly progress of the work. Stockpile all items sufficiently in advance to ensure their availability when required.
- D. Follow any special storage and handling requirements of manufacturer.
- E. Each three-sided frame shall be provided with bracing and a removable spreader at open side to maintain squareness.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Frame and door manufacturer shall be the same.

### 2.02 COMPONENTS

- A. Sheet Steel - Cold or hot rolled, conforming to ASTM A366 or A569.
- B. Frames
  - 1. Door Frame - 16 gauge steel
  - 2. ~~Window Frame - 16 gauge steel~~
- C. Door Reinforcements
  - 1. For Hinges - 3/16" thick steel
  - 2. For Surface Hardware - 12 gauge steel
  - 3. For Closers - 12 gauge steel
  - 4. Anchors - 18 gauge steel
  - 5. Mortar boxes - 24 gauge steel
  - 6. Head Drips (where indicated on drawings and/or specifications) -18 gauge steel
- D. Metal Stud-Drywall Frames - Frames shall be formed with back bend returns to allow gypsum wallboard to be installed in proper alignment. Conform to profiles indicated on drawings.

### 2.03 FABRICATION

- A. General
  - 1. Fabricate with sharp arises, edges and corners, with surfaces free from warp, waves, buckles and dents.
  - 2. Fabrication shall conform to NAAMM or SDI standards and/or modifications contained in Construction Documents.
  - 3. Provide frames of size and design indicated.
- B. Welding
  - 1. All welding shall conform to applicable AWS standards for hollow metal work.
  - 2. Miter and cope corners. Corners shall be continuous welded on interior side (concealed) and ground smooth on exposed faces.
- C. Preparation for Hardware
  - 1. Reinforce and prepare frames to receive specified hardware.
  - 2. Make cutouts and mortises for mortise hardware.
  - 3. Provide reinforcement for hinges.
  - 4. Provide reinforcement for surface applied hardware.
  - 5. Reinforce all frames for door closers.
  - 6. Provide 24 gauge galvanized steel mortar boxes to completely enclose each reinforcement occurring in frames for concrete. Allow clear space inside as required for finish hardware.
  - 7. Punch lock side jambs for door silencers; for pairs of doors, locate silencers at head, one for each door, near meeting stiles.
  - 8. Drilling and tapping for mortise hardware shall be done in factory to approved hardware templates.

9. Drilling and tapping for surface applied hardware shall be done in field by frame installer.
10. Punch and dimple frames, for installation at concrete walls, to receive heads of 3/8" diameter flat head countersunk machine screws and auto body putty fill material.

D. ~~Window Frames~~

- ~~1. Provide 16 gauge removable frame stops on interior side. Form glazing stops integrally with frames on exterior or security side of frames.~~
- ~~2. Stops shall be sized to receive glass scheduled on drawings or specifications.~~

## 2.04 ACCESSORIES

- A. Head Drips - Provide for exterior doors, where indicated.
- B. Spreaders - Provide removable steel spreader at open end of each three sided frame.
- C. Anchors – Coordinate for new or existing construction.
  1. Jambs - Provide three at each jamb 7'0" high or less; one within 6" of head and sill, and other spaced equidistance between. Provide one additional anchor for each 24" (or fractional part thereof) on jambs higher than 7'0". Provide floor clips at floor line.
  2. Concrete Anchors - 18 gauge straps, 3" wide, with deformed tails. Weld to inside of frame section or 3/4" diameter pipe spacers welded to frame and anchor plate, with 3/8" diameter flat head machine bolts into expansion shields.
  3. Masonry Anchors - 18 gauge, loose "tee" type, 3" wide, with deformed tails or anchor pin.
  4. Metal Stud Anchors - 18 gauge formed steel "Z" shaped anchors. Size anchors to allow clearance for gypsum wallboard to be inserted between formed returns and anchors.
  5. Labeled frame anchors shall comply with UL requirements.

## 2.05 FINISHES

- A. Frame pieces shall be processed through a power spray washer to clean and phosphatize the steel.
- B. After the power wash, the door frame pieces shall be dried in a forced hot air dry-off oven and then painted with a primer in a dip priming tank. The frame pieces shall be completely immersed in the paint, then withdrawn, allowed to drain and then oven baked. The minimum dry film thickness for one coat of prime paint shall be 0.7 mil. The interior finish of frames shall be suitable for receiving grout fills without corroding.
- C. The primer shall be lead-free and contain rust inhibiting pigments and exhibit excellent adhesion to the base metal. The purpose of the primer coat is to provide a preparatory base for finish painting and to protect the metal surface until the top coat is applied.
- D. The baked primer shall meet ANSI Standard A224.1-1980 for salt spray test for 120 hours, humidity test of 240 hours with 20 inch lbs direct impact (1/2" ball).

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be installed. Verify that work of other trades is sufficiently complete and in the proper condition to receive the work of this Section.
- B. Coordinate with other trades as required to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

### 3.02 INSTALLATION

- A. Install standard steel frames and accessories in accordance with final Shop Drawings and manufacturer's data and as herein specified.
- B. Placement

1. Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames" unless otherwise indicated.
2. Except for frames located at in-place concrete or masonry and at drywall installation, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
3. In masonry construction, locate 3 wall anchors per jamb at hinge and strike levels.
4. At in-place concrete or masonry construction, set frames and secure to adjacent construction with galvanized machine screws and masonry anchorage devices.
5. Where frames are dimpled to receive machine screws or anchors, fill depressions flush with face of frame with auto body putty fill material.
6. Grout all hollow metal frames with portland cement grout with conventional aggregate. Lightweight aggregate not acceptable.
7. Install fire-rated frames in accordance with NFPA Standard No. 80 and UL requirements.
8. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws.
9. Wherever possible, leave frame spreader bars intact until frames are set perfectly square and plumb and all anchors are securely attached.

### 3.03 ADJUSTING

- A. Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

### 3.04 CLEANING

- A. Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer. Remove all rust before above specified touch-up is applied.
- B. When work of this Section has been completed, and at such other times as may be directed, remove all trash, debris, surplus materials, tools and equipment from site.

END SECTION 08 11 13

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. This specification covers all labor, materials, equipment and services necessary to furnish and install all hollow metal doors, as specified on the plans and/or in the specifications.

1.2 REFERENCES

- A. All articles and services covered by this specification shall comply with provisions of the following specifications and standards, of latest edition, to the extent indicated by subsequent references.
  - 1. National Association of Architectural Metal Manufacturers (NAAMM), "Hollow Metal Technical and Design Manual."
  - 2. American Society for Testing and Materials (ASTM), Designations and Standard Specifications.
  - 3. Steel Door Institute (SDI).
  - 4. American Welding Society (AWS).
  - 5. Underwriter's Laboratories, Inc. (UL).
  - 6. Frame and door manufacturer shall be the same.
  - 7. Where provisions of pertinent codes, specifications, or standards conflict with this Section, the more stringent provisions shall govern.

1.3 SUBMITTALS

A. Shop Drawings

- 1. Provide the following information on all doors and other related materials specified in the construction documents:
  - a. Elevation of all doors and door and window frames and all window frames.
  - b. Hardware reinforcing details of doors.
  - c. Door location schedule.
  - d. Complete door descriptive nomenclature.
  - e. Material description and gauges.
  - f. Methods of anchorage.
  - g. Hardware preparation locations.
  - h. Louver details (if applicable).
  - i. Cross-reference Shop Drawings to Construction Documents.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements

- 1. OSHA Compliance - All articles and services covered by this specification shall meet or exceed the safety standards established under the Federal Occupational Safety and Health Act, latest edition, together with all amendments in effect as of the date of this specification.

B. Certification

- 1. Fire Rated Assemblies - Submit manufacturer's written statement that construction of

doors is in accordance with requirements for label rating indicated on drawings and/or as required by code.

2. Product Data - Submit manufacturer's literature for prime paint and description of shop painting method and system for approval.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Package, deliver, store and handle doors and frames in a manner to prevent damage and deterioration.
- B. Store doors upright in a protected dry area, above ground, with each unit separated at least 1/4" for air circulation.
- C. Deliver metal doors in a timely manner to permit orderly progress of the work. Stockpile all items sufficiently in advance to ensure their availability when required.
- D. Follow any special storage and handling requirements of manufacturer.

