

ADDENDUM NO. 1

DATE: October 5, 2018

FROM: Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, IL 60062
Patrick Shaughnessy
tel. 847-753-6466

TO: PROSPECTIVE BIDDERS

SUBJECT: ADDENDUM NO. 1 TO THE BIDDING DOCUMENTS FOR:

ROOF REPLACEMENT - TRIPHAHN CENTER

WJE NO.: 2018.0772

CONTRACTS: GENERAL

This addendum forms a part of the bidding and contract documents and modifies the original bidding documents dated September 17, 2018.

NOTE: THIS ADDENDUM MODIFIES THE BID FORM AND INCLUDES A NEW BID FORM TO BE USED WHEN SUBMITTING BIDS. FAILURE TO USE THE NEW BID FORM MAY DISQUALIFY BIDDER.

The following is a summary of the changes in this Addendum. The complete description of changes are shown in the attached bid form and documents.

BID FORM (ALL BIDDERS MUST USE THE REVISED BID FORM)

1. BID DUE DATE
 - a. The bid due date has been set for 10:00 AM local time on Wednesday October 10, 2018.
2. ADDENDA
 - a. Addenda No. "1" Dated "October 5, 2018"
3. LUMP SUM PORTION OF BID
 - a. Added L4 to include flush seam metal wall panels as a break-out item to Base Bid
4. UNIT PRICE PORTION OF BASE BID
 - a. Added U4, U5, and U6.

SPECIFICATION SECTION 07 42 13 - FORMED METAL WALL PANELS

1. GENERAL
 - a. Removed extraneous comments and notes regarding document formatting.
2. THERMAL SPACERS / CLIPS

- a. Added 2.3, A., fiberglass girt clip to specifications.

3. INSULATION

- a. Added 2.3, C., 2 inch mineral wool insulation to wall system.
- b. Added 3.2, B. mineral wool insulation installation.

ALTERNATE 2 - SECTION 07 54 00 - ADHERED PVC ROOFING

1. ATTACHMENT COMPONENTS

- a. Substituted Low VOC adhesive for standard adhesive in 2.5, B.

ALTERNATE 1 - SECTION 07 54 19 - SIMULATED STANDING SEAM PVC ROOFING

1. GENERAL

- a. Removed extraneous comments and notes regarding document formatting.

2. PVC ROOFING

- a. Included ASTM D4434/ D4434M designation.

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

1. Added "interior trim sections" to 2.1, A.

SECTION 08 45 23 - TRANSLUCENT WALL AND ROOF PANELS

1. Added engineering calculations for translucent wall and roof panels in Paragraphs 1.2, E. and 1.4, A., 1.
2. Added wording to 2.2, A., 4 regarding bottom 5 feet of wall panels being opaque.
3. Color of translucent panel trim to be approved by owner prior to ordering of material added to 2.2, A., 4.
4. All vertical and head joints to be wet sealed with silicone sealant added to 3.3, C.

DRAWINGS

1. Detail 1/A-5.0 - Where the typical translucent skylight sill (Detail 2/A-5.0) meets the skylight sill at the head of the translucent wall panels (Detail 1/A-5.0), an offset occurs in the flashing system. The underlayment membrane and prefinished metal closure are to be continuous at this offset and form a fully sealed flashing pan that is integrated around the offset. The translucent panel flashing (by the panel manufacturer) and sealant (with weeps) are to extend continuously around the offset to conceal the flashing and underlayment below.

ADDITIONAL CLARIFICATIONS

1. **Question:** The roof is specified to be 24 ga. pre-finished and Berridge is the only one that has a panel that meets the UL90 rating from what I have been told. The flush seam panels are specified at .040 pre-finished aluminum. Berridge does not carry any aluminum product. If the flush panel has to be aluminum then we will have to go to another manufacture for that product. Just wondering if that can also be 24 ga. to match the roof.
Reply: In the interest of keeping with a single warranty, it will be acceptable to substitute a 24 gauge galvanized panel in lieu of the specified aluminum. All cuts are to be touched up with paint to match the panel finish. Submit product information.

2. **Question:** The area of roof on the West side of the building that ties into the existing building. I was told this was to be a flat lock panel. I would like to keep this a batten seam panel like the rest of the roof.
Reply: A batten seam panel at the cricket will be accepted.
3. **Question:** The snow bar that is specified will put exposed fasteners through the flat pan of the metal roof and that is not recommended. Can we look at another option for that?
4. **Reply:** The specified snow bar is the preferred material for the project as there are no known non-penetrating systems available for batten seam roof panels. Equivalents will be considered. Any restriction in the thermal movements in the standing seam panels caused by the snow bar is to be considered in the panel system design.

ATTACHMENTS

1. Revised Bid Form
2. Revised Section 07 42 13 Formed Metal Wall Panels
3. Revised Section 07 54 00 Adhered PVC roofing
4. Revised Section 07 54 19 Simulated Standing Seam PVC Roofing
5. Revised Section 07 62 00 Sheet Metal Flashing
6. Revised Section 08 45 23 Translucent Wall and Roof Panels
7. Sheet A-5.0

Very truly yours,

WISS, JANNEY, ELSTNER ASSOCIATES, INC.

This addendum consists of three (3) pages and attachments.

SECTION 00 41 44

BID FORM

BID FOR: **Roofing and Translucent Panel Replacement at
Triphahn Center
1685 West Higgins Road
Hoffman Estates, Illinois**

BID FROM: _____
(Bidder's Name)

(Bidder's Address)

Date: _____, 2018

The undersigned acknowledges receipt of:

- A. Project Manual and Drawings for Roofing Replacement at
Hoffman Estates Park District - Triphahn Center
1685 West Higgins Road
Hoffman Estates, Illinois 60169
Dated: September 17, 2018

- B. Addenda: No. 1 Dated: October 5, 2018
 No. _____ Dated: _____
 No. _____ Dated: _____

- C. Has examined the site and all Bidding Documents and agrees:

1. To hold these Bids open until 30 calendar days after Bid Opening Date.
2. To execute a satisfactory Agreement between Owner and Contractor within ten (10) days after notice of award.
3. To accept the provisions of the Bidding Instructions.

- D. As part of the Base Bid the Bidder agrees to:

1. Provide all necessary scaffolding and staging.
2. Provide all necessary protection for public safety.
3. Provide all necessary protection of the building and property (i.e., windows, landscaping).
4. Clean all areas affected by the Work.
5. Proposes to accomplish all Work in accordance with the Contract Documents for the bid prices as outlined in the following sections.

LUMP SUM PORTION OF BASE BID

Item	Type of Work	Total Bid
L1.	Access and general conditions (including costs for performance bond, payment bond, all necessary permits, access, sidewalk protection, etc.)	\$ _____
L2.	Removal of existing metal roofing system and flashings as shown in the drawings and installation of new 24 gauge metal roof panels and associated sheet metal flashings.	\$ _____
L3.	Removal of existing translucent fiberglass panel skylights and wall panels and installation of new translucent fiberglass panels.	\$ _____
L4.	<i>Removal of existing batten seam metal wall panels and installation of new rigid insulation and flush seam metal wall panels.</i>	\$ _____

ALTERNATES

Item	Type of Work	Total Bid
A1.	Access and general conditions for the installation of Item A2 (including costs for performance bond, payment bond, all necessary permits, access, sidewalk protection, etc.)	\$ _____
A2.	Alternate 1 - Removal of existing metal roofing system and flashings as shown in the drawings and installation of a PVC roofing membrane with simulated standing seams in lieu of item L2 above.	\$ _____
A3.	Access and general conditions for the installation of Item A4 (including costs for performance bond, payment bond, all necessary permits, access, sidewalk protection, etc.)	\$ _____
A4.	Alternate 2 - Removal of existing PVC roofing system and flashings as shown in the drawings and installation of a new PVC roofing membrane and associated flashing.	\$ _____

UNIT PRICE PORTION OF BASE BID

UNIT PRICES: The following Unit Prices shall govern for the Base Bid and any deviations from the quantities listed in the Base Bid. Unit Prices will be applied for additional locations indicated by A/E in the field. Included in the Unit Prices shall be all labor, materials, tools, equipment, overhead and profit, for both General Contractor and involved Subcontractors, required to do the work.

Item	Type of Work	Cost
U1.	Remove and replace deteriorated wood blocking that is encountered during demolition.	\$ _____ Per ft - each 2" x 4" inch layer
U2.	Remove and replace deteriorated wood blocking that is encountered during demolition.	\$ _____ Per ft - each 2" x 6" inch layer

U3.	Remove and replace deteriorated 3" polyisocyanurate insulation discovered upon removal of metal panels.	\$ _____ Per sf
U4.	<i>Cost to install 4 inch deep by up to 10 feet long steel sister stud reinforcement at diagonal brace behind translucent wall panels. Anchor to existing top and bottom tracks.</i>	\$ _____ per stud.
U5.	<i>Remove and replace deteriorated steel decking</i>	\$ _____ per sf
U6	<i>Scrape, clean, and coat corroded steel decking with rust inhibitive primer</i>	\$ _____ per sf

SUMMARY PORTION OF BID

Bid Total (Sum of Subtotals L1 through L4): \$ _____

Bid Total (in words): _____

_____ Dollars

TIME AND MATERIAL: To address changes in the work not indicated by the scope of work and upon written instruction of the Owner, the following prices shall prevail in accordance with the General Conditions.

LABOR COSTS: All trades at their prevailing hourly rate plus _____ percent (_____ %) for profit and overhead. Attach rate schedule.

MATERIAL COSTS: At cost plus _____ percent (_____ %) for profit and overhead.

CONSTRUCTION SCHEDULE

The Contractor agrees to commence work under the Contract on or before a date to be specified in a written "Notice to Proceed." It is anticipated that this project will begin in the spring of 2019. The Contractor proposes to complete all work within _____ calendar days (barring inclement weather and unsolvable material delays) from the date specified in the Notice to Proceed.

Failure to substantially complete the work during the Construction Time period stated above, plus any adjustments authorized by the Owner in writing, will be considered a substantial violation of the Contract.

The selected Contractor shall submit a detailed construction/work sequence schedule describing the work to be performed on an event by event basis, together with an estimate of time necessary to complete each phase of the Project.

IN SUBMITTING THIS BID, IT IS UNDERSTOOD THAT THE RIGHT IS RESERVED BY SAID OWNER TO REJECT ANY AND ALL BIDS, AND IT IS AGREED THAT THIS MAY NOT BE WITHDRAWN FOR A PERIOD OF THIRTY (30) DAYS FROM THE OPENING THEREOF.

