

PROJECT MANUAL
ROOF REPLACEMENT AT TRIPHAHN CENTER
1685 WEST HIGGINS ROAD
HOFFMAN ESTATES, ILLINOIS



WJE No. 2018.0722

September 17, 2018

Architect/Engineer
WISS, JANNEY, ELSTNER ASSOCIATES, INC.
330 Pfingsten Road
Northbrook, Illinois 60062-2095
(847) 272-7400

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SECTION 00 01 15
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END OF SECTION

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INVITATION TO BID

PROJECT: Roofing and Translucent Wall Panel Replacement at
Hoffman Estates Park District - Triphahn Center
1685 West Higgins Road
Hoffman Estates, Illinois
WJE No. 2018.0772

OWNER: Hoffman Estates Park District
1685 West Higgins Road
Hoffman Estates, Illinois 60169

OWNER'S REPRESENTATIVE:
Mr. Dustin Hugen
Director of Parks and Facility Services
Hoffman Estates Park District
Telephone: (847) 285-5465
Email: dhugen@heparks.org

ARCHITECT: Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois
Telephone: 847.272.7400
Attn: Pat Shaughnessy, email: pshaughnessy@wje.com

MANDATORY PRE-BID MEETING:

September 20, 2018
10:00 AM
Triphahn Center, North Entrance

BID DUE: October 10, 2018, 10:00 AM

Submit sealed bids labeled "Triphahn Center Roofing and Translucent Panel Replacement" by the bid due date listed above to:

Hoffman Estates Park District
Triphahn Center
1685 West Higgins Road
Hoffman Estates, Illinois 60169

SUMMARY OF THE WORK:

Sloped Roof Areas:

- A. Remove batten seam roofing system and underlayment to existing insulation.

- B. Install new 3 inch polyisocyanurate/ 3/4" plywood composite nailbase over existing insulation.
- C. Install new 30 pound felt underlayment over surface and waterproof underlayment at the eaves, walls, and at penetrations.
- D. Install red rosin sized paper slip sheet over underlayment surface.
- E. Install new 24 gauge galvanized steel, Kynar finished, snap-on batten seam metal roof system.
- F. Install new flush seam metal wall panels at vertical surfaces.
- G. Install new suspended gutter and downspouts at base of sloped roof areas.

Translucent Fiberglass Panels:

- A. Remove translucent skylight and wall panels and blocking to existing framing.
- B. Install new blocking and interior trim to conceal blocking.
- C. Install new translucent skylight panels and associated trim.
- D. Install new translucent wall panels.
- E. Install new soffit panels at the base of the translucent wall panels.

Steep Slope PVC Roofing In Lieu of Metal Panel Roofing (Alternate 1)

- A. Remove metal roofing to existing insulation.
- B. Install new 2-1/2 inch polyisocyanurate insulation and 1/2 inch DensDeck prime coverboard.
- C. Fully adhere a 60 mil PVC fleece back membrane with simulated standing seams.
- D. Install new flush seam metal wall panels at vertical surfaces.
- E. Install new suspended gutter and downspouts at base of sloped roof areas.

Low Slope Roofing (Alternate 2)

- A. Remove PVC roofing to structural roof deck
- B. Mechanically fasten substrate board to metal roof deck.
- C. Install self-adhered vapor retarder.
- D. Install R-30 polyisocyanurate insulation in urethane adhesive.
- E. Install gypsum cover board in urethane adhesive.
- F. Install fully adhered 60 mil PVC membrane and associated flashings.
- G. Install new polyisocyanurate insulation in foam adhesive.
- H. Install new sheet metal flashings and counterflashings.