## PART 2 PRODUCTS

### 2.1 COMPONENTS

#### A. Hollow Metal Doors

1. Hollow metal doors shall be flush type, 1-3/4" thick.
2. Hollow metal door face sheets shall be 18 gauge on all doors. Sheet steel shall be cold or hot rolled conforming to ASTM A366 or A569.
3. Door stiffeners (or cores) - Doors shall be stiffened by one of the following:
  - a. Vertical stiffeners, 20 gauge steel; 6" on center, full height of doors. Weld to face sheets 4" on center. Sound deadening insulation between ribs, consisting of noncombustible fiberglass, rock wool or equivalent.
  - b. Water-resistant resin-impregnated kraft honeycomb core stiffener, laminated to both face sheets with water-resistant adhesive.
  - c. Expanded foam core, self-extinguishing; resistant to vermin, mildew and rot. Bonded to face panels with thermosetting adhesive.
4. End channels - 16 gauge steel.
5. Reinforcements
  - a. For surface hardware - 3/16" thick steel.  
For strikes - 12 gauge steel or equal thread depth metal reinforcement.
6. Noise insulated doors - Doors noted as NC in door schedules shall be completely filled with self-extinguishing rigid urethane core formed in place and chemically bonded to all interior door faces.

### 2.2 FABRICATION

- A. Provide doors of size and design indicated. Doors shall be "full flush" type. With "flush cap".
- B. Fabrication shall conform to NAAMM or SDI standards and/or modifications contained in Construction Documents.
- C. Accurately form metal to required sizes and profiles, including astragals where required.
- D. Form and weld with sharp arises, edges and corners; surfaces shall be free from warp, waves, buckles, dents or other defects.
- E. Close top and bottom edges by flush welding channels at exterior doors. Provide "breather"



holes in door bottoms.

- F. Return face sheets on vertical edges of doors.
- G. Welding
  - 1. All welding shall conform to applicable AWS standards for hollow metal work.
  - 2. Weld all connections between component metal parts.
  - 3. Weld exposed joints and seams continuously full and grind smooth. No visible joints or seams on face or vertical edges.
- H. Labeled doors - Conform with UL requirements for all labeled door construction. Doors shall bear label for fire-resistive rating indicated in schedules. Locate label on hinge edge of door.
- I. Preparation for Hardware
  - 1. Reinforce and prepare doors for specified hardware.
  - 2. Make cutouts and mortises for mortise hardware. Drilling and tapping for mortise hardware shall be done in the factory to approved hardware templates.
  - 3. Provide 3/16" thick steel reinforcement for hinges.
  - 4. Provide 14 gauge reinforcement for surface applied hardware.
  - 5. Reinforce all doors for door closers.
  - 6. Bevel lock stiles 1/8" in 2" unless otherwise noted.
  - 7. Drilling and tapping for surface applied hardware will be done in field by door installer.
- J. Clearances
  - 1. Head - 1/8"
  - 2. Stiles - 3/32"
  - 3. Meeting stiles (pair doors) - 1/8"
  - 4. Over threshold - 3/16" or as detailed
  - 5. Over finish floor material - 3/8"

## 2.3 FINISHES

- A. Door pieces shall be processed through a power spray washer to clean and phosphatize the steel.
- B. After the power wash, the door pieces shall be dried in a forced hot air dry-off oven and then painted with a primer in a dip priming tank. The pieces shall be completely immersed in the paint, then withdrawn, allowed to drain and then oven baked. The minimum dry film thickness for one coat of prime paint shall be 0.7 mil.
- C. The primer shall be lead-free and contain rust inhibiting pigments and exhibit excellent adhesion to the base metal. The purpose of the primer coat is to provide a preparatory base for finish painting and to protect the metal surface until the top coat is applied.
- D. The baked primer shall meet ANSI Standard A224.1-1980 for salt spray test of 120 hours, humidity test of 240 hours with 20 inch lbs direct impact (1/2" ball).

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be installed. Verify that work of other trades is sufficiently complete and in the proper condition to receive the work of this Section.
- B. Coordinate with other trades as required to assure proper and adequate provision in the work

of those trades for interface with the work of this Section.

### 3.2 INSTALLATION

- A. Install standard steel doors and accessories in accordance with final Shop Drawings and manufacturer's data and as herein specified.
- B. Fit hollow metal doors accurately in frames, within clearances specified in SDI-100 and in this specification. Fitting by reducing metal thickness shall not be acceptable.
- C. Place fire-rated doors with clearances as specified in NFPA Standard No. 80 and UL requirements.
- D. Install hardware in accordance with drawings and hardware manufacturer's templates and instructions.
- E. Adjust operable parts for correct function.
- F. Remove hardware, except prime-coated items, tag, box and reinstall after finish painting has been completed.

### 3.3 ADJUSTING

- A. Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

### 3.4 CLEANING

- A. Prime Coat Touch-up - Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer. Remove all rust before above specified touch-up is applied.
- B. When work of this Section has been completed, and at such other times as may be directed, remove all trash, debris, surplus materials, tools and equipment from site.

END SECTION

## ALUMINUM FRAMED STOREFRONTS

## PART 1 – GENERAL

## 1.1 SUMMARY

## A. Section includes:

1. Aluminum-Framed Storefront
  - a. Arcadia, Inc., AG451T Series, 2" x 4-1/2" Thermally broken; center glazed system, screw spline, shear block, compensating stick or punched opening fabrication for 1" glass.

## B. Related Sections:

1. 07 24 19 Exterior Insulation Finish System
2. 07 92 00 Joint Sealants
3. 07 62 00 Sheet Metal Flashing and Trim
4. 08 81 23 Exterior Glass Glazing

## 1.2 REFERENCES

- B. American Architectural Manufacturers Association (AAMA)
- C. American Society for Testing and Materials (ASTM)
- D. Aluminum Association (AA)

## 1.3 SYSTEM DESCRIPTION

## A. General: In addition to requirements shown or specified, comply with:

1. Applicable provisions of AAMA Aluminum Storefront and Entrance Manual for design, materials, fabrication and installation of component parts.

## B. Design Requirements: Basis of design product Arcadia AG451T Series is a framing system that provides for flush glazing on all sides without projected stops, with glass in the center of the frame. Framing system suitable for outside or inside glazing.

## C. Performance Requirements:

1. Limit air leakage through assembly to 0.06 CFM/min/sq. ft. (.00003 m<sup>3</sup>/sm<sup>2</sup>) of wall area at 6.24 PSF (300 Pa) as measured in accordance with ASTM E283.
2. Water Resistance: No water leakage when measured in accordance with ASTM E331 with a static test pressure of 12PSF(480 Pa).
3. Limit mullion windload deflection of L/175 with full recovery of glazing materials, when measured in accordance with ASTM E 330.
4. System shall not deflect more than 1/8" at the center point, or 1/16" at the center point of a horizontal member, once deadload points have been established.
5. System shall accommodate expansion and contraction movement due to surface temperature differential of 180 degrees F.
6. Seismic testing shall conform to AAMA recommended static test method for evaluating performance of curtain walls and storefront wall systems due to horizontal displacements associated with seismic movements and building sway.
7. Thermal Performance – When tested in accordance with AAMA 1503.1 the following results should be attained: U-Maximum .63/CRF – minimum of 59.
8. National Fenestration Rating Council (NFRC) specific application evaluation.

## 1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Manufacturer Qualifications: A manufacturer capable of providing aluminum-framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.

C. Single Source Responsibility:

1. Obtain entrances, storefronts, ribbon walls, window walls, window systems, and finish through one source from a single manufacturer.
- D. Provide test reports from AAMA accredited laboratories certifying the performances as specified in 1.3.

#### 1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum-framed storefront system indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, flashing and drainage, operational clearances and installation details. Show connection to and continuity with adjacent thermal, weather, air and vapor retarders.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Sample Warranty.

#### 1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Structural failures including, but not limited to, excessive deflection.
    - b. Noise or vibration created by wind and thermal and structural movements.
    - c. Deterioration of metals, metal finishes and other materials beyond normal weathering.
    - d. Water penetration through fixed glazing and framing areas.
    - e. Failure of operating components.
  2. Warranty Period: Five years from date of Substantial Completion.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with the requirements, provide Arcadia AG451T Series or comparable product by one of the following:
  1. Kawneer North America
  2. U.S. Aluminum
  3. Pre-Approved Equal
- B. Source Limitations: Obtain all components of aluminum storefront system, including framing and accessories, from single manufacturer.

#### 2.2 FRAMING MATERIALS AND ACCESSORIES

- A. Framing members, transition members, mullions, adaptors, and mounting: Extruded 6063-T6 aluminum alloy (ASTM B221 – Alloy G.S. 10a T6).
- B. Screws, fastening devices, and internal components: Aluminum, stainless steel, or zinc-plated steel in accordance with ASTM.A-164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from aluminum.
- C. Glazing Gasket
  1. Compression-type design, replaceable, molded or extruded, or ethylene propylene diene monomer (EPDM).
  2. Shall be of type that locks securely into the glazing reglet to prevent glazing gaskets from disengaging.