SUBCONTRACTORS

List all subcontractors:

(This form may be copied for use in providing additional subcontractors.)

Contact: _____

Company: _____

Building: _____

Address: _____

Phone: _____

Scope of Work: _____

Contact: _____

Company: _____

Building: _____

Address: _____

Phone: _____

Scope of Work: _____

BIDDER'S RESUME

List minimum of three jobs of similar type and scope performed in the last five years:

Project 1

Owner: _____

Building: _____

Address: _____

Phone: _____

Architect/Engineer: _____

Scope of Work: _____

Contract Dollar Amount: _____

Project 2

Owner: _____

Building: _____

Address: _____

Phone: _____

Architect/Engineer: _____

Scope of Work: _____

Contract Dollar Amount: _____

Project 3

Owner: _____

Building: _____

Address: _____

Phone: _____

Architect/Engineer: _____

Scope of Work: _____

Contract Dollar Amount: _____

BIDDER'S ENDORSEMENT

The undersigned certifies that this proposal has been prepared under his personal supervision with his full knowledge.

Date _____

Firm Name _____

By _____
(Printed name of Corporation officer, Partner or sole Owner signing Proposal)

(Signature)

(Title)

Business Address _____

Telephone _____

Attached: Bid Form Attachment 1 - Form of Proposal

END OF SECTION

SECTION 07 42 13
FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Concealed-fastener, lap-seam metal wall panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 1. Wind Loads: 120 psf.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F , ambient; 180 deg F.
- C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

- A. General: Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. Flush-Profile, Concealed-Fastener Metal Wall Panels: Formed with vertical panel edges and a flat pan between panel edges; with flush joint between panels.
 1. Manufacturer:
 - a. Berridge Manufacturing Company
 - b. PAC-CLAD; Petersen Aluminum Corporation
 - c. Or approved equal.
 2. Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 - a. Thickness: 0.040 inch.
 - b. Exterior Finish: Three-coat fluoropolymer.
 - c. Color: As selected by Architect from manufacturer's full range.
 3. Panel Coverage: 12 inches.

4. Panel Height: 1.0 inch.

2.3 MISCELLANEOUS MATERIALS

- A. ***Sub-framing Thermal Spacer / Thermal Clip: 100% Pultruded glass fiber and thermoset polyester resin insulation clip***
 1. ***Thermal Spacer thickness for top, base and web: 3/16 inches nominal.***
 2. ***Thermal spacer depth: 2 inches nominal.***
 3. ***Basis of Design: Cascadia Windows Inc., Cascadia Clip***
 4. ***Spacer Fasteners: High hex head washer head with sharp twin lead threaded design of heat treated corrosion resistant coated steel***
- B. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- C. Mineral Wool Insulation
 1. Non-combustible, lightweight, water repellent, rigid insulation board with rigid upper surface to ASTM C612 Type IVB.
 2. Thickness: 2.0 inches
 3. Acceptable Material: Rockwool Cavityrock or equivalent.
 4. Accessories:
 - a. Mechanical fasteners in accordance with insulation manufacturer's written recommendations.
 - b. Insulation Clips: in accordance with manufacturer's written recommendations
- D. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- E. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- F. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

- G. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/2 inch wide and 1/8 inch thick.
 2. Joint Sealant: ASTM C 920; as recommended in writing by metal panel manufacturer.
 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.4 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

2.5 FINISHES

- A. Panels and Accessories:
1. Three-Coat Fluoropolymer: Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.
 2. Concealed Finish: White or light-colored acrylic or polyester backer finish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.2 METAL PANEL INSTALLATION

- A. Sub-framing Thermal Spacer / Thermal Clip Installation: Install thermal spacers in accordance with spacer manufacturer's written recommendations.
- B. Insulation Installation:
 - 1. Friction fit insulation in place before completing installation of remaining screws to secure Z-girt and thermal spacers.
 - 2. Ensure insulation is tightly fitted with sides of insulation slightly compressed at each insulation spacer.
 - 3. Ensure insulation pieces are in contact with no linear gaps between spacers.
- C. Flush-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
 - 1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
 - 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
 - 3. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
 - 4. Flash and seal panels with weather closures at perimeter of all openings.
- D. Watertight Installation:
 - 1. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.
 - 2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
- E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

3.3 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

END OF SECTION 07 42 13

SECTION 07 54 00

ALTERNATE 2 - ADHERED PVC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Scope: Fully adhered PVC single-ply membrane roofing, insulation, membrane and metal flashings, and supplementary items necessary to complete the installation.

1.2 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 for definitions of terms related to roofing work not otherwise defined in this Section.

1.3 PERFORMANCE REQUIREMENTS

- A. General: install watertight, thermoplastic single-ply membrane roofing, assembly arrangements as indicated, and flashing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.
- B. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing agency to resist uplift pressure calculated according to ASCE/SEI 7.
- C. Contract Documents
 - 1. Drawings and Specifications are an outline of criteria and performance requirements for PVC single-ply membrane roofing and flashing, and shall not be construed as engineered design. Requirements specified or indicated by details are intended to establish basic aspects of the system, dimensions of module and components, and profiles of members.
 - 2. Drawings and Specifications do not necessarily indicate or describe total work required for completion of Work, and may not cover some conditions which may be required.
- D. Wind Design: Provide single-ply membrane roofing that withstands wind loading acting upward on the roof, and is in compliance with the following:
 - 1. FMG Windstorm Classification 1-75.

1.4 SUBMITTALS

- A. Approval Prior to Submission: Obtain approval of submittals from independent inspection agency, as specified in the "Quality Assurance" and "Field Quality Control" Articles below, prior to submission to the Consultant.
- B. Manufacturer's Project Acceptance Document: Submit certification that manufacturer and installer will warrant roofing system for the specific site, design, details and application indicated for this Project.

- C. Product Data: Submit manufacture's technical product information, including installation instructions and recommendations for each roofing product required.
 - 1. Include fire classification compliance data.
 - 2. Include wind uplift resistance data.
 - 3. Include data substantiating that materials comply with requirements.
- D. Shop Drawings for Roof Membrane: Submit fully detailed and dimensioned plans, sections, details, and attachments to and relationships with other work, including, but not limited to, the following:
 - 1. Roof insulation layers, laps, joints, slopes, thicknesses, crickets and saddles; including fastening device types, spacings and locations; distinguish between field, perimeter and corner attachment requirements.
 - 2. Membrane material courses, laps, and terminations; distinguish between field, perimeter and corner attachment requirements.
- E. Shop Drawings for Flashings:
 - 1. Submit for each metal and membrane flashing item showing interface and relationship to adjacent materials, layout, profiles, methods of joining, and anchorage details.
 - 2. Include details for conditions not indicated, but anticipated due to work by others penetrating, attaching to, bearing on, or otherwise interfacing with the roofing membrane or associated flashings.
- F. Warranty: Submit sample copy of proposed manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.
- G. Insulation Certification: Submit certification from manufacturer that roof insulation proposed is compatible with roof membrane, and is approved by for coverage under warranty.
- H. Installer Certification: Submit certification from manufacturer certifying that installer is approved to install specified roofing system.
- I. Product Test Reports: Submit reports from independent testing agency evidencing that manufacturers roofing products are in compliance with requirements indicated on basis of comprehensive testing of the manufacturers corresponding system within last 3 years of system's current production by manufacturer.
- J. Installer's Qualifications: Submit data for firm and principal personnel specified in the 'Quality Assurance' Article below to demonstrate their capabilities and experience. Include lists of projects completed within the previous 10 years, similar in scope of this Project, with project names and addresses, names and addresses of owners and architects, and data describing the work performed on the project.
- K. Field Quality Control Test Reports:
 - 1. Manufacturers Field Reports: Submit detailed reports made by representatives of the manufacturer as specified in the "Field Quality Control" Article below.
 - 2. Maintenance Instructions: For inclusion in operation and maintenance manual required by Division 1, submit manufacturer's instructions for maintenance of installed work, including methods and frequency for maintaining optimum condition under anticipated use. Include precautions against cleaning materials and methods which may be detrimental to finishes

and performance. Include name, address, and telephone number of manufacturer's nearest authorized service representative.

1.5 QUALITY ASSURANCE

- A. Material Requirements:
- B. Compatibility: Provide materials that are compatible with one another under conditions of service and application required, as demonstrated by manufacturer based on testing and field experience.
- C. Single Source Responsibility: Obtain primary roofing materials of each type required from single manufacturer to the greatest extent possible. Provide secondary materials only as recommended by manufacturer of primary materials.
- D. Installer Qualifications:
 - 1. Experience:
 - a. Installer shall be experienced in performing roofing and flashing work, and shall have specialized training and/or experience in installing thermoplastic single-ply membrane roofing similar to that required for this Project.
 - b. Installer shall have completed at least one installation of not less than 10,000 square feet using same roofing system products within 6 months of original date of this specification.
 - 2. Acceptance: Installer shall be acceptable, approved or certified by the membrane manufacturer.
 - 3. Supervision: Installer shall maintain a full-time supervisor/foreman for each major area of work, who is on job site during times that roofing work is in progress, who is experienced in installing roofing systems similar to type and scope required for this Project, and is not performing actual installation work.
 - 4. Manufacturer Training: Technical representatives of the membrane manufacturer shall train the installer's installation personnel (supervisor and installers), at the Project, and shall cover the following:
 - a. Proper installation of the products, materials and components, including review of general roofing Instructions as well as instructions for this specific Project.
 - b. Work that will be necessary for conditions that will be concealed within the roofing membrane assembly or other construction.
 - c. Proper sequence of application of the system components.
 - d. Situations that require special attention or care during application.
 - e. Situations and conditions that should be avoided.
 - f. Other topics relevant to installation on this Project.
 - 5. Manufacturers Technical Representative Qualifications: Direct employee of technical services department of manufacturer with minimum of 5 years' experience in providing recommendations, observations, evaluations, and problem diagnostics. Sales representatives are not acceptable.
- E. Insurance Certification: If requested, assist Owner in preparing and submitting roof installation acceptance certification as necessary in connection with fire and extended-coverage insurance on roofing and associated work.
- F. Quality Standards:

WJE No. 2018.0772

September 17, 2018

Addendum No. 1 - October 5, 2018

Hoffman Estates Park District-Triphahn Center

Hoffman Estates, Illinois

1. Unless otherwise recommended by manufacturer, provide PVC single-ply membrane roofing in accordance with recommendations of the NRCA - "The NRCA Roofing Manual: Membrane Roof Systems-2015", for roofing type indicated.
 2. Comply with FM System Loss Prevention Data Standard 1-49 for attachment and anchorage of nailers, blocking, and other associated members.
 3. Comply with FM System Loss Prevention Data Standards 1-28 and 1-28s for attachment and anchorage of roof insulation to plywood decking
 4. Comply with recommendations of the following for flashings:
 - a. SMACNA - "Architectural Sheet Metal Manual," Seventh Edition, 2012.
 - b. NRCA - "The NRCA Roofing Manual: Membrane Roof Systems-2015".
- G. Fire-Resistance Characteristics:
1. Provide roofing membrane materials and construction that are identical to assemblies tested for fire resistance according to ASTM E 108NL 790 by an independent testing and inspecting agency acceptable to authorities having jurisdiction, and are listed for Class A external fire exposure.
 2. Provide materials bearing manufacturer's markings indicating that materials have been produced under UL's Classification and Follow-up Service.
- H. Pre-installation Conference: Before installing roofing system, conduct conference at Project site.
1. Meet with Owner, Consultant, Installer, manufacturer's technical representative and representatives of other entities directly concerned with performance of roofing work including (as applicable) Owner's insurers agency.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and attachment to structural members.
 4. Review loading limitations of deck during and after roofing.
 5. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
 6. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.
 7. Review temporary protection requirements for roofing system during and after installation.
 8. Review roof observation and repair procedures after roofing installation.
 9. Contractor shall record discussions of conference, including decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

1.6 DELIVERY, STORAGE AND HANDLING

- A. General: Deliver, store and handle roofing products and materials according to manufacturer's instructions, including protection from damage caused by water and/or moisture.
- B. Delivery: Deliver products and materials in manufacturer's original, unopened containers or wrappings with labels intact and legible. Labels shall bear manufacturer's information, date of manufacture, product description and numbers, and compliance within specified standards.

- C. Storage: Store and protect products and materials from weather; keep clean and dry; support Off-ground and cover completely with canvas tarpaulins - do not use polyethylene sheeting. When stored on roof structure, place only in approved areas, and distribute the weight to stay within live load limits of roof structure.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions will permit roofing to be installed in accordance with manufacturers' recommendations and warranty requirements.
- B. Apply roofing products in dry weather conditions.
- C. Do not expose roof products and components to inclement weather or when it is predicted 30 percent or more possibility for inclement weather.
- D. When ambient temperature is below 40 degrees F, expose only enough sensitive cements, sealants, and adhesives as required for use within a 4 hour period.
- E. Do not expose roofing membrane and accessories to constant temperature in excess of 180 degrees F.
- F. Protection: Provide special protection provisions for personnel traffic, and avoid traffic on completed areas of membrane installation.
- G. Emergency Provisions: Maintain on see, equipment necessary to apply emergency temporary edge seal in event of sudden rain storms or inclement weather.

1.8 WARRANTY

- A. Manufacturer's Extended Warranty: Furnish executed copy of roofing manufacturer's "total system" warranty agreement signed by authorized representative of PVC single-ply membrane roofing manufacturer against defective material and faulty workmanship. Warranty requirements include, but are not limited to, the following:
 - 1. Time period shall be 20 years from date of substantial completion, and monetary limit shall be full system 'No Dollar Limit.'
 - 2. Wind speed shall be 72 miles per hour.
 - 3. Include roofing products and materials, flashings, roof insulation, fasteners and accessories used in roofing assembly.
 - 4. Pro-rated warranties are not acceptable.
 - 5. Must be transferable and/or assignable for duration of time period.
 - 6. Terms, conditions, inclusions, exclusions, limitations, and obligations shall be clearly listed and defined in common language.
 - 7. Water ponding shall be clearly defined as to what is acceptable to the manufacturer and what is not acceptable.
 - 8. Signature by Owner shall not be required.
 - 9. If manufacturer or installer cannot be promptly contacted in event of damage to roofing beyond Owner's control, Owner shall have the right to make emergency repairs when necessary to protect the building without voiding the warranty.

10. Provisions for resolution of disagreements.
 11. Warranty obligation shall begin at date of substantial completion, regardless of status of payment for work by Owner.
 12. Warranty shall be governed by laws of location of project.
- B. Installer's Extended Warranty: Furnish executed copy of roofing installer's "edge-to-edge" warranty agreement signed by authorized representative of roofing installer against faulty workmanship. Warranty requirements include, but are not limited to, the following:
1. Time period shall be 2 years from date of substantial completion.
 2. Include roofing products and materials, flashings, expansion joints, roof insulation, fasteners and accessories used in roofing assembly.
 3. Must be transferable and/or assignable for duration of time period.
 4. Terms, conditions, inclusions, exclusions, limitations, and obligations shall be clearly listed and defined in common language.
 5. Signature by Owner shall not be required.
 6. If manufacturer or installer cannot be promptly contacted in event of damage to roofing beyond Owner's control, Owner shall have the right to make emergency repairs when necessary to protect the building without voiding the warranty.
 7. Provisions for resolution of disagreements.
 8. Warranty obligation shall begin at date of substantial completion, regardless of status of payment for work by Owner.
 9. Warranty shall be governed by laws of location of project.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers and Products: Subject to compliance with requirements, provide product by one of the manufacturers listed. If not listed, submit as substitution according to Conditions of the Contract and Division 1 Sections.
1. Polyvinyl Chloride Sheet Membrane (PVC).
 - a. Sika Sarnafil
 - b. Fibertite

2.2 ROOF INSULATION

- A. Gypsum Substrate Board and Cover Board:
1. Description: ASTM C 1177, glass-mat, water-resistant gypsum substrate, integral non-asphaltic surface coating:
 - a. Substrate Board (Alternate 2): 5/8 inch thick.
 - b. Cover Board: 1/2 inch thick.
 2. Acceptable Manufacturer and Product: G-P Gypsum Corp. -"Dens-Deck Prime."
- B. Polyisocyanurate Boards: ASTM C1289, Type II, Class 2 glass-fiber mat facer on both major surfaces; 20-pounds-per-square-inch minimum compressive strength.
1. Thickness: Two layers of 2.5 inches thick.
- C. Insulation Accessories:

1. General: Insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
2. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
3. Tapered Edge and Cant Strips: ASTM C728, perlite insulation board.

2.3 AIR BARRIER/ TEMPORARY ROOF

- A. A self-adhering, peel and stick membrane
 1. Sika Sarnafil Vapor Retarder SA 31.
 2. Primer: Vapor Retarder Primer WB.
- B. Or approved equal.

2.4 THERMOPLASTIC SINGLE-PLY MEMBRANE ROOFING

- A. Membrane Color: White
- B. Polyvinyl Chloride (PVC) Membrane: ASTM D 4434, Type III, uniform, flexible sheet formed from polyvinyl chloride with internal polyester reinforcement, not less than 60 mils thick.

2.5 ATTACHMENT COMPONENTS

- A. General: Furnish attachment components manufactured or provided by membrane manufacturer that will be included under warranty.
- B. ***Bonding Adhesive: Manufacturer's low VOC reactivating type product(s) to develop bond between following.***
 1. ***Cover board and membrane.***
- C. Metal Termination Bars: Manufacturer's standard extruded aluminum bars, approximately 1 inch wide, roll-formed and pre-punched for fasteners.
- D. Mechanical Fasteners for Insulation Attachment to Roof Decking:
 1. Plates: Aluminum-zinc-alloy-coated, or zinc coated sheet steel complying with FM 4470 for corrosion protection, approximately 3 inches.
 2. Screws: Factory-coated steel screws complying with corrosion resistance provisions of FM 4470, designed for fastening insulation to substrate indicated, tested by manufacturer for required pullout strength, and acceptable to roofing manufacturer. Fasteners for steel roof deck shall be #15 Heavy Duty.
- E. Insulation Board Adhesive:
 1. To attach substrate board to insulation: OMG Olybond500 adhesive in ribbon patterns as required by Sika Sarnafil and wind uplift loads specified on drawings.
 2. Approved equal.

2.6 FLASHINGS

- A. General: Furnish flashings manufactured or provided by membrane manufacturer that will be included under warranty.

- B. Membrane Flashings: Manufacturer's standard sheet membrane flashing of same material, type, thickness and color as roofing membrane.
- C. Membrane Faced Metal Flashings: Manufacturer's standard heat weldable membrane product fabricated of not less than 20 mils of same colored roofing membrane permanently bonded to commercial quality steel sheet, not less than 24 gauge, that has been hot-dipped galvanized according to ASTM A 527, G90.
- D. Prepainted, Metallic-Coated Steel Sheet for counterflashings: Steel sheet metallic coated by one of the following hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755, not less than 0.0179 inch thick unless otherwise indicated.
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 coating designation; structural quality.
 - 2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792, Class A250 coating designation, Grade 40; structural quality.
 - 3. Exposed Finishes: Apply high-performance organic coil coating finish to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Fluoropolymer System: Manufacture's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2605.
 - b. Color: White

2.7 EQUIPMENT

- A. Hot Air Welding Equipment: Self-propelled machine suitable for type of hot air welding required and calibrated prior to beginning work of this project

2.8 FABRICATION OF METAL FLASHINGS

- A. Design Standards: Fabricate metal flashings to comply with manufacturers quality standards that apply to the design, thickness, dimensions, metal, and other characteristics of the item indicated. Verify shapes and dimensions of surfaces to be covered before fabricating.
- B. Fabrication Provisions:
 - 1. Form metal flashings in shop on a bending brake. Do shaping, trimming and hand seaming on the bench as far as practical with proper sheet metal working tools. Fabricate supplementary parts necessary to complete each item though work is not definitely indicated.
 - 2. Fabricate metal flashings that fit substrates and result in waterproof and weather resistant performance once installed.
 - 3. Form exposed metal flashing work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.
 - 4. Make angle bends and folds for interlocking the metal with full regard for expansion and contraction to avoid buckling or fullness in the metal after it is installed. Form materials to shape indicated with straight lines, sharp angles and smooth curves.

5. Fabricate interior and exterior comers, intersections, and complex flashing conditions in the shop, rather than in the field, with properly folded, constructed and soldered joints. Joints between these fabricated pieces and other typical flashings to be installed shall not be less than 24 inches from any soldered joint.
6. Exposed edges of flashings shall be folded and hemmed.
7. Provide conceal fasteners and expansion provisions. Exposed fasteners are not allowed on faces of metal flashings exposed to public view.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrate surfaces to receive thermoplastic single-ply membrane roofing system and associated work and conditions under which roofing will be installed. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to Installer. Starting work within a particular area will be construed as applicator's acceptance of surface conditions.
 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.
 2. Verify that wood nailers and blocking are securely anchored with non-corrosive anchors to roof deck at penetrations and terminations matching thicknesses of insulation required and in accordance with quality standards.