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 AIA DOCUMENT A701-1997

- A. Refer to AIA Document A701-1997, Instructions to Bidders. Free sample previews of the document are available at www.aiacontracts.org.
- B. Supplemental Instructions
 - 1. Add following subparagraphs.
 - 2.1.3.1 Bidder is responsible for verifying visible conditions, including dimensions, materials, and attachments to remain, on existing facility. Existing conditions shown on Drawings are for information only and must be verified in field.
 - 2.1.3.2 Schedule site visits by contacting Mr. Dustin Hugen, (847) 285-5465.
 - 4.1.8 Bidders shall include time to start and length of construction period, in calendar days, for Base Bid and each Alternate.
 - 4.2.1.1 Bid security shall be 10 percent of Base Bid Total amount, in form of surety bond or cashier's check.
 - 4.2.1.2 Bidder shall execute Owner-Contractor Agreement within ten days of receipt of notice of bid acceptance and shall furnish required bonds and insurance certificates to Owner within three days thereafter, or bid security shall be forfeited to Owner as liquidated damages.
 - 4.2.2.2 Use AIA Document A310-1970 or another pre-approved form for bid bond. Bid-bond surety company is subject to Owner's approval.
 - 4.2.3.1 Bid security will be returned to all except three lowest bidders within three working days after bid opening.
 - 4.2.3.2 Remaining bid securities will be returned promptly after Owner and accepted Bidder have executed Owner-Contractor Agreement. Bidder may request return of bid security 60 days after Bid Due date if Bidder has not been notified of acceptance of Bidder's Bid.
 - 7.1.1.1 Provide performance and payment bonds for Contract Amount.

END OF SECTION

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. _____ Dated: _____
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.	

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

SUMMARY PORTION OF BID

Bid Total (Sum of Subtotals L1 through L3): \$ _____

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

HOFFMAN ESTATES PARK DISTRICT
Hoffman Estates, Illinois

FORM OF PROPOSAL

Proposal of _____, hereinafter called the
"BIDDER", (a) / (an) _____,
(Corporation, Partnership,
individual) doing business as _____, to Hoffman Estates
Park District, hereinafter called the "OWNER."

* * *

The Bidder, in response to your advertisement for bids for _____
_____ having examined the Specifications and other Documents
and being familiar with all of the conditions surrounding the proposed work (purchase/sale)
including availability of materials hereby proposes to furnish all materials and supplies and to
construct the project in accordance with the Contract Documents, within the time set forth
therein and at the prices stated below. These prices are to cover all expenses incurred in
performing the work required under the Contract Documents of which this proposal is a part.

Bidder acknowledges receipt of the following Addenda, which are a part of the Contract

Document Numbers: _____, _____, _____, _____.

HOFFMAN ESTATES PARK DISTRICT

BY: _____
(Sign and Date)

BY: _____
(Sign and Date)

FIRM NAME _____

ADDRESS _____

PHONE _____

EMAIL: _____

BY: _____
(Sign and Date)

Accompanying this is a _____
(Bid Bond, Certified Check, Bank Draft)

In the amount of _____
(Dollars)

(\$_____) being five percent (5%) of the Base Contract Bid, the same being subject to forfeiture in the event of default by the undersigned.

In submitting this bid, it is understood that the right is reserved by the Owner to reject any and all bids and it is agreed that this bid may not be withdrawn during the period of days in the Contract Documents.

The Bidder hereby certifies:

- A. That this bid is genuine and is not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation.
- B. That he has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid.
- C. That he has not solicited or induced any person, firm, or corporation to refrain from bidding.
- D. That he has not sought by collusion or otherwise to obtain for himself any advantage over any other bidder or over the "Owner."
- E. That he will comply with all provisions of the Prevailing Wage Ordinance #O-17-04 adopted by the Hoffman Estates Park District.
- F. That he is in compliance with the Criminal Code Act of 1961, Article 33E-11, Public Contracts, and Public Act 85-1295.
- G. That all materials, methods and workmanship shall conform to the drawings, specifications, manufacturer's standards and specifications, and all applicable Codes and Standards.
- H. The bidder understands that the Hoffman Estates Park District looks favorably on minority businesses as sub-contractors for supplies, equipment, labor services and construction.

FORM 1 – BID

CERTIFICATION

I, _____ (Officer), having been first duly sworn on Oath, do depose and state that I presently reside at _____ (Address), and that I am the duly authorized principal, officer or agent of _____ (Name of Contractor) and do hereby certify to Hoffman Estates Park District, its Commissioners, Officers and Employees that neither I nor _____ (Name of Contractor) are barred from bidding on the Contract for which this bid is submitted, and as a result of violation of either Section 33E-3 (Bid-rigging") or Section 33E-4 ("Bid-rotating") of Article 33E of the Criminal Code of 1961 of the State of Illinois approved July 28,1961, as amended.

On behalf of Contractor

Subscribed and sworn to before me

this _____ day of _____, 20____

- Notary Public -

My Commission Expires:

REFERENCES

Hoffman Estates IL 60169

References for:

1.

Company Name:

Address:

City-state:

Phone Number:

Contact Person:
2.

Company Name:

Address:

City/State:

Phone Number:

Contact Person:
3.