#### 2.3 FINISH

- D. Finish all exposed areas of aluminum and components as indicated.
  1. An Architectural Class II or I anodic coating conforming with AA-M12C22A31/AA-M12C22A41.

- a. Anodized aluminum finish shall be Arcadia #11 Clear AC-2.

#### 2.4 SYSTEM FABRICATION

- A. Continuous sub-sill shall be provided under sill members to collect water infiltration and divert from the interior of the system.
- B. Framing members shall be internally reinforced and secured at head and sill as necessary for structural performance requirements, for hardware attachment, and as indicated.
- C. Fasteners shall be so located as to ensure concealment from view in the final assembly.

### PART 3 – EXECUTION

#### 3.1 EXAMINATIONS

- A. Examine conditions and verify substrate conditions are acceptable for product installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install in accordance with Drawings, Specifications Reviewed Shop Drawings and manufacturers installation instructions.
- B. Fit joints to produce hairline joints free of burrs and distortion.
- C. Rigidly secure non-movement joints.
- D. Seal perimeter and other joints watertight unless otherwise indicated.

#### 3.3 METAL PROTECTION

- A. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

#### 3.4 FIELD QUALITY CONTROL

- A. Test the storefront for water leaks in accordance with AAMA 501.2. Conduct test in the presence of the Architect. Correct deficiencies observed as a result of this test.

END OF SECTION 08 41 13

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- A. Glass and glazing units for the following products and applications, and glazing requirements referenced by other sections:
  - 1. Windows.
  - 2. Storefront framing.
- B. Glazing accessories.

### 1.2 RELATED SECTIONS

- A. 07 24 19 Exterior Insulation Finish System.
- B. 07 62 00 Sheet Metal Flashing and Trim.
- C. 07 92 00 Joint Sealants.
- D. 08 41 13 Aluminum Framed Entrances and Storefronts.

### 1.3 REFERENCES

- A. American Architectural Manufacturers Association:
  - 1. AAMA 800 - Voluntary Specifications and Test Methods for Sealants.
- B. American National Standards Institute:
  - 1. ANSI Z97.1 – American National Standard for Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test.
- C. ASTM International (ASTM):
  - 1. ASTM C162 - Standard Terminology of Glass and Glass Products.
  - 2. ASTM C 509 - Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
  - 3. ASTM C 864 - Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
  - 4. ASTM C 920 - Specification for Elastomeric Joint Sealants.
  - 5. ASTM C 1036 - Specification for Flat Glass.
  - 6. ASTM C 1048 - Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
  - 7. ASTM C 1087 - Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
  - 8. ASTM C 1115 - Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories.
  - 9. ASTM C 1172 - Specification for Laminated Architectural Flat Glass.
  - 10. ASTM C 1281 - Specification for Preformed Tape Sealants for Glazing Applications.
  - 11. ASTM C 1330 - Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
  - 12. ASTM C 1376 - Specification for Pyrolytic and Vacuum Deposition Coatings on Glass.
  - 13. ASTM E 774 - Specification for the Classification of the Durability of Sealed Insulating Glass Units.
  - 14. ASTM E 1300 - Practice for Determining Load Resistance of Glass in Buildings.
  - 15. ASTM E 2188 - Standard Test Method for Insulating Glass Unit Performance.
  - 16. ASTM E 2189 - Standard Test Method for Testing Resistance to Fogging in Insulating
  - 17. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
- D. Code of Federal Regulations:

1. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
- E. Glass Association of North America (GANA):
1. Glazing Manual.
  2. Laminated Glass Design Guide.
  3. Engineering Standards Manual.
  4. Sealant Manual
- F. The Insulating Glass Manufacturers Alliance (IGMA):
1. IGMA TB-3001 - Sloped Glazing Guidelines.
  2. IGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units.
- G. Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; Building Technologies Department; Windows & Daylighting Group, [windows.lbl.gov/software](http://windows.lbl.gov/software):
1. "LBNL Window 5.0 (or higher) - A PC Program for Analyzing Window Thermal and Optical Performance.
- H. National Fenestration Rating Council (NFRC):
1. NFRC 100 - Procedure for Determining Fenestration Product Thermal Properties.
  2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence.
  3. NFRC 300 - Procedures for Determining Solar Optical Properties of Simple Fenestration Products.
- I. National Fire Protection Association (NFPA):
1. NFPA 80 - Fire Doors and Windows.
  2. NFPA 252 - Fire Tests of Door Assemblies.
  3. NFPA 257 - Fire Test for Window and Glass Block Assemblies.

#### 1.4 DEFINITIONS

- A. Manufacturers of Primary Glass: Firms that produce primary glass, as defined in referenced industry publications.
- B. Manufacturers/Fabricators of Glass Products: Firms that utilize primary glass in the production of glass products that may include coated glass, laminated glass, and insulating glass.
- C. Sealed Insulating Glass Unit Surfaces:
1. Surface 1: Exterior surface of outer lite.
  2. Surface 2: Interspace-facing surface of outer lite.
  3. Surface 3: Interspace-facing surface of inner lite.
  4. Surface 4: Interior surface of inner lite.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems that will withstand loads and normal thermal movement without failure, including loss or glass breakage resulting from defective manufacture, fabrication, or installation; failure of glazing systems to remain watertight and airtight; or deterioration of glazing materials.
- B. Glass Design: Glass thicknesses indicated are minimums. Select actual glass lite thicknesses by analyzing loads and conditions. Provide glass lites in the thicknesses and in strengths required to meet or exceed the following criteria:
1. Glass Thicknesses: Comply with ASTM E 1300, as follows:
    - a. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set within 15 degrees of vertical and under wind load for a load duration of [3] seconds.
    - b. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow loads for a duration of [30] days.
    - c. Thickness of Tinted Glass: Provide the same thickness for each tint color for all applications.

- C. Thermal Movements: Allow for thermal movements of glazing components and glass framing members resulting from a temperature change range of 120 deg F ambient and 180 deg F material surfaces.
- D. Thermal and Optical Performance Properties: Provide glass meeting specified performance properties, based on manufacturer's published test data for units of thickness indicated, and the following:
  - 1. Center-of-Glass Values: Per LBNL Window 5.0 (or higher) analysis, as follows:
    - a. U-Factors: NFRC 100 expressed as Btu/sq. ft. x h x deg F.
    - b. Solar Heat Gain Coefficient: NFRC 200.
    - c. Solar Optical Properties: NFRC 300.

## 1.6 SUBMITTALS

- A. Product Data: Manufacturer's data sheets for each glass product and glazing material.
- B. Samples: 12-inch-square, for each type of glass product, other than monolithic clear float glass [or clear float glass only set in insulated glass units].
- C. Glazing Schedule: Prepare schedule using designations used on Drawings.
- D. Product Certificates: Signed by manufacturers/fabricators of glass products certifying that products furnished comply with project requirements.
- E. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer, based on submitted samples or acceptable data from previous testing of current formulations with similar products.
- F. Qualification Information: For Installer firm and Installer's manufacturer/fabricator-trained field supervisor.
- G. Warranties: Submit sample meeting warranties requirements of this Section.