3.2 PREPARATION

- A. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's instructions. Remove sharp projections.
- B. Fill gaps and voids between substrate materials that are wider than 1/4 inch with similar materials as substrate.
- C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install thermoplastic single-ply membrane roofing and components according to roofing manufacturer's instructions, approved submittals and Contract Documents.
- B. Coordinate installing roofing system components so insulation and work-in-progress areas are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.
- C. Provide cutoffs at end of each day's work to cover exposed sheets and insulation with a course of roofing membrane with joints and edges sealed.
- D. Complete terminations and base flashings and provide temporary seals to prevent Water from entering completed sections of roofing system.
- E. Remove and discard temporary seals before beginning work on adjoining roofing.

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- F. Use mechanical fastener tools with depth locator to ensure proper installations.

3.4 INSTALLING NAILERS AND BLOCKING

- A. Install wood nailers and blocking at perimeter of the roof, at edges of insulation, and other required locations according to the quality standards and manufacturers requirements.
- B. Nailers and blocking shall be anchored together, and to their respective substrates, using non-corrosive fasteners according to the location spacing and embedment requirements of quality standards; include fasteners within 6 inches of each end.
- C. Provide 1/2 inch wide vent space between opposing ends of wood materials.
- D. Height of nailers and blocking shall match height of adjacent insulation.

3.5 SUBSTRATE BOARD AND VAPOR RETARDER INSTALLATION

- A. Mechanically fasten 5/8" DensDeck Prime gypsum substrate board in accord with approved shop drawing submittal.
- B. Fasteners are to be installed consistently in accordance with fastener manufacturer's recommendations. Fasteners are to have minimum penetration into structural deck recommended by the fastener and roof membrane manufacturers.
- C. Use fastener tools with a depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation.
- D. Air Barrier/ Temporary Roof Installation: Prime substrate board and adhere self-adhering membrane full coverage over DensDeck Prime substrate board in accordance with manufacturer's instructions. Turn up self-adhering membrane at all intersections and terminations to provide a flashing detail separate from and independent of the roofing membrane above the rigid board insulation.

3.6 INSTALLING INSULATION

- A. Install insulation and cover board according manufacturer's instructions and recommendations for installing and adhering insulation to substrate.
- B. Secure insulation to top of roof deck according to requirements of FMG's "Approval Guide" for specified Windstorm Resistance Classification.
 - 1. Secure with urethane insulation adhesive beads at a minimum rate of 6 inches on center.
 - a. Increase adhesive ribbons to 4" on center at 8 foot perimeters and 8 foot by 8 foot corners.
- C. Only install as much insulation as can be covered in a day's roofing operation, and do not leave exposed to precipitation.
- D. Warped or bent insulation boards, or boards with damaged facers, shall not be used.
- E. Neatly cut and trim insulation to fit around penetrations and projections.

3.7 INSTALLING ROOF MEMBRANE

- A. Clean cover board surface of debris, and ensure material is dry, smooth with no excessive surface imperfections that would telegraph through roofing membrane, and that there are no contaminated or unsound surfaces. Broken, delaminated, damaged, or wet insulation boards shall be replaced with dry, sound material.
- B. Unroll membrane to complete length and position without stretching, allow to relax for amount of time recommended by manufacturer, inspect for damage, creases, or deficiencies, then reroll as recommended for installation.
- C. Spread adhesive over properly prepared substrates at rate recommended by manufacturer.
- D. Carefully unroll membrane sheets into adhesive overlapping edges as required by manufacturer for amount of material required for lapping. Keep sheets even and continue unrolling until sheet is laid flat. Wrinkles in material are not acceptable and should be removed and replaced. Remove and clean adhesive left exposed after sheet installation. Use large, weighted roller to embed sheet into adhesive.
- E. Membrane Seam Installation:
 - 1. Clean seam areas and hot-air weld and roll side and end laps of sheets and flashings according to manufacturer's instructions to ensure watertight seam installation.
 - 2. Repair tears, voids, and lapped seams in roofing membrane that do not comply with requirements.

3.8 INSTALLING FLASHINGS

- A. Install metal and membrane flashings and adhere to substrate according to manufacturer's instructions, and FMG for specified Windstorm Resistance Classification. Complete flashing concurrently with roofing work so that a watertight condition exists daily.
- B. General Installation Requirements:
 - 1. Anchor units of work securely in place providing for thermal expansion of units; conceal fasteners where possible, and set units true to line and level.
 - 2. Install work to fit substrates with laps, joints, and seams that will be permanently watertight and weatherproof.
 - 3. Install exposed work that is without excessive oil canning, buckling, and tool marks with exposed edges folded back to form hems.
 - 4. Provide for thermal expansion of exposed sheet metal work. Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corners or intersections.
- C. Apply bonding adhesive to substrate and underside of flashing sheet at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- D. Clean seam areas, overlap sheets, and firmly roll flashings into adhesive. Hot air weld side and end laps to ensure watertight seam installation.

3.9 ADJUSTMENTS

- A. Correct, or remove and replace, deficiencies in roofing membrane that does not comply with requirements, so that they are in a condition free of damage and deterioration at the time of Substantial Completion and completed installation will be according to warranty requirements.
- B. Manufacturers Field Service:
 - 1. Manufacturers shall provide qualified technical representative on-site once during the roofing work.
 - 2. Representative shall inspect material and installation to insure installation is proceeding in accordance with manufacturer's designs, recommendations and warranty requirements.
 - 3. Representative shall submit report as indicated in the "Quality Assurance" Article above.
 - 4. Manufacturer shall perform a final inspection after the work has been completed, verifying that the work has been performed in an acceptable, and warrantable manner by the manufacturer.
- C. Patching of sample cuts and retesting of materials failing to meet specified requirements shall be at Contractor's expense.

3.10 PROTECTION

- A. Protect roofing membrane from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage and repair or replace accordingly.

END OF SECTION

SECTION 07 54 19

ALTERNATE 1 - SIMULATED STANDING SEAM PVC ROOFING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Adhered polyvinyl-chloride (PVC) roofing system.
 - 2. PVC coated sheet metal for flashings and gutter compatible with PVC roofing.

1.02 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:
 - 1. Base flashings and membrane terminations.
 - 2. Flashing at intersections of PVC coated sheet metal and suspended gutters.
 - 3. Layout of simulated standing seam extrusions.
- C. Samples for Verification: For the following products:
 - 1. Sheet roofing, of colors required.
 - 2. Standing seam extrusion, of colors required.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
- C. Product Test Reports: For components of roofing system, tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- E. Field quality-control reports.
- F. Sample Warranties: For manufacturer's special warranties.

1.05 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for roofing system similar to that used for this Project.

- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.07 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, approval or listing agency markings, 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.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- 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. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.08 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.09 WARRANTY

- A. Manufacturer's Warranty
 - 1. Written "No Dollar Limit" warranty signed by roofing-system manufacturer, including
 - a. Repair or replace components of roofing system that do not comply with requirements; that do not remain watertight; that fail in adhesion, cohesion, or general durability; or that deteriorate in manner not clearly specified by submitted roofing-system manufacturer's data as an inherent quality of material for application indicated. Warranty includes defects such as blisters, ridging, and excessive surfacing loss.
 - b. Removal and replacement of membrane roofing sheets, polymeric coated sheet metal, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of roofing system.
 - c. Labor and materials to perform warranty work.
 - 2. Warranty Period: 20 years from date of completion of roofing system.
- B. Roofing Installer's Warranty
 - 1. Written warranty, signed by Roofing Installer, including
 - a. Repair or replace components of roofing system that do not comply with requirements; that do not remain watertight; that fail in adhesion, cohesion, or general durability; or that deteriorate in manner not clearly specified by submitted roofing-system manufacturer's data as inherent quality of material for application indicated.

- b. Removal and replacement of membrane roofing sheets, polymeric coated sheet metal, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of roofing system.
- c. Labor and materials to perform warranty work.
- 2. Warranty Period: 2 years from date of completion of roofing system.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Sika Sarnafil Décor Roof System at all other locations or approved equal; provide SarnaClad PVC coated sheet metal, or approved equal.
- B. Source Limitations: Obtain components including roof insulation fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.02 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
 - 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
 - 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design Loads: Roofing system shall withstand the loads, or combination of loads, acting normal to the surfaces described below. Load combinations and durations shall be as per the specified requirements of ASCE 7-10.
 - 1. Wind loading in accordance with ASCE 7-10.
 - a. Basic wind speed: 90 mph.
 - b. Exposure Category C.
 - c. Risk Category III.
- D. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.03 PVC ROOFING

- A. PVC Sheet: ASTM D 6754/D 6754M / *ASTM D4434/ D4434M*, fabric reinforced and fabric backed.
 - 1. Thickness: 60 mils, nominal.
 - 2. Exposed Face Color: Dark Bronze.

- a. Submit color samples.

2.04 PVC COATED SHEET METAL

- A. Pre-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 coating designation; structural quality, 0.0276 inches thick.
 - 1. Coating Thickness: 20 mils minimum.
 - 2. Exposed Face Color: Match membrane color.

2.05 SIMULATED METAL ROOF STANDING SEAM

- A. A PVC extrusion used to emulate the appearance of a standing seam metal rib roof system. Each rib is 1 inch high with a base width of 1-3/8 inch and a profile width of 1/2 inch.

2.06 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
 - 2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with Bay Area Air Quality Management District's requirements for VOC content.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet.
- C. Sheet Metal Flashing: Manufacturer's PVC coated sheet metal.
- D. Bonding Adhesive: Manufacturer's Low VOC.
- E. Slip Sheet: Manufacturer's standard, of thickness required for application.
- F. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- G. Fasteners: Stainless steel fasteners designed for fastening sheet metal gutter to adjacent substrates, and acceptable to roofing system manufacturer.
- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.07 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by PVC roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 3, felt or glass-fiber mat facer on both major surfaces.
- C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.08 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.

- B. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Building Products; Dens Deck Prime or a comparable product by one of the following:
 - a. National Gypsum Company.
 - b. United State Gypsum Company.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 05 31 00 - Steel Decking.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.03 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Install roofing and auxiliary materials to tie in to adjacent roofing types to maintain weathertightness of transition between different roof materials and to not void warranty for either systems.