Company Name:

Address:

City/State:

Phone Number:

Contact Person:
4.

Company Name:

Address:

City/State:

Phone Number:

Contact Person:

SUSTAINABILITY STATEMENT

Introduction

The Hoffman Estates Park District is committed to green and sustainable practices and good environmental stewardship. Consequently, we are asking bidders to provide a Statement of Sustainability to ensure our bidders are also incorporating sustainability into their firm’s practices.

Instructions

Provide a clear description of your firm’s sustainable practices, policies or procedures to the below sections or attach a copy of your practice. These practices may include but are not limited to:

Waste Minimization within the office or facilities through recycling programs, double-sided copying, electronic internal communications, recycled content in materials, reusable cups, limited printing, electronic document management, green purchasing policies, green cleaning supplies or reduced packaging in materials procured or supplied. _____

Energy Efficiency within office, facilities or firm through lighting retrofits, photo sensor switches for lighting, use of day lighting, Energy Star rated appliance or equipment, alternative fuel or efficient fleet, anti-idling policy, or indoor temperature management. _____

Water Efficiency in office, facilities or firm through faucet or fixture retrofits, switch individual bottled water to office water coolers or drinking fountains, drought tolerant landscaping. _____

Staff are encouraged to be sustainable and supported by your firm through public transit benefits, bicycle accommodations, telecommuting options, support to attend green seminars, US Green Building Council LEED accredited or the creation of an internal green team. _____

Education of your staff about green practices, your business peers of your green accomplishments, your community of your sustainability, or any environmental awards your firm has achieved. _____

_____.

SECTION 00 52 14
AGREEMENT FORM

PART 1 GENERAL

1.1 AGREEMENT FORM

- A. Owner/Contractor Agreement form is AIA Document A101-2017, Standard Form of Agreement Between Owner and Contractor. Free sample previews of the document are available at www.aiacontracts.org.
- B. Terms *Architect*, *Engineer*, and *Architect/Engineer* are used interchangeably.

END OF SECTION

SECTION 00 60 11

BONDS AND CERTIFICATES

PART 1 GENERAL

1.1 BONDS AND CERTIFICATES

- A. Furnish the following with executed Owner-Contractor Agreement.
 - 1. Performance and Payment Bonds: Use AIA Document A312-2010, Performance Bond and Payment Bond, or another pre-approved form.
 - 2. Certificates of Insurance: Use ACORD 25 (2016/03), Certificate of Liability Insurance, and ACORD 27 (2009/12), Certificate of Property Insurance, with AIA Document G715-2017, Supplemental Attachment, or another pre-approved form.
- B. Bond Surety Company shall be satisfactory to Owner.
- C. Include costs for bonds and insurance in Bid.
- D. Attorneys-in-Fact who sign bonds shall file with each bond a certified copy of their Power of Attorney, with effective date.

END OF SECTION

SECTION 00 72 00
GENERAL CONDITIONS

PART 1 GENERAL

1.1 GENERAL CONDITIONS

- A. General Conditions are AIA Document A201-2017, General Conditions of the Contract for Construction. Free sample previews of the document are available at www.aiacontracts.org.

END OF SECTION

SECTION 00 73 00
SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

1.1 SUPPLEMENTARY CONDITIONS

- A. The following supplementary conditions modify provisions of AIA Document A201-2017, General Conditions of the Contract for Construction. Free sample previews of the document are available at www.aiacontracts.org. Unaltered portions of General Conditions remain in effect.

Article 1 General Provisions

Add Subparagraphs 1.1.3.1, 1.1.3.2, 1.1.3.3, and 1.1.3.4.

*1.1.3.1 **Furnish:** Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.*

*1.1.3.2 **Install:** Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.*

*1.1.3.3 **Provide:** Furnish and install, complete and ready for intended use.*

*1.1.3.4 **Rules and Regulations** shall include conventions and agreements within construction industry that control performance of Work.*

Add Subparagraph 1.2.4.

1.2.4 Sections of Division 01 - General Requirements expand on provisions of these General Conditions and govern the execution of the Work of all sections of the Specification.

Add Subparagraph 1.4.1.

1.4.1 Where phases such as "as selected," "as approved," "or equal," or "or approved equal" are used, it is understood that the selecting or approving party is the Architect/Engineer, unless another is party specifically designated by the Owner.

Add Subparagraph 1.5.3.