## 1.7 QUALITY ASSURANCE

- A. Manufacturer/Source: Obtain each type of glass product from a single primary glass manufacturer and a single manufacturer/fabricator for each glass product type.
  - 1. For glass sputter-coated with solar-control low-e coatings, obtain glass products in fabricated units from a manufacturer/fabricator certified by the primary glass manufacturer.
- B. Installer Qualifications: Experienced Installer with minimum of 5 successful completed projects of similar materials and scope, approved by glass product manufacturer/fabricator.
- C. Preconstruction Adhesion and Compatibility Testing: Submit glass units, glazing materials, and glass-framing members with applicable finish to elastomeric glazing sealant manufacturer for determination of sealant compatibility, priming, and preparation requirements for optimum adhesion and performance.
- D. Glazing for Fire-Rated Door and Window Assemblies: Glazing tested per NFPA 252 and NFPA 257, as applicable, for assemblies complying with NFPA 80 and listed and labeled per requirements of authorities having jurisdiction.
- E. Safety Glazing Products: Comply with size, glazing type, location, and testing requirements of 16 CFR 1201 for Category I and II glazing products, and requirements of authorities having jurisdiction. Each pane of safety glazing and/ or tempered glass installed in hazardous locations shall be identified by a manufacturer's designation specifying who applied the designation, the manufacturer or installer and the safety glazing standard with which it complies. The designation shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that once applied, cannot be removed without being destroyed.
- F. Glazing Industry Publications: Comply with glass product manufacturers' recommendations and the following:



1. GANA Publications: GANA Laminated Division's 'Laminated Glass Design Guide' and GANA's 'Glazing Manual.'
  2. IGMA Publication for Insulating Glass: IGMA TM-3000, 'Glazing Guidelines for Sealed Insulating Glass Units.'
- G. Insulating-Glass Certification Program: Indicate compliance with requirements of Insulating Glass Certification Council on applicable glazing products.
- H. Mockups: Prior to installing glazing, build mockups to demonstrate materials and workmanship. Coordinate with mockup requirements of related sections.
- I. Preinstallation Conference: Conduct conference at Project site in compliance with Division 01 requirements.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials during shipping, handling, and storage to prevent breakage, scratching, damage to seals, or other visible damage. Deliver, unload, store, and erect glazing materials without exposing panels to damage from construction operations.
1. Comply with manufacturer's venting and sealing recommendations for shipping and handling of insulating glass units exposed to substantial altitude change.

## 1.9 WARRANTY

- A. Warranty for Coated-Glass Products: Manufacturer's standard form, signed by coated-glass product primary manufacturer or manufacturer/fabricator, as applicable, agreeing to replace coated-glass units that display peeling, cracking, and other deterioration in metallic coating under normal use, within 10 years of date of Substantial Completion.
- B. Warranty for Insulating Glass: Manufacturer's standard form, signed by insulating-glass product manufacturer/fabricator, agreeing to replace insulating-glass units that exhibit failure of hermetic seal under normal use evidenced by the obstruction of vision by dust, moisture, or film on interior surfaces of glass, within 10 years of date of Substantial Completion.
- C. Installer's Warranty: Form acceptable to Owner, signed by glass product Installer, agreeing to replace glass products that deteriorate, or that exhibit damage or deterioration of glass or glazing products due to faulty installation, within 2 years of date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis of Design: Glass product selections are based upon the primary glass manufacturer below. Provide basis of design product, or, subject to compliance with requirements, a comparable product of a listed manufacturer approved by the Architect prior to bid:
1. Vitro Architectural Glass, primary – Basis of Design.
  2. Oldcastle BuildingEnvelope.
  3. Guardian Industries.
  4. Pilkington.
  5. Pre-Approved Equal.

### 2.2 GLASS PRODUCTS

- A. Annealed Float Glass, General: ASTM C 1036, Type I, Quality-Q3, class indicated.
- B. Heat-Treated Float Glass, Heat-Strengthened: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; Kind HS, of class and condition indicated: where indicated, or where needed to resist thermal stresses and where required to comply with performance requirements.

- C. Heat-Treated Float Glass, Fully Tempered: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; Kind FT, of class and condition indicated: where safety glass is indicated. Safety glazing must comply with ANSI Z97.1 and CPSC 16CFR-1201
- D. Sputter-Coated Float Glass: ASTM C 1376, float glass with metallic-oxide or -nitride coating deposited by vacuum deposition process following primary glass product manufacture.
- E. Insulating-Glass Units: Factory-assembled units consisting of dual-sealed lites of glass separated by a dehydrated interspace, with manufacturer's standard spacer material and construction, per ASTM E 2190.

### 2.3 GLAZING ACCESSORIES

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Glazing Tape: Butyl-based elastomeric tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation, complying with ASTM C 1281 and AAMA 800 for application.
- C. Glazing Tape: Closed cell polyvinyl chloride foam, maximum water absorption by volume 2 percent, designed for 25 percent compression for air barrier and vapor retarder seal, black color, coiled on release paper over adhesive on two sides; widths required for specified installation, and complying with AAMA 800.
- D. Glazing Gaskets:
  1. Dense Compression Gaskets: ASTM C 864, neoprene or EPDM, or ASTM C 1115, silicone or thermoplastic polyolefin rubber, as recommended by glazing product manufacturer for application, molded or extruded shape to fit glazing channel retaining slot; black color.
  2. Soft Compression Gaskets: ASTM C 509, Type II, black, molded or extruded, neoprene, EPDM, silicone or thermoplastic polyolefin rubber, of profile and hardness required to maintain watertight seal.
- E. Setting Blocks: ASTM C 864, neoprene, 80 to 90 Shore A durometer hardness; length 4 inches, width of glazing rabbet space less 1/16 inch, height required for glazing method, pane weight, and pane area.
- F. Spacer Shims: ASTM C 864, neoprene, 50 to 60 Shore A durometer hardness; length 3 inches, one half height of glazing stop, thickness required for application, one face self-adhesive.
- G. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- H. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

### 2.4 FABRICATION OF GLAZING UNITS, GENERAL

- A. Fabricate glazing units in dimensions required, with edge and face clearances, edge and surface conditions, and bite in accordance with glazing product manufacturer/fabricator's instructions and referenced glazing publications.

### 2.5 SINGLE PANE GLAZING UNITS

- A. Clear float glass as manufactured by Vitro Architectural Glass
  - a. Conformance: ASTM C 1036, Type 1, Quality q3.
  - b. Heat-Treatment: For Safety Glazing, Tempered; ASTM C 1048, Kind FT; Safety Glazing meets ANSI Z97.1 Class B and CPSC 16CFR-1201.

## 2.6 INSULATING-GLASS UNIT(S)

- A. Double Glazed Tinted Solar Control Insulating Glass Unit - Solarban® 70XL on Solarblue® 1/4" (6mm) (2) Air 1/2" (12.7mm) | Clear 1/4" (6mm).
  - 1. Conformance: ASTM E 2190
  - 2. Outdoor Lite: Solarblue Tinted Float Glass as manufactured by Vitro Architectural Glass
    - a. Conformance: ASTM C 1036, Type 1, Class 2, Quality q3.
    - b. Glass Thickness: 6mm (1/4")
    - c. Magnetic Sputter Vacuum Deposition Coating (MSVD): ASTM C 1376.
    - d. Coating: Solarban® 70XL on Surface # 2
    - e. Heat-Treatment: For Safety Glazing, Tempered; ASTM C 1048, Kind FT; Safety Glazing meets ANSI Z97.1 and CPSC 16CFR-1201.
  - 3. Interspace Content: Air 1/2" (12.7mm)
  - 4. Indoor Lite: Clear float glass as manufactured by Vitro Architectural Glass
    - a. Conformance: ASTM C 1036, Type 1, Class 1, Quality q3.
    - b. Heat-Treatment: For Safety Glazing, Tempered; ASTM C 1048, Kind FT; Safety Glazing meets ANSI Z97.1 and CPSC 16CFR-1201.
    - c. Glass Thickness: 1/4" (6mm)
  - 5. Performance Requirements:
    - a. Visible Light Transmittance: 42 percent minimum.
    - b. Winter Nighttime U-Factor: 0.28 (Btu/hr\*ft<sup>2</sup>\*°F) maximum.
    - c. Summer daytime U-Factor: NA
    - d. Shading Coefficient: NA
    - e. Solar Heat Gain Coefficient: 0.23 maximum.
    - f. Outdoor Visible Light Reflectance: 8 percent maximum.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that glazing channels are clean and ready to accept glazing installation, and that weeps are unobstructed. Confirm that minimum required face and edge clearances will be maintained. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- B. Examine glazing units prior to setting. Reject units that display edge or face damage that may impede performance of unit or that will be visible when installed.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members to receive glass with recommended solvent and wipe dry. Apply primers to joint surfaces to ensure adhesion of sealants, unless preconstruction sealant-substrate testing indicates no primer is required.

### 3.3 GLAZING INSTALLATION

- A. General: Install glass and glazing materials in accordance with instructions of manufacturers and requirements of GANA Glazing Manual.
  - 1. Install setting blocks of size and in location required by glass manufacturer. Set blocks in bed of approved sealant.
  - 2. Provide spacers for glass lites as recommended, based upon size of glass unit.
  - 3. Comply with glass manufacturer's limits on edge pressures.
  - 4. Ensure that glazing units are set with proper and consistent orientation of glass units toward interior and exterior.
  - 5. Provide edge blocking where recommended.
  - 6. Install sealants in accordance with requirements of Division 07 Section 'Joint Sealants.' Verify compatibility of all sealants.