3.04 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

- D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
 - 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- E. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Mechanically fasten coverboard through underlying insulation to the structural deck at the rate of 1 fastener per 2 square feet.

3.05 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before installing.
- B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- C. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.
- E. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing.
- F. Apply roofing with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
 - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
 - 4. Welding equipment shall be provided by or approved by the roofing manufacturer.
- H. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.06 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings.

3.07 SIMULATED METAL ROOF STANDING SEAM INSTALLATION

- A. Install PVC standing seam extrusion parallel with roof slope and as indicated in the Drawings.
- B. Ensure top surface of field roofing membrane is clean prior to head welding the seam extrusions. Check all membrane seams and re-weld any deficiencies prior to seam extrusion installation.
- C. Provide and lay out seam extrusion spacing as indicated in the Drawings.

- D. Pre-assemble PVC seam extrusions of the required length. Join lengths using the manufacturer's connector accessories.
- E. Heat weld the seam extrusions per the manufacturer's written instructions.

3.08 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Architect.
- B. Flood Testing: Flood test each roof drain area for leaks and five full lengths of sheet metal gutter along the edge of one triangular section of membrane roofing, according to recommendations in ASTM D 5957, after completing roofing and flashing but before overlying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.
 - 1. Flood to an average depth of 2-1/2 inches with a minimum depth of 1 inch and not exceeding a depth of 4 inches. Maintain 2 inches of clearance from top of base flashing.
 - 2. Flood each area for 48 hours.
 - 3. After flood testing, repair leaks, repeat flood tests, and make further repairs until roofing and flashing installations are watertight.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- D. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.09 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 54 19

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Supply, fabrication, and installation of roof and wall flashings and counterflashings; copings; gutters and downspouts.
- B. Related Sections:
 - 1. Section 07 54 00 - Adhered PVC Roofing.
 - 2. Section 07 54 19 - Simulated Standing Seam PVC Roofing

1.2 REFERENCES

- A. Reference Standards: Latest edition as of Specification date.
 - 1. American Architectural Manufacturers Association (AAMA):
 - a. 611: Voluntary Specification for Anodized Architectural Aluminum.
 - b. 2604: Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - 2. ASTM International:
 - a. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - b. A755/A755M: Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 - c. A792/A792M: Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - d. B209: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - e. C920: Standard Specification for Elastomeric Joint Sealants.
 - f. C1311: Standard Specification for Solvent Release Sealants.
 - g. D226/D226M: Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
 - 3. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
 - a. Architectural Sheet Metal Manual.
 - 4. SSPC: The Society for Protective Coatings:
 - a. Paint 12: Cold Applied Asphalt Mastic Paint (Extra Thick Film) (discontinued 2005).

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate Work to ensure that adjacent areas are not adversely affected. Coordinate:
 - 1. With Owner's Representative.
 - 2. With other trades:
 - a. To ensure that work done by other trades is complete and ready for sheet-metal Work.
 - b. To avoid or minimize work on, or in immediate vicinity of, sheet-metal Work in progress.
 - c. To ensure that subsequent work will not adversely affect completed sheet-metal Work.

3. With interfacing and adjoining construction to provide leakproof, secure, and non-corrosive installation. Coordinate:
 - a. Installation of roof drainage system with installation of roof perimeter flashing.
 - b. Installation of roof-penetration flashing with installation of roofing and other items penetrating roof.
 - c. Construction schedule.
 - d. Availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - e. Site use, access, staging, and set-up location limitations.
 - f. Approved mockup procedures.
 - g. Forecast weather conditions.
 - h. Surface preparation and substrate condition and pretreatment.
 - i. Installation procedures.
 - j. Special details.
 - k. Testing and inspection requirements.
 - l. Site protection measures.
 - m. Governing regulations.
4. Contractor's Site superintendent, waterproofing manufacturer's technical representative, waterproofing Installer, sheet-metal fabricator, sheet-metal Installer, Owner's Representative, and Architect/Engineer shall attend.

1.4 SUBMITTALS

- A. Product Data: For each product specified.
 1. Include Safety Data Sheets (SDS) for information only; safety restrictions are sole responsibility of Contractor.
- B. Shop Drawings: Show layouts, profiles, shapes, seams, dimensions, and details for fastening, joining, supporting, interface conditions with other materials, and anchoring sheet-metal flashing and trim.
- C. Samples: For each type of sheet-metal flashing and trim. Construct typical lap splice or seam for mechanically-jointed systems, and solder lap or seam for field-solderable systems.
- D. Installer Qualifications: Evidence that Installer's *existing company* has minimum five years of continuous experience in similar sheet-metal Work; list of at least five representative, successfully-completed projects of similar scope and size, including:
 1. Project name.
 2. Owner's name.
 3. Owner's Representative name, address, and telephone number.
 4. Description of work.
 5. Sheet-metal members installed.
 6. Project supervisor.
 7. Total cost of sheet-metal work and total cost of project.
 8. Completion date.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced firm that has successfully completed sheet-metal work similar in material, design, and extent to that indicated for Project. Must have successful installations of specified materials in local area in use for minimum of five years.
 - 1. Employ foreman with minimum five years of experience as foreman on similar projects, who is fluent in English, to be on Site at all times during Work. Do not change foremen during the course of the Project except for reasons beyond the control of the Installer; inform Architect/Engineer in advance of any changes.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Sheet-Metal Members: Deliver, store, and handle materials in such a manner as to prevent damage to materials or structure.
- B. Sealants, Coatings, and Miscellaneous Materials:
 - 1. Deliver materials to Site in original containers and packaging with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, lot number, and directions for storing.
 - 2. Keep materials dry and do not allow materials to be exposed to moisture during transportation, storage, handling, and installation. Reject and remove from Site new materials which exhibit evidence of moisture during application, or have been exposed to moisture.
 - 3. Store materials in original, undamaged containers in clean, dry, protected location on raised platforms with weather-protective coverings, within temperature range required by manufacturer. Protect stored materials from direct sunlight. Manufacturer's standard packaging and covering is not considered adequate weather protection.
 - 4. Handle materials to avoid damage.
 - 5. Conspicuously mark damaged or opened containers or containers with contaminated materials, and remove from Site as soon as possible.
 - 6. Remove and replace materials that cannot be applied within stated shelf life.
- C. Limit stored materials on structures to safe loading capacity of structure at time materials are stored, and to avoid permanent deck deflection.

1.7 PROJECT CONDITIONS

- A. Verify existing dimensions and details prior to start of sheet-metal Work. Notify Architect/Engineer of conditions found to be different than those indicated in the Contract Documents. Architect/Engineer will review situation and inform Contractor and Installer of changes.
- B. Comply with Owner's limitations and restrictions for Site use and accessibility.
- C. Environmental Limitations: Install sheet-metal members when existing and forecast weather conditions permit sealants, coatings, and miscellaneous materials to be installed according to sealant, coating, or miscellaneous material manufacturer's written instructions and warranty requirements.
- D. Handle and install materials in strict accordance with safety requirements required by sheet-metal manufacturer; Safety Data Sheets (SDS); and local, state, and federal rules and

regulations. Maintain Safety Data Sheets (SDS) with materials in storage area and available for ready reference on Site.

1.8 CHANGES IN WORK

- A. During rehabilitation work, existing conditions may be encountered which are not known or are at variance with the Contract Documents. Such conditions may interfere with the Work and may consist of damage or deterioration of the substrate or surrounding materials that could jeopardize the integrity or performance of the Work.
 - 1. Notify Architect/Engineer of conditions that may interfere with the proper execution of the Work or jeopardize the performance of the Work prior to proceeding with the Work.

1.9 WARRANTY

- A. Contractor's Warranty:
 - 1. Written warranty, signed by Contractor, including:
 - a. Replace sheet-metal Work that does not comply with requirements; that has corroded surface, coating that fails cohesively or adhesively, or other surface defects or imperfections; or that deteriorates in a manner not clearly specified by material supplier's data as an inherent quality of the material for the application indicated.
 - b. Remove and replace sealant that has failed cohesively or adhesively; or that deteriorates in a manner not clearly specified by sealant manufacturer's data as an inherent quality of the material for the application indicated.
 - c. Repair or replacement, to satisfaction of Owner, of other work or items which may have been displaced or damaged as consequence of defective Work.
 - d. Warranty does not include deterioration or damage from changes in sheet-metal environment from that reasonably anticipated at Substantial Completion, or physical damage from adjacent activities.
 - 2. Warranty Period: Two years after Substantial Completion date.
- B. Manufacturer's Warranty:
 - 1. Written warranty, signed by sheet-metal manufacturer, including:
 - a. Replace sheet-metal Work that does not comply with requirements; that has corroded surface, coating that fails cohesively or adhesively, or other surface defects or imperfections; or that deteriorates in a manner not clearly specified by material supplier's data as an inherent quality of the material for the application indicated.
 - b. Warranty does not include deterioration or damage from changes in sheet-metal environment from that reasonably anticipated at Substantial Completion, or physical damage from adjacent activities.
 - 2. Written warranty, signed by manufacturer against defects to the metal panels including color, fade, chalking, and film integrity.
 - 3. Warranty Period: 30 years after Substantial Completion date.

PART 2 PRODUCTS

2.1 SHEET METAL

- A. For copings; drip edge; gravel stops; hanging gutters; downspouts; *and interior trim sections*;

1. Aluminum Sheet: ASTM B209, Alloy 3003, 3004, 3105, or 5005; temper suitable for forming and structural performance required, but not less than H14; 0.040 inches thick unless otherwise designated.; finished as follows:
 - a. Exposed, Coil-coated Finishes:
 - 1) High-performance-organic finish: Three-coat thermocured system containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2604, except humidity and salt spray resistances of 2,000 hours; color as selected by Owner from manufacturer's full range.

2.2 AUXILIARY MATERIALS

- A. Underlayment Materials:
 1. Felts: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt, non-perforated.
 - a. Slip Sheet: Rosin-sized paper, minimum 3 pounds per 100 square feet.
 2. Self-Adhering Sheets: Rubberized-asphalt, self-adhering waterproofing sheets.
- B. Miscellaneous Materials:
 1. Fasteners: Wood screws, annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads. Size fasteners to provide penetration into substrate of at least 1 1/4 inches for nails and 3/4 inches for wood screws.
 - a. Use stainless-steel fasteners, except that aluminum fasteners may be used with aluminum sheet metal, and copper or hardware bronze fasteners may be used with copper sheet metal.
 - b. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 1) Blind Fasteners: High-strength aluminum or stainless-steel rivets.
 2. Sealing Tape: Pressure-sensitive, 100-percent solids, polyisobutylene-compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, non-staining tape.
 3. Elastomeric Sealant: ASTM C920, elastomeric polyurethane sealant; of type, grade, class, and use classifications required to seal joints in sheet-metal flashing and trim and remain watertight.
 4. Butyl Sealant: ASTM C1311, single-component, solvent-release, butyl-rubber sealant; polyisobutylene-plasticized; heavy-bodied for hooked-type expansion joints with limited movement.