1.5.3 Any unauthorized use of the Instruments of Service by the Contractor, Subcontractors, Sub-subcontractors, or suppliers shall be at that party's sole risk and that party shall indemnify Architect/Engineer for any liability or legal exposure to Architect/Engineer related to the unauthorized use.

Delete Paragraphs 1.7 and 1.8 and add the following:

1.7 —Not Used—

1.8 —Not Used—

Article 2 Owner

Delete Subparagraph 2.3.2 and add the following:

2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number. The terms "Architect," "Architect/Engineer," and "Engineer" are used interchangeably.

Article 3 Contractor

Add Subparagraph 3.1.4.

- 3.1.4 *The Contractor is responsible for all obligations related to the Work unless the obligation is specifically attributed to the Owner.*

Add the following to Subparagraph 3.2.2.

- 3.2.2.1 *The Contractor shall not scale drawings to determine dimensions. It is the Contractor's responsibility to verify all field dimensions or request additional information from the Architect when areas cannot be field measured.*

- 3.2.2.2 *The Contractor shall report to the Architect/Engineer any specified Work that, in the opinion of the Contractor, cannot reasonably be constructed as specified.*

Delete Subparagraph 3.5.2 and add the following.

- 3.5.2 *All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner or shall be transferrable to the Owner, shall commence in accordance with Section 9.8.4, and shall not be limited by the period for correction of work established in Paragraph 12.2.*

Add Subparagraph 3.6.1.

- 3.6.1 *The Owner is a tax-exempt organization and is exempt from sales tax on products permanently incorporated in the Work. When making purchases, the Contractor shall certify in writing on the invoice or sales ticket copy to be retained by the vendor that purchases were made for and on behalf of the Owner. The Contractor shall furnish copies of the invoices or sales tickets to the Owner and shall provide separate amounts for labor and materials on the monthly payment requests."*

Article 4 Architect

Delete Subparagraph 4.1.2 and add the following.

- 4.1.2 *Duties, responsibilities, and limitations of authority of the Architect/Engineer as set forth in the Contract Documents may be restricted, modified, or expanded by the Owner and Architect/Engineer without the consent of the Contractor. The Contractor shall be notified of any changes to the duties, responsibilities, or limitations of authority of the Architect/Engineer.*

Article 5 Subcontractors

Add Subparagraph 5.3.1.

- 5.3.1 *Each Subcontractor shall indemnify and hold harmless the Owner, Architect/Engineer, Architect/Engineer's consultants, and agents and employees of any of them, per Paragraph 3.18, to the extent of the Work to be performed by the Subcontractor.*

Article 9 Payments and Completion

Add Subparagraph 9.3.4.

- 9.3.4 *The application for payment form shall be AIA Document G702-1992, Application and Certification for Payment (or a similar form agreed upon by the Owner and Architect), supported by AIA Document G703-1992, Continuation Sheet (or a similar form agreed upon by the Owner and Architect). The first payment application shall include the Contractor's partial waiver of lien for the payment amount. Each subsequent payment application shall include the Contractor's partial waiver of lien for the payment amount and partial waivers of lien of Subcontractors and material suppliers who were included in the immediately preceding payment application, to the extent of that payment. The application for final payment shall include final waivers of lien from the Contractor, Subcontractors, and material suppliers who have not previously furnished final waivers.*

Article 10 Protection of Persons and Property

Add the following to Subparagraph 10.2.6.

The responsible person shall conduct regularly scheduled meetings with Subcontractors and, in the event of Separate Contracts, with other Contractors to promote compliance with governing safety regulations.

Add Paragraph 10.5 including Subparagraphs 10.5.1 and 10.5.2.

10.5 Use and Control of Moisture

10.5.1 The Contractor shall control moisture from construction activities or due to temporary demolition during construction and prevent such moisture from creating or contributing to conditions conducive to deterioration of materials or biological growth. This includes providing temporary weather protection of work areas to reasonably prevent weather from entering the interior or damaging components to remain.

10.5.2 The Contractor shall control water runoff and shall not allow contaminated water or debris to enter storm sewers. The Contractor shall comply with local, state, and federal laws and ordinances regarding water runoff.

Article 11 Insurance and Bonds

Add Subparagraph 11.1.4.

11.1.4 Within three (3) business days of the date the Contractor becomes aware of any impending or actual cancellation of any insurance or substantial change in coverage required by Section 11.1, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide the required coverage throughout the project duration (including statute of limitations period). Upon receipt of