- B. Gasket Glazing: Fabricate gaskets to fit openings exactly. Allow for stretching of gaskets during installation.
  - 1. Set soft compression gasket against fixed stop or frame, secure, with bonded miter cut joints at corners.
  - 2. Set glass lites centered in openings on setting blocks.
  - 3. Install removable stops, and insert dense compression gaskets at corners, working toward centers of lites, compressing glass against soft compression gaskets and to produce a weathertight seal. Seal joints in gaskets. Allow gaskets to protrude past face of glazing stops.

#### 3.4 CLEANING AND PROTECTION

- A. Protect installed glass from damage. Attach streamers or warning tape to framing members, away from contact with glass. Remove nonpermanent labels.
- B. Protect glass from contact with contaminating substances during construction. Immediately clean glass exposed to contamination using methods recommended by glass manufacturer.
- C. Within 5 working days prior to inspection for Substantial Completion, clean all exposed glass surfaces using methods recommended by manufacturer. Remove glazing compounds from framing surfaces.
- D. Remove and replace broken or damaged glass.

END OF SECTION 08 81 23

## PART 1 - GENERAL

### 1.1 SUMMARY:

- A. This specification covers all labor, materials, equipment and services necessary to furnish and install gypsum wallboard, complete with related metal components, accessories and finish surfaces as indicated or specified.

### 1.2 QUALITY ASSURANCE

- A. Manufacturers - Wallboard components shall be as manufactured by U.S. Gypsum Company, National Gypsum Company, Georgia-Pacific, or pre-approved equal. It is intended that all materials furnished be a part of a single system, whether it be supplied by one or several manufacturers.
- B. GA-216, insofar as any portions are applicable, is hereby made a part of this Specification as though repeated herein. In case of conflicts, the more stringent requirements shall govern.

### 1.3 SUBMITTALS

- A. Test Reports - Submit copies of fire test report on fire rated wallboard assemblies. Submit copies of evidence of fire hazard classification for wallboard. Certified test reports of other acceptable testing agencies which perform testing in accordance with ASTM E-119/190, E-84 and E-90 are acceptable.
- B. Certificates - Furnish manufacturer's certification that materials meet or exceed Specification requirements.
- C. Manufacturer's Instructions - Furnish manufacturer's printed instructions for installation of assemblies.
- D. Samples - Provide sample of texture finishes for Architect's approval.

### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver wallboard materials in manufacturer's unopened containers, packages or bundles identified with manufacturer's name, brand, type and grade. Store inside dry areas and protect from dampness and deterioration. Protect ready-mixed products from freezing and protect metal accessories from rusting. Remove damaged or deteriorated materials from the premises.
- B. Deliver fire-rated materials bearing testing agency label and required fire classification number.

### 1.5 PROTECTION AND PREPARATION

- A. Temperature and Humidity Conditions - Do not install wallboard unless installation areas comply with the minimum temperature and ventilation requirements recommended by the manufacturer.
- B. Protection - Protect work installed by other trades previous to work under this Section. Replace any work damaged without added cost to the Owner. Provide closures for exterior openings, where required. Room temperature during installation of wallboard shall not be less than 50° F., with adequate ventilation maintained to eliminate excessive moisture until joint compound is completely dry. Protect wallboard from wetting. Replace any damaged material.
- C. Provide ventilation during and following adhesives and joint treatment applications. Use temporary air circulators in enclosed areas lacking natural ventilation. Under slow drying conditions, allow additional drying time between coats of joint treatment. Protect installed materials from drafts during hot, dry weather.

## PART 2 PRODUCT

### 2.1 MATERIALS

- A. MOLD-RESISTANT TYPE X GYPSUM BOARD: ASTM C1396/C1396M, Type X: Water-resistant gypsum wallboard and exterior gypsum soffit board.

1. Basis of Design: Subject to compliance with project requirements, the design is based on the following: USG Corporation, LLC, USG Sheetrock® Brand EcoSmart Panels Mold Tough® Firecode® X.
  2. ISO 14040 Environmental Management, Life Cycle Assessment, Principles and Framework:
    - a. Carbon emissions per Product Category Rules for North American Gypsum Boards; FPIInnovations – Gypsum PCR-2013: v1; Global Warming Potential of 268 kg CO<sub>2</sub> eq./1000 ft<sup>2</sup> for Western USA.
    - b. Water reduction per Product Category Rules for North American Gypsum Boards; FPIInnovations – Gypsum PCR-2013: v1 yields a net use of fresh water value of 1.35 m<sup>3</sup>/1000 ft<sup>2</sup> for Western USA.
  3. UL Type Designation “ULIX™”
  4. ASTM C1396; 5/8 in. Type X, water-resistant gypsum wallboard and exterior gypsum soffit board: complies.
  5. ASTM E136 Noncombustibility: Meets or exceeds criteria.
  6. ASTM E84 Surface-Burning Characteristics:
    - a. Flame Spread: 15.
    - b. Smoke Developed: 0.
    - c. Classification: Class A.
  7. ASTM C473:
    - a. Core Hardness: Meets or Exceeds 11 (ASTM C473 B)
    - b. Flexural Strength (lbf).
      - 1) Parallel: Not less than 46.
      - 2) Perpendicular: Not less than 147.
    - c. Nail Pull Resistance (lbf) ASTM C473 (B): Not less than 87.
  8. Thickness: 5/8 inch.
  9. Length: As required for one-piece installation from sill to top of wall.
  10. Widths: 48”.
  11. Weight: 1.85 lb./sq. ft.
  12. Long Edges: Tapered.
- C. Wallboard Accessories
1. Corner Bead Reinforcement - U.S. Gypsum Company or pre-approved equal.
  2. Metal Edge Reinforcement - U.S. Gypsum Company or pre-approved equal.
  3. Control Joint - U.S. Gypsum Company No. 093 or pre-approved equal.
- D. Screws
1. Self-drilling, self-tapping bugle head for use with power driven tool. Type W, non-corrosive, for application to wood framing, minimum 1-1/4" length (ASTM C-1002); type 9-12 for application to heavy gauge metal framing (ASTM C-646); 1-5/8" for double layer (ASTM C-894).
- E. Joint Treatment System
1. Joint tape shall be perforated, conforming to ASTM C-475 or FF SS-J-570, Type II.
  2. Joint compound shall be powdered or ready-mixed conforming ASTM C-475 or FS SS-J-570, Type I. Taping and topping joint compound or all purpose joint compound may be used.
- F. Texture Finish
1. Wall texture shall match the other adjacent areas within the building.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

#### A. Walls

1. All wood framing members to which gypsum wallboard will be fastened shall be straight, true and solid with no rot. Stud spacing shall be not greater than 24” o.c. Correct non-compliant conditions before proceeding with gypsum wallboard installation
2. Apply wallboard with long dimension at right angles to framing with all abutting ends and edges occurring over stud centers. Use wallboard of the maximum practical length to

minimize end joints. Neatly fit and stagger end joints. Arrange joints on opposite sides of the partitions as to occur on different studs. Cut wallboard neatly to fit around all openings. Wallboard to extend to within 1/4" of the floor.