2.3 FABRICATION

- A. Custom fabricate to comply with recommendations in SMACNA's Architectural Sheet Metal Manual, that apply to design, dimensions, metal, and other characteristics of item indicated. Conform to dimensions and profiles shown in SMACNA's Architectural Sheet Metal Manual, unless requirements that are more stringent are indicated.
 1. Obtain field measurements for accurate fit before fabrication.
 2. Shop fabricate items where practicable.

- B. Fabricate without excessive oil canning, buckling, or tool marks that are visually objectionable in opinion of Architect/Engineer, and true to line and levels indicated, with exposed edges folded back to form hems.
- C. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant and in compliance with recommendations in SMACNA's Architectural Sheet Metal Manual.
- D. Expansion Provisions: Use lapped or bayonet-type expansion provisions where possible; otherwise, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.
- E. Conceal fasteners and expansion provisions, where possible, on exposed-to-view sheet-metal flashing and trim, unless otherwise indicated.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, non-corrosive metal, and in thickness not less than that of metal being secured.
- G. Roof Drainage Fabrications:
 - 1. Hanging Gutters: Fabricate in minimum 8-foot-long sections, to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required.
 - a. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended in SMACNA's Architectural Sheet Metal Manual, but not less than twice the gutter thickness.
 - b. Fabricate expansion joints, expansion-joint covers and gutter accessories from same metal as gutters.
 - 2. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers from same material as downspouts, and anchors.
- H. Perimeter Fabrications:
 - 1. Roof Edge Flashing Gravel Stop and Fascia Caps: Fabricate in minimum 8-foot-long, but not exceeding 10-foot-long, sections. Furnish with 6-inch-wide joint cover plates.
 - 2. Copings: Fabricate in minimum 8-foot-long, but not exceeding 10-foot-long, sections.
 - a. Fabricate joint plates of same thickness as copings.
 - b. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg.
 - c. Miter corners and seal watertight.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions with Installer for compliance with requirements and other conditions affecting performance of sheet-metal flashings and trim.
 - 1. Ensure that work done by other trades is complete and ready for sheet-metal Work.
 - 2. Verify that areas and conditions under which sheet-metal Work is to be performed permit proper and timely completion of Work.
 - 3. Notify Architect/Engineer in writing of conditions which may adversely affect installation or performance of sheet-metal Work and recommend corrections.

4. Do not proceed with installation of sheet-metal flashings and trim until adverse conditions have been corrected and reviewed by Architect/Engineer.
5. Commencing sheet-metal Work constitutes acceptance of Work surfaces and conditions.

3.2 PROTECTION

- A. Take precautions to ensure safety of people, including building users, passers-by, and workmen, and animals, and protection of property, including adjacent building elements, landscaping, and motor vehicles.
- B. Prevent construction debris and other materials from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
- C. Protect paving and sidewalks, and adjacent building areas from mechanical damage due to scaffolding and other equipment.
- D. Limit access to Work areas.
- E. Erect temporary protective canopies, as necessary, over walkways and at points of pedestrian and vehicular access that must remain in service during Work.
- F. Assume responsibility for injury to persons or damage to property due to Work, and remedy at no cost to Owner.

3.3 INSTALLATION

- A. General: Install sheet-metal flashings and trim according to recommendations in SMACNA's Architectural Sheet Metal Manual and as indicated.
- B. Install sheet-metal flashing and trim to fit substrates and to result in watertight performance.
 1. Install true to line and levels indicated.
 2. Where exposed, install without excessive oil canning, buckling, or tool marks.
 3. Provide uniform, neat seams with minimum exposure of solder, welds, or sealant.
 4. Do not torch cut sheet metal.
- C. Provide for thermal expansion of exposed flashing and trim.
 1. Space movement joints no more than 10 feet apart, with no joint within 24 inches of corner or intersection.
 2. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.
- D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
- E. Anchor sheet-metal flashing and trim and other components of Work securely in place, with provisions for thermal and structural movement. Use fasteners protective coatings, separators, sealants, and other miscellaneous items as required.
 1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners

- F. Seal joints with elastomeric sealant as required for watertight construction.
- G. Roof Drainage System Installation:
 - 1. Hanging Gutters:
 - a. Join sections with with lapped joints sealed with elastomeric sealant.
 - b. Slope to downspouts.
 - c. Attach gutters at eave or fascia to firmly anchored straps spaced not more than 36 inches apart.
 - d. Provide end closures and seal watertight with sealant.
 - e. Install expansion joints with caps at locations indicated but not exceeding 50 feet apart.
 - 2. Downspouts:
 - a. Join sections with 1-1/2-inch-telescoping joints.
 - b. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches on center in between.
- H. Roof Flashing Installation:
 - 1. General:
 - a. Set units true to line and level as indicated.
 - b. Provide concealed fasteners where possible.
 - c. Install Work with laps, joints, and seams that will be permanently watertight.
 - 2. Roof Edge Flashing:
 - a. Anchor as shown on Drawings.
 - b. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 12-inch centers.
 - 3. Copings:
 - a. Anchor as shown on Drawings.
 - b. Interlock exterior bottom edge of coping with continuous cleats anchored to substrate at 12-inch centers.
 - c. Anchor interior leg of coping with screw fasteners and washers at 18-inch centers.
 - 4. Counterflashing: Insert counterflashing behind equipment and fit tightly to base flashing.
 - a. Extend counterflashing 4 inches over base flashing.
 - b. Secure in waterproof manner.
 - c. Lap counterflashing joints at least 4 inches and bed with elastomeric sealant.

3.4 CLEANING

- A. At the end of each workday, clean Site and Work areas and place rubbish, empty cans, rags, and other discarded materials in appropriate containers.
- B. After completing sheet-metal Work:
 - 1. Clean spillage and soiling from adjacent surfaces using cleaning agents and procedures recommended by manufacturer of affected surface. Exercise care to avoid scratching or damage to surfaces.
 - 2. Repair surfaces stained, marred, or otherwise damaged during roofing Work.
 - 3. Clean up debris and surplus materials and remove from Site.

3.5 PROTECTION

- A. Protect sheet-metal flashings and trim from damage and wear during remainder of construction period.

END OF SECTION

SECTION 08 45 23

TRANSLUCENT WALL AND ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the insulated translucent sandwich panel skylight and wall panel system and accessories as shown and specified. Work includes providing and installing:
 - 1. Flat factory prefabricated structural insulated translucent sandwich panels
 - 2. Aluminum installation system
 - 3. Aluminum flashing attached to skylights
- B. Related Sections:
 - 1. Rough Carpentry: Section 06 10 00
 - 2. Roofing: Section: 07 41 13
 - 3. Flashing and Sheet Metal: Section 07 62 00

1.2 SUBMITTALS

- A. Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of skylight components.
- B. Submit shop drawings. Include elevations and details.
- C. Submit manufacturer's color charts showing the full range of colors available for factory-finished aluminum.
 - 1. Submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.
 - a. Sandwich panels: 14" x 28" units
 - b. Factory finished aluminum flashing: 5" long sections
 - c. Intermediate and perimeter framing: 5" long sections
- D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.
- E. ***Submit engineering calculations stamped by a licensed structural engineer in Illinois showing the wall and skylight systems meet all design loadings with code safety factors and allowable deflections. In no case will ponding water on the skylight panels be permitted.***

- F. Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed reports will be acceptable if for current manufacturer and indicative of products used on this project.

1. Reports required are:

- a. International Building Code Evaluation Report
- b. Flame Spread and Smoke Developed (UL 723) – Submit UL Card
- c. Burn Extent (ASTM D 635)
- d. Color Difference (ASTM D 2244)
- e. Impact Strength (UL 972)
- f. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037)
- g. Bond Shear Strength (ASTM D 1002)
- h. Beam Bending Strength (ASTM E 72)
- i. Fall Through Resistance (ASTM E 661)
- j. Insulation U-Factor (NFRC 100)
- k. NFRC System U-Factor Certification (NFRC 700)
- l. Solar Heat Gain Coefficient (NFRC or Calculations)
- m. Condensation Resistance Factor (AAMA 1503)
- n. Air Leakage (ASTM E 283)
- o. Structural Performance (ASTM E 330)
- p. Water Penetration (ASTM E 331)
- q. Class A Roof Covering Burning Brand (ASTM E 108)

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications

1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope and location. At least three of the projects shall have been in successful use for ten years or longer.
2. Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an accredited agency.
3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with AC177 “Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems” as issued by the ICC-ES.

- B. Installer’s Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified skylight systems for at least five consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

1.4 PERFORMANCE REQUIREMENTS

- A. The manufacturer shall be responsible for the configuration and fabrication of the complete skylight and wall panel systems.
 - 1. ***Include structural analysis data signed and sealed by the qualified structural engineer (licensed in Illinois) responsible for their preparation.***
 - 2. Standard skylight system shall have less than 0.01 cfm/ft² air leakage by ASTM E 283 at 6.24 PSF (50 mph) and no water penetration by ASTM E 331 at 15 PSF; and structural testing by ASTM E 330.

1.5 DELIVERY STORAGE AND HANDLING

- A. Deliver panel system, components and materials in manufacturer's standard protective packaging.
- B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.6 WARRANTY

- A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work, which fails in materials or workmanship within five years of the date of delivery. Failure of materials or workmanship shall include water leakage, condensation, yellowing, excessive deflection, deterioration of finish on metal in excess of normal weathering, defects in accessories, and fiber bloom on insulated translucent sandwich panels and entire system.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The basis for this specification is for products manufactured by Kalwall Corporation. Other manufacturers may bid this project provided they comply with all of the performance requirements of this specification and submit evidence thereof. Listing other manufacturers' names in this specification does not constitute approval of their products or relieve them of compliance with all the performance requirements contained herein.
- B. Kalwall Corporation, Tel: (800) 258-9777 – Fax: (603) 627-7905 – Email: info@kalwall.com

2.2 PANEL COMPONENTS

- A. Face Sheets
 - 1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
 - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
 - b. Face sheets shall not deform, deflect or drip when subjected to fire or flame.