2. Wherever wallboard terminates against dissimilar materials or where edges of wallboard are exposed, install metal edge reinforcement as specified. At all outside corners install metal corner bead reinforcement as specified.
  3. At locations indicated, install control joint over face of wallboard panels. Cut end joints square, butt together and align to provide neat fit. Attach control joint to wallboard with Bostitch 1/2" Type G staples or approved equal, spaced not over 6" on center in each flange.
  4. At studs, and when shear values are not required, apply wallboard using screws spaced a maximum of 8" o.c. along vertical ends or edges and intermediate supports. Fasteners shall be spaced not less than 3/8" from the ends and edges of the gypsum wallboard.
  5. Screws shall be driven so that the screw heads are at or slightly below the gypsum wallboard face paper without breaking the face paper or stripping the framing member around the screw shank.
  6. At double stud partitions, such as at chases, install strips of wallboard 12" wide and of length to span the partition depth by screwing to the webs of opposing studs. Space strips approximately 42" o.c.
  7. At double layer walls install base layer as specified above except install vertically over framing members. Install face layer with fasteners as noted and stagger joints in face layer. At all vertical corners, provide "floating" corner installation per USG Drywall Construction Handbook, 5th Edition.
  8. Provide perimeter relief where non load-bearing wallboard partitions abut structural decks or ceilings or vertical structural elements. Allow not less than 1/4", nor more than 1/2" gap between wallboard and structure. Finish edges of wallboard face layer with square-nose metal casing bead and caulk space between casing bead and structure with continuous sealant bead. Attach wallboard to studs not less than 1/2" below bottom edge of ceiling track flanges and to first stud adjacent to vertical tracks. Do not attach wallboard directly to tracks.
  9. Where wallboard partitions intersect masonry wall, provide control joint no less than 1/4", nor more than 3/8" wide between wallboard and masonry. Finish exposed edges of wallboard with square-nose metal casing bead and caulk space between casing bead and masonry with continuous sealant bead.
  10. Gypsum wallboard shall be properly flashed at openings and preferably located so that no joint will align with an edge of the opening. Joints shall be staggered. Gypsum wallboard shall be fitted snugly around all window and door openings.
  11. Holes and cutouts for plumbing penetrations, or other small openings, shall be sealed with water-resistant flexible sealant complying with ASTM C920 *Standard Specification for Elastomeric Joint Sealants, Type S, Grade NS, Class 25*.
- B. Finishing
1. Reinforce wall and ceiling angles and inside vertical corner angle with tape folded to conform to the adjoining surface and to form a straight, true angle. Apply a thin uniform layer of compound, approximately 3" wide, under and over the tape in the angle joint to be reinforced. Center tape over all joints to be reinforced and seal into the compound, having sufficient compound under the tape to provide proper bond. Apply a skim coat of compound immediately after embedding tape. Clean excess compound from the wallboard surface. After drying, cover embedding compounds with an additional coat of compound.
  2. Allow joints to dry thoroughly (minimum of 24 hours) between each application of compound.
  3. All joints shall have tape embedded, filled and finished using specified compound.
  4. Cover fill coat with compound spread evenly over and slightly beyond the tapered edge of the board, feathered at the edges, with a smooth uniform slight crown over the joint. All dimples at fastener heads shall receive three coats of compound in succession as used in joints.

5. Conceal flanges of all metal corner and edge reinforcing by at least two coats of compound. When completed, the compound shall extend approximately 8" to 10" on either side of the exposed metal nosing.
6. Sand all coats as necessary after each application of compound has dried. The final coat and subsequent sanding shall leave all wallboard and treated areas uniformly smooth and ready to receive decoration, to the extent that after painting of wallboard, there shall be no distinguishable difference in appearance between taped and untaped surfaces.
7. Apply an orange peel (or appropriate texture) wall texture to all exposed walls that are to receive a painted finish as scheduled. Surfaces shall be free of dust, dirt and oil before application. Mix material in a clean power mixer with water in the ratio of five gallons per 45 pound bag for a period of ten minutes. After mixing, add additional water to yield desired consistency. Use as heavy a mixture as practical and avoid over-thinning of the material. Apply material using spray equipment capable of developing sufficient pressure to produce a fine sand textured finish.

END SECTION 09 29 00



PART 1 GENERAL

1.1 SCOPE

- A. All labor, materials, equipment and services necessary to paint surfaces as shown or specified.

1.2 SPECIFIED MATERIALS AND SUBSTITUTIONS

- A. Comply with "Request for Approved Equal" in the "Special Terms and Conditions of the IFB".

1.3 SUBMITTALS

- A. Submittals required in accordance with Section 01 33 00.
- B. Submit Product Data on all materials to be used, including product information sheets listing chemical composition and percentage of total volume. Submit data indicating that paint products submitted are in compliance with current county, state, and federal V.O.C. regulations.
- C. Submit color charts and Samples for the Architect's and Owner's color selections.
- D. Submit six (6) 8-1/2 x 11 samples of each color and finish gloss selected by Architect and Owner.
- E. Submit a minimum 6' x 6' sample of each color and finish gloss selected by Architect and Owner on a location of Project selected by Architect.

1.4 PROJECT CLOSE-OUT

- A. See Section 01 77 00 for general Project Close-Out requirements.
- B. Submit manufacturer's or distributor's numbered and dated invoices showing type and quantity of products used on this Project.
- C. Provide Owner with complete information for future matching of all paint products and colors used on the Project.
- D. Provide Owner with (1) one-gallon can of each paint product and color used on the Project. The cans are to be unopened and product and color marked.

PART 2 MATERIALS

2.1 MANUFACTURERS

- A. The following manufactures are approved for this Project provided they match the specified products and comply with Federal and Local Regulations governing volatile organic compounds (VOC's). Colors will be selected from the full line of colors available from the paint manufacturer. Acceptable manufacturers are: Dunn Edwards, PPG, Sherwin Williams.
- B. Painting finishes schedule. Apply the following finishes to the surfaces specified (Dunn Edwards paints are scheduled as a basis of design, provide DE paints or approved equal):

<u>SUBSTRATE</u>	<u>PRIMER</u>	<u>FINISH</u>	<u>SHEEN</u>
<u>Ferrous metal</u>			
1 <sup>st</sup> Coat	(BRPROO) BLOC-RUST Premium		
2nd Coat		W 9 SYN-LUSTRO	Semi-gloss
3rd Coat		W 9 SYN-LUSTRO	Semi-gloss
<u>Galvanized metal</u>			
1 <sup>st</sup> Coat	(SC-ME01-1) Supreme Chemical Metal Clean & Etch		
2nd Coat	(ULGMOO) ULTRASHIELD Galvanized Metal Primer		
3rd Coat		(EVSH20-2) EVERSIELD	Velvet
4 <sup>th</sup> Coat		(EVSH20-2) EVERSIELD	Velvet
<u>Textured gypsum wallboard</u>			
1 <sup>st</sup> Coat	(VNPROO) VINYLASTIC Premium		
2nd Coat		(ASHL30) ARISTOSHIELD	Velvet
3rd Coat		(ASHL30) ARISTOSHIELD	Velvet
<u>Painted Wood</u>			
1st Coat	Unpainted – (EAPROO) EZ-PRIME Previously painted – (UGPROO) ULTRA-GRIP Premium		
2nd Coat		(EVSH20) EVERSIELD	Velvet
3rd Coat		(EVSH20) EVERSIELD	Velvet

### PART 3 INSTALLATION

- 3.1 Standards of Workmanship: Preparation, application, workmanship, completion, and acceptance shall be in accordance with this Specification, manufacturer's recommendations, and applicable provisions of the PCDA manual for "type 1 standard job".
- 3.2 Deliver paint to site in manufacturer's labeled and sealed containers. Labels shall give manufacturer's name, brand, type, batch number, color of paint and instructions for reducing. Thin only in accordance with printed directions of manufacturer. Job mixing or job tinting may be done when approved by the Architect.
- 3.3 Store materials used on the job in a single space. Such storage place shall be kept clean. Receive, store, handle and mix paint materials in this space. Make good any damage to it or to its surroundings. Remove any oily rags, waste, etc. from the building every night and take every precaution to avoid any danger of fire.
- 3.4 Inspection of Surfaces: Do not begin painting on any surface until it has been inspected and is in proper condition to receive the paint as specified. Should any surface be found unsuitable to provide a proper paint finish, notify the Architect in writing. Apply no material until the unsuitable surfaces have been made satisfactory. After acceptance of surface by application of first coat of paint, assume responsibility for and rectify any unsatisfactory finish resulting.
- 3.5 Steel and Iron: Remove grease, rust and rust scale and touch up any chipped or abraded places on items that have been shop coated. Where steel or iron have a heavy coating of scale, remove by descaling or wire brushing as necessary to produce a satisfactory surface for painting Prime welds if required.

- 3.6 Galvanized Metal: Thoroughly clean by wiping surfaces with solvent cleaner and conditioner before applying primer.
- 3.7 Do not apply exterior paint in damp, rainy weather, or until the surface has dried thoroughly from the effects of such weather. Do not apply varnish or paint when temperature is below 50 degrees F.
- 3.8 Stain or paint only when surfaces are clean, dry smooth and adequately protected from dampness. Each coat of paint shall be well brushed or rolled on, worked out evenly and allowed to dry at least 24 hours before the subsequent coat is applied.
- 3.9 Finished work shall be uniform of approved color, smooth and free from runs, sags, clogging or excessive flooding. Make edges of paint adjoining other materials or colors sharp and clean, without overlapping. Where high gloss enamel is used, lightly sand undercoats to obtain a smooth finish coat.
- 3.10 At completion, touch up and restore finish where damaged, and leave surfaces in good condition.

END OF SECTION 09 91 00

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exterior Coatings:
  - 1. Semi-transparent finish exterior coatings.
  - 2. ~~Solid hide finish exterior coatings.~~

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 Submittals.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
  - 4. Cleaning and maintenance instructions.
  - 5. Submit data indicating that products submitted are in compliance with current county, state, and federal V.O.C. regulations.
- C. Selection Samples: Submit two sets of samples showing available colors, textures, and finishes.
- D. Verification Samples: For each product specified, two samples, representing colors, textures, and finishes to be installed.

1.4 QUALITY ASSURANCE

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

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Store materials within absolute limits for temperature and humidity recommended by the manufacturer. Protect from damage.
- B. Store products in manufacturer's labeled packaging until ready for installation.

1.6 PROJECT CONDITIONS

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

environmental conditions outside manufacturer's absolute limits.

## 1.7 PROJECT CLOSE-OUT

- A. See Section 01 77 00 for general Project Close-Out requirements.
- B. Submit manufacturer's or distributor's numbered and dated invoices showing type and quantity of products used on this Project.
- C. Provide Owner with complete information for future matching of all stain and finishes products and colors used on the Project.
- D. Provide Owner with (1) one-gallon can of each stain and finish product and color used on the Project. The cans are to be unopened and product and color marked.

## 1.8 WARRANTY

- A. Warranty: Provide manufacturer's standard limited warranty for materials and workmanship.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer and Basis of Design: PPG ProLuxe Cetol; Wood Finishes.
  - 1. Subject to compliance with the requirements: Cabot, Okon.
- B. Requests for substitutions will be considered in accordance with provisions of the "Special Terms and Conditions of the IFB". Comply with "Request for Approved Equal."

### 2.2 COATING TYPES

- ~~A. Coating Type: Sikkens Rubbol Siding as manufactured by Sikkens Wood Finishes.
  - 1. Description: Protective coating.
  - 2. Composition: Hybrid alkyd/acrylic formula.
  - 3. Finish: Gloss.
  - 4. VOC Content: Less than 200 g/L.
  - 5. Tint Base:
    - a. Product Code: SIK56100.
      - 1) Color: 100 White.
    - b. Product Code: SIK56110.
      - 1) Color: 110 Light Tint Base.
    - c. Product Code: SIK56120.
      - 1) Color: 120 Medium Tint Base.
    - d. Product Code: SIK56140.
      - 1) Type: 140 Ultra Deep Tint Base.
  - 6. Product Code: SIK56\_\_\_\_.
    - a. Color: \_\_\_\_\_.
  - 7. Product Code: SIK56052.
    - a. Color: 052 Navajo Red.
  - 8. Product Code: SIK56058.
    - a. Color: 058 Oxford Brown.
  - 9. Product Code: SIK56201.
    - a. Color: 201 Chocolate Brown.
  - 10. Product Code: SIK56414.
    - a. Color: 414 Forest Green.~~
- B. Coating Type: Semi-Transparent Matte - ProLuxe Cetol SRD Semi-Transparent Exterior Wood Finish with Cetol Waterborne SRD Pigments.

1. Description: One-coat, exterior wood stain.
2. Tint Base Product Code: SIK500-190
3. Composition: Water based; contains manufacturer's UV absorbent additives.
4. Pigmentation: Cetol Waterborne SRD Pigments. Manufacturer's standard color "Oxford Brown."
5. VOC Content: Less than 100 g/L.

## 2.3 COATING APPLICATION AND SCHEDULE

- A. Application: Exterior coating systems.
1. Level of Transparency: Semi-transparent coatings.
    - a. System: Single coating of Cetol SRD Semi-Transparent Stain
  - ~~2. Solid Hide Finish Exterior Coatings:~~
    - ~~a. System: Sikkens Rubbol Siding.~~
    - ~~1) Number of Coats: \_\_\_\_\_.~~

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
- B. Do not proceed with installation until substrates have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

### 3.2 INSTALLATION

- A. Install in accordance with manufacturer's written instructions and recommendations, including the following:
1. Test moisture content of wood substrates to confirm it is within manufacturer's recommended limits for the coating type required.
  2. Remove hardware and similar items to allow continuous coverage to the greatest extent practical.
  3. Clean substrate of dirt, dust and other debris. Remove temporary markings and labels.
  4. Countersink nails if raised above the surface to be coated, fill holes.
  5. Apply to achieve uniform appearance, free of lap marks, bush marks, and other imperfections.

### 3.3 PROTECTION

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

END OF SECTION 09 93 00

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Section includes surface preparation and application of elastomeric coating to the following exterior substrates:
  - 1. Concrete.
  - 2. Concrete unit masonry (CMU).

### 1.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.
  - 1. Review preparation and installation procedures and coordinating and scheduling required with related work.
  - 2. Attendees to include:
    - a. Architect
    - b. Contractor
    - c. Installer
    - d. Manufacturer's Technical Representative
  - 3. Agenda:
    - a. Review schedule
    - b. Review substrates
    - c. Review locations

### 1.4 SUBSTITUTIONS

- A. Comply with "Request for Approved Equal" in the "Special Terms and Conditions of the IFB".
- B. Substitution requests shall include items A, B, G and H from Section 1.5 ACTION SUBMITTALS.

### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Provide Product Data, characteristics, accessories, etc.
  - 2. Indicate VOC content.

3. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- B. Samples for Initial Selection: For each type of elastomeric coating submitted for prior-approval.
  - C. Samples for Verification: For each type of elastomeric coating indicated and in each color and gloss.
    1. Submit Samples on same type of substrate as that to receive application, 8 inches square.
    2. Apply coats on Samples in steps to show each separate coat, including primers and block fillers as applicable.
    3. Label each coat of each Sample.
    4. Label each Sample for location and application area.
  - D. Manufacturer's Field Service Reports: Submit site reports on periodic visits indicating system observation before, during and after installation by manufacturer's authorized representative.
  - E. Pre-Installation Conference Report: Submit report verifying project site conditions and acceptance of mock-up panels prior to installation, including special manufacturer's instructions and requirements. Include review of protection plan for surrounding areas and adjacent surfaces with report
  - F. Product List: Cross-reference to paint system and locations of application areas. Include color designations.
  - G. Warranty: Manufacturer's Sample Warranty and letter indicating the Manufacturer's intent to warrant for this project.
  - H. Qualification Data: For Manufacturer and Applicator. Include Certification of Applicator by Manufacturer. See Section 1.7, QUALITY ASSURANCE.
  - I. Adhesion and RILEM Tube test results.

## 1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Maintenance Data: For users operation and maintenance of system including:
  1. Methods for maintaining system's materials and finishes.
  2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
- B. Furnish extra material, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Quantity: Furnish an additional **5** percent but not less than **1 gal.** of each material, color, and texture applied.

## 1.7 QUALITY ASSURANCE

- A. Qualifications



1. Materials shall be manufactured at a facility covered by a current ISO 9001:2008 and ISO 14001:2004 certification. Certification of the facility shall be done by a registrar accredited by the American National Standards Institute, Registrar Accreditation Board (ANSI-RAB).
  2. The applicator shall be knowledgeable in the application of exterior acrylic and elastomeric architectural coatings and have a minimum of 5 years of experience in application of specified products. The applicator shall be certified by the Manufacturer to apply the Manufacturer's elastomeric wall coating products and for his work to receive the Manufacturer's warranty.
- B. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Do not begin work until Mockups are approved.
1. Manufacturer to perform adhesion test in accordance with ASTM D3359, Method A. Minimum adhesion rating of 4A required on 0 to 5 scale. Testing to be done in an inconspicuous location.
  2. Manufacturer to conduct RILEM tube testing. Testing to be witnessed by Architect. Result to be presented to Owner.
  3. Architect will select one surface to represent surfaces and conditions for application of each paint system.
    - a. Vertical and Horizontal Surfaces: Provide samples of at least 50 sq. ft.
  4. Final approval of color selections will be based on mockups.
    - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
  5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  6. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Notify the Manufacturer's authorized representative at least two weeks before start of work. Schedule a minimum of 4 job site inspections by the Manufacturer's authorized representative, first scheduled before application of product.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 40 deg F or more than 100 deg F. Comply with all written requirements of Manufacturer for storage and handling of materials.
1. Maintain original, unopened containers with labels intact and in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.

## 1.9 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 40 and 100 deg F unless otherwise permitted by manufacturer's written instructions.

- B. Do not apply coatings in rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before starting or continuing coating operation.
- D. Comply with manufacturer's written requirements regarding Protection, Sequencing and Scheduling.