2. Interior face sheets:

- a. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 50 and smoke developed no greater than 250 when tested in accordance with UL 723.
- b. Burn extent by ASTM D 635 shall be no greater than 1”.

3. Exterior face sheets:

- a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3 CIE Units DELTA E by ASTM D 2244 after 5 years outdoor South Florida weathering at 5° facing south, determined by the average of at least three white samples with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.
- b. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact minimum of 70 ft. lbs. without fracture or tear when impacted by a 3-1/4” diameter, 5 lb. free-falling ball per UL 972.

4. Appearance:

- a. Exterior face sheets (Roof & Walls): Smooth, 0.070” thick and Crystal in color.
- b. Interior face sheets (Roof): Smooth, 0.045” thick and White in color.
- c. Interior face sheet (Walls): Smooth, 0.045” thick and White/Opaque White (*bottom 5'-0" of walls to be opaque white*)
- d. Face sheets shall not vary more than $\pm 10\%$ in thickness and be uniform in color.
- e. ***All colors are to be approved by Owner based on submitted samples prior to ordering panels.***

B. Grid Core

1. Thermally broken I-beam grid core shall be of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16”.
2. I-beam Thermal break: Minimum 1”, thermoset fiberglass composite.

C. Laminate Adhesive

1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council “Acceptance Criteria for Sandwich Panel Adhesives”.
2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.
3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to four separate conditions:
 - a. 50% Relative Humidity at 68° F: 540 PSI
 - b. 182° F: 100 PSI

- c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
- d. Accelerated Aging by ASTM D 1037 at 182° F: 250 PSI

2.3 PANEL CONSTRUCTION

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
 - 1. Thickness: 2-3/4"
 - 2. Light transmission: 20%
 - 3. Solar heat gain coefficient: 26%.
 - 4. Panel U-factor by NFRC certified laboratory: 0.23 Complete insulated panel system shall have NFRC certified U-factor of 0.29.
 - 5. Grid pattern: Nominal size: 8" x 20"
- B. Standard panels shall deflect no more than 1.9" at 30 PSF in 10' 0" span without a supporting frame by ASTM E 72.
- C. Standard panels shall withstand 1200° F fire for minimum one hour without collapse or exterior flaming.
- D. Thermally broken panels: Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.
- E. Skylight System:
 - 1. Skylight system shall pass Class A Roof Burning Brand Test By ASTM E 108.
- F. Skylight System shall meet the fall through requirements of OSHA 1910.23 as demonstrated by testing in accordance with ASTM E661, thereby not requiring supplemental screens or railings.

2.4 BATTENS AND PERIMETER CLOSURE SYSTEM

- A. Closure system:
 - 1. Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
 - 2. Skylight perimeter closures at curbs shall be factory sealed to panels.
- B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.
- C. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.
- D. Finish:

1. Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604. Color to be Kalwall Maroon #96. Color is to match existing storefronts as closely as possible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer shall examine substrates, supporting structure and installation conditions.
- B. Do not proceed with panel installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection:
 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 2. Where aluminum will contact concrete, masonry or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

3.3 INSTALLATION

- A. Install the skylight system in accordance with the manufacturer's suggested installation recommendations and approved shop drawings.
 1. Anchor component parts securely in place by permanent mechanical attachment system.
 2. Accommodate thermal and mechanical movements.
 3. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.
 4. Provide drainage to the exterior for all wall and skylight systems for any incidental water leakage and/or condensation, including moisture on the interior face of the system. Two lines of defense against water leakage are to be provided at all areas.
- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.
- C. *Wet seal all vertical and head joints in panel system with new silicone fillet seals.*

3.4 FIELD QUALITY CONTROL

- A. Prior to installing caps an exterior face of the system, Architect/Engineer will run water in drainage channels to test water tightness of drainage systems. Tests will be performed under low pressure (less than 2 psi) without overflowing section. A minimum of 25% of the drainage channels are to be tested by Architect/Engineer. If failure occurs, 100% of areas are to be tested.

- B. Water Test following installation of face caps and sealants: Installer to test skylights according to procedures in AAMA 501.2. Assume 3 areas for testing approximately 50LF of joints each. Test locations to be selected by Architect/Engineer. For every failure, an additional section with 100 LF of joints is to be tested (including retesting of the repaired failure area). If three failures occur, testing is to be performed on 100% of the wall and skylight systems.
- C. Repair or replace work that does not pass testing or that is damaged by testing and retest work at no cost to Owner.

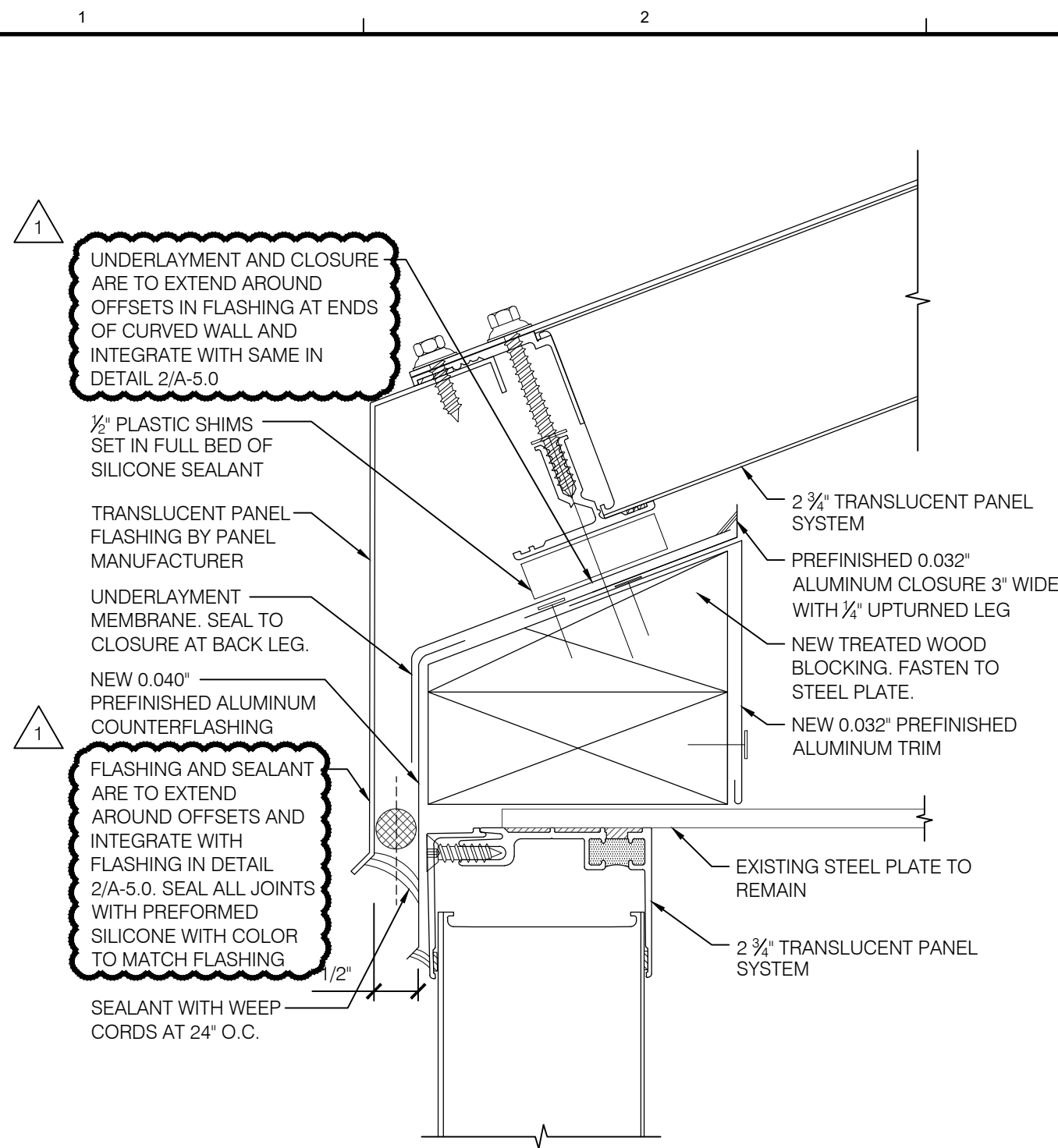
3.5 CLEANING

- A. Clean the skylight system interior and exterior, immediately after installation.
- B. Refer to manufacturer's written recommendations.

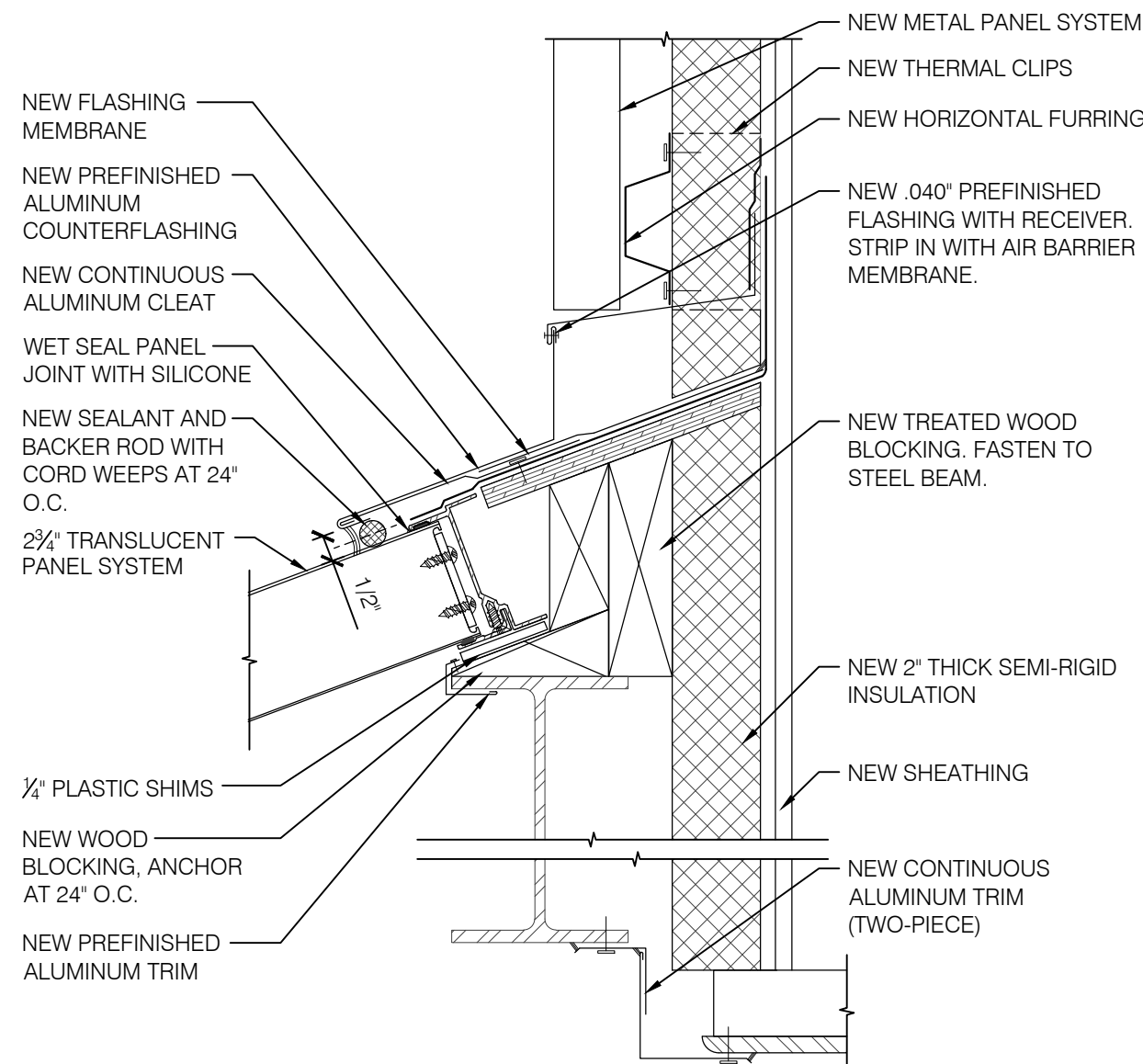
END OF SECTION 08 45 23

Plotted: 10/5/2018 11:49 AM by Chaijenkai, Tanya File Name: P:\2018\2018.0xxx\2018.0772.0 - TRIPHAWN CENTER ROOF REPLACEMENT RFQ (PS)\Drawings\Roof Replacement.dwg

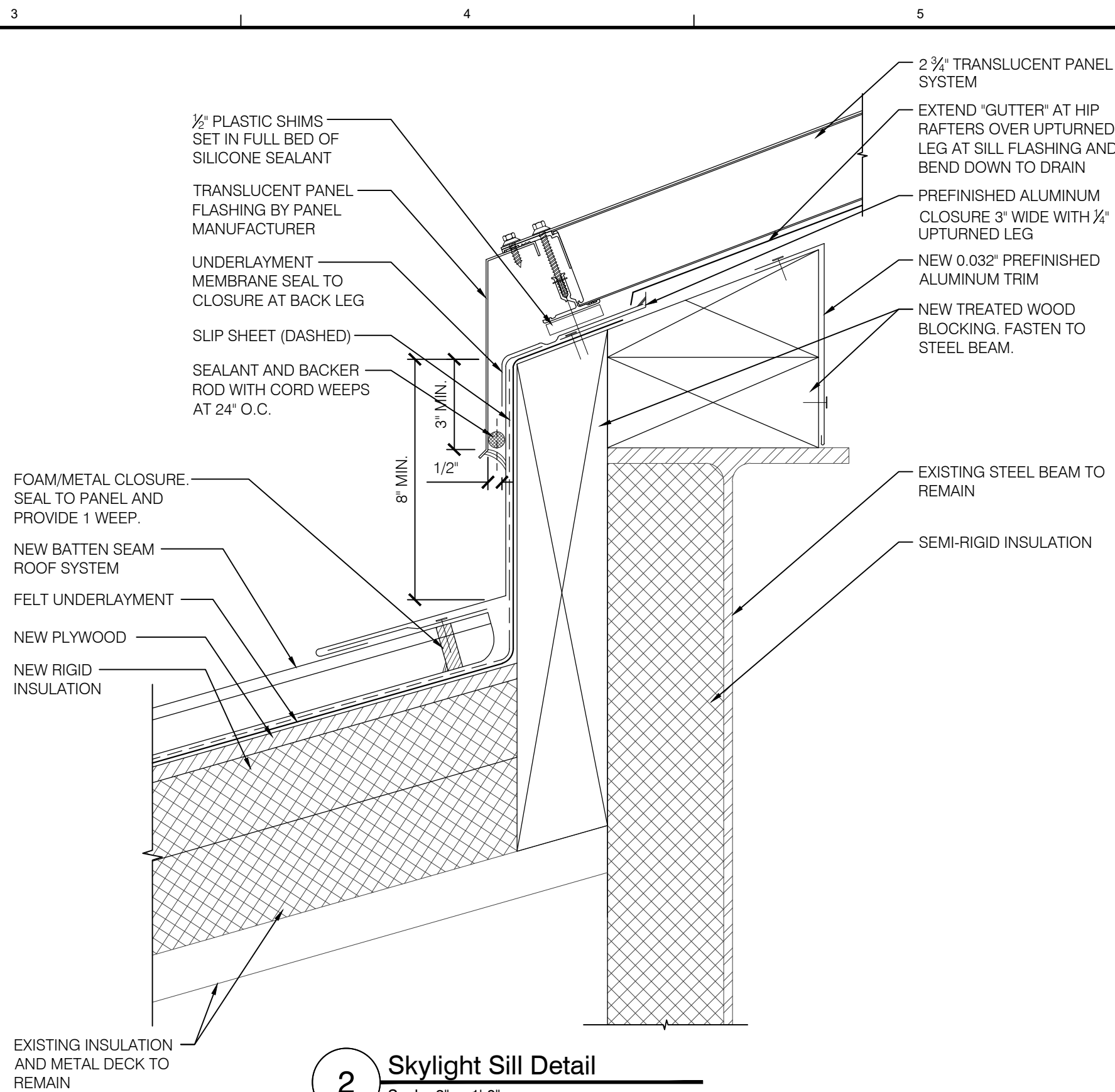
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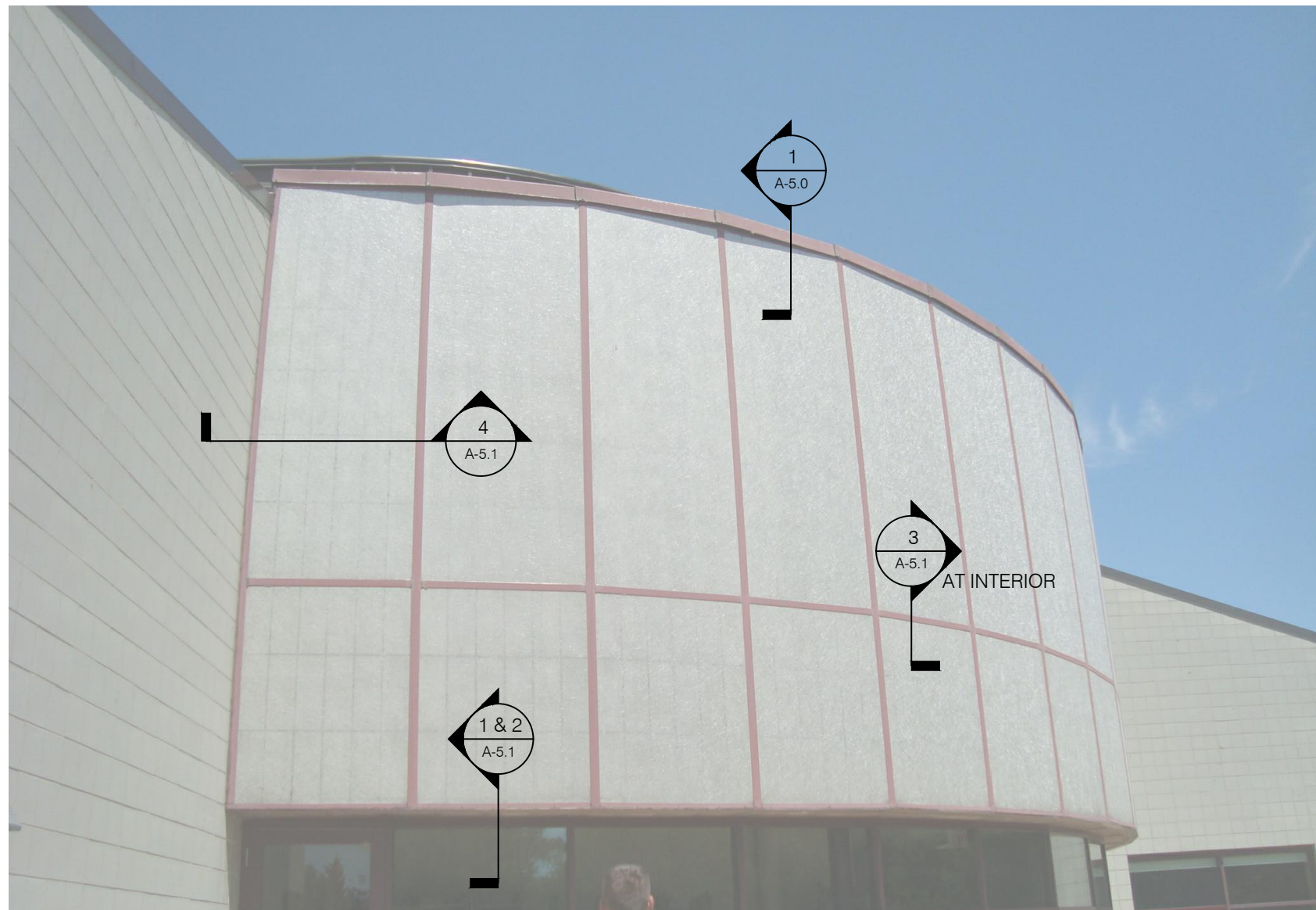
1 Wall Head Detail
Scale: 6" = 1'-0"



3 Skylight Head Detail
Scale: 3" = 1'-0"



2 Skylight Sill Detail
Scale: 3" = 1'-0"



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Princeton | San Francisco | Seattle | Washington, D.C.

Project

**Triphahn Center
Roof Replacement**

1685 West Higgins Road
Hoffman Estates, IL 60169

Client

**Hoffman Estates
Park District**

1685 West Higgins Road
Hoffman Estates, IL 60169

△	10.5.18	Addendum No. 1
	9.17.18	Issued for Bid
Mark	Date	Description

Project No.	2018.0772
Date	October 5, 2018
Drawn	TC
Checked	PS / RAW
Scale	As Shown

**Translucent Panel
Details**

Sheet Title

Sheet No.

A-5.0