#### 1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace elastomeric coatings that fail within specified warranty period with any material or labor supplied at no cost to the Owner.
  - 1. Failures include, but are not limited to, the following:
    - a. Water penetration through the coating.
    - b. Deterioration of coating beyond normal weathering.
  - 2. Warranty Period: 10 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. The Elastomeric Coating System and the Exterior Insulation Finish System shall be manufactured and provided by the same Manufacturer for compatibility of components and consistency.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Dryvit Systems, Inc.; Weatherlastic Smooth.
- C. Substitutions: Alternate to acceptable manufacturer will be considered only on basis of written requests. Submit substantiation of product performance as listed in section 2.2 below. Comply with "Request for Approved Equal" in the "Special Terms and Conditions of the IFB"

#### 2.2 MATERIALS

- A. Performance Requirements
  - 1. The Weatherlastic Smooth coating shall meet or exceed the following tests.
    - a. Water Vapor Transmission (ASTM E 96 Water Method) - 15 perms at 10 mils dry film thickness.
    - b. Accelerated Weathering (ASTM G 26 Test Method 1, BH Apparatus)
      - 1) After 3,000 hours exposure, the coating shall exhibit as a minimum:
        - a) Chalking index of 9 per ASTM D 4214-89 Method B
        - b) Checking index of 10 per ASTM D 660-93
        - c) Cracking index of 10 per ASTM D 661-93
        - d) Blistering index of 10 per ASTM D 714-87
        - e) Erosion index of 9 per ASTM D 662-93

- f) Rusting index of 10 per ASTM D 610-85
- c. Salt Spray (Fog) Resistance (ASTM B 117-90)
  - 1) After 500 hours exposure, the coating shall exhibit as a minimum:
    - a) Chalking index of 10 per ASTM D 4214-89 Method B
    - b) Checking index of 10 per ASTM D 660-93
    - c) Cracking index of 10 per ASTM D 661-93
    - d) Blistering index of 10 per ASTM D 714-87
    - e) Erosion index of 10 per ASTM D 662-93
    - f) Rusting index of 10 per ASTM D 610-85
- d. Hardness (ASTM C 661-85) Type A Shore Durometer; 69.5 @ 20 mils DFT
- e. Impact Resistance (ASTM D 2794); 98 in-lbs.
- f. Resistance to Wind Driven Rain (Federal Test Method TT-C-555B) - Passes
- g. Low-Temperature Flexibility; 1/8 in (3.2 mm) diameter mandrel at -30 °F (-34 °C). No cracking or adhesion loss (Evaluated per ASTM D 522-88).
- h. Tensile Properties (ASTM D 2370-92):
  - 1) Tensile Strength - 100 psi @ 77 °F (25 °C) 488 psi @ - 0 °F (18 °C)
  - 2) Elongation - 77% @ 77 °F (25 °C) 123% @ -0 °F (18 °C)

B. Material Compatibility:

- 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. For each coat in a coating system, products shall be recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- 3. Obtain each type of elastomeric coating including associated accessories through one source from a single manufacturer.

C. Colors: As selected by Architect from manufacturer's full range.

D. Crack Fillers: Elastomeric coating manufacturer's recommended, factory-formulated crack fillers or sealants, including crack filler primers, compatible with substrate and other materials indicated.

E. Primer: Elastomeric coating manufacturer's recommended, factory-formulated, alkali-resistant primer compatible with substrate and other materials indicated.

- 1. Basis of Design: Weatherprime Acrylic Primer, a pigmented, exterior, acrylic emulsion primer.

F. Concrete Unit Masonry Block Filler: Elastomeric coating manufacturer's recommended, factory-formulated, high-performance latex block filler compatible with substrate and other materials indicated.

G. Cementitious Repair Material:

- 1. Quickrete Mason Mix, Product No. 1136

H. Bonding Adhesive:

- 1. Quickrete Bonding Adhesive, Product No. 9902

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator and Manufacturer's Representative present, for compliance with manufacturer's requirements including, but not limited to, maximum moisture content, alkalinity, and other conditions affecting performance of work.
- B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- C. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and coating systems indicated.
- B. Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
  - 1. After completing coating operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
  - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.
  - 2. Perform cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.
- D. CMU and Concrete Substrate Repair:
  - 1. Repair per manufacturer's recommendations if they differ from those below.
  - 2. Inspect all wall areas, identify and mark all repair areas in existing substrate.
  - 3. Prepare an example of the repair methods described below for review and approval by the Manufacturer and Architect prior to undertaking work.
  - 4. Use mechanical abrasion/ wire wheel and wire brush to remove all loose paint and punky mortar.
  - 5. For mortar joint and cementitious surface repairs, prime area with Bonding Adhesive and repair with Mason Mix. Use wet brush to smooth repair areas and blend. Prime repaired surface.
- E. Crack Repair: Fill cracks according to manufacturer's written instructions before coating surfaces.
- F. Through Wall Penetrations:

1. Inspect all through wall penetrations, including electrical, lighting, signage, plumbing, HVAC and fire protection.
2. Repair all deficiencies with approved, compatible sealant for a watertight installation.

### 3.3 APPLICATION

- A. Apply elastomeric coatings according to manufacturer's written instructions.
  1. Use equipment and techniques best suited for substrate and type of material being applied.
  2. Coat surfaces behind movable items the same as similar exposed surfaces.
  3. Apply each coat separately according to manufacturer's written instructions.
- B. Primers: Apply at a rate to ensure complete coverage.
- C. Block Fillers: Apply at a rate to ensure complete coverage with pores filled.
- D. Elastomeric Finish Coat(s): Minimum two coats with a minimum total dry film thickness of 16 mils or Manufacturer's recommended total dry film thickness to achieve warranty requirements **if** such recommendation exceeds 16 mils.
- E. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats similar to color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- F. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform finish, color, and appearance.
- G. Apply coatings 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.
- H. Apply coatings to prepared surfaces as soon as practicable after preparation and before subsequent surface soiling or deterioration.
- I. Spray Application: Use spray equipment for application only when permitted by authorities having jurisdiction and Owner. Wherever spray application is used, do not double back with spray equipment to build up film thickness of two coats in one pass.

### 3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following testing procedures:
  1. Owner will engage the services of a qualified testing agency to sample materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
  2. Testing agency will perform tests for compliance of materials with product requirements.
  3. Owner may direct Contractor to stop coating application if test results show materials being used do not comply with requirements. Remove noncomplying materials from Project site, pay for testing, and recoat surfaces that were coated with rejected materials. Remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

- B. Field Testing and Inspection:
1. Owner may engage the services of a qualified testing agency to verify installed thickness and water resistance of the elastomeric coatings.
  2. Provide manufacturer's field service consisting of periodic site visits by manufacturer's representative for observation of coating system application including the following as a minimum:
    - a. Preinstallation meeting
    - b. Review and approval of substrate preparation
      - 1) Field adhesion testing (Pull Test)
    - c. Review of crack repair methods
    - d. Review of mock up
  3. The Owner may complete or duplicate recommended testing required by the manufacturer at completion of work to ensure warranty requirements and contract compliance are met.
- C. Field-Adhesion Testing:
1. Document and perform field-adhesion testing in accordance with manufacturer's recommended field-adhesion testing requirements to qualify for coating manufacturer's specified warranty program.
  2. Inspect and note the percent cohesive failure (percent of coating material left on the wall surface).
    - a. At least 80 percent of the coating should remain on the wall surface. If this is not achieved, clean wall surface again and retest.
- D. Final inspection: RILEM Tube Testing is to be conducted by Manufacturer and witnessed by the Architect once the final application has been fully cured. Result to be presented to Owner.
- E. Warranty Request: Manufacturer's representative will inspect finished surface preparation, application and finished coating and may require further preparation or application to achieve appropriate result. In no case will manufacturer's representative approve surface or finish if any of the following conditions are found: excessive pinholes, insufficient coating thickness, loose paint, paint with curled edges, crack treatments with loose edges, loose stucco (to be determined by sounding method), or any other condition, which, in manufacturer's representative's opinion, may cause failure of installation. Warranty applications require a minimum 15 mils film thickness.

### 3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site and properly dispose.
- B. Immediately remove over-spray coating from areas that were not to be coated.
- C. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- D. Protect work of other trades against damage from coating application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

- E. At completion of construction activities, touch up and restore damaged or defaced coated surfaces. Remove temporary coverings and protection of adjacent work areas.

### 3.6 ELASTOMERIC COATING SCHEDULE

#### A. Concrete Substrates:

##### 1. Elastomeric Coating System

- a. Prime Coat
- b. Intermediate Elastomeric Coat
- c. Elastomeric Topcoat

#### B. Concrete Unit Masonry (CMU) Substrates:

- a. Block Filler
- b. Intermediate Elastomeric Coat
- c. Elastomeric Topcoat

END OF SECTION 09 96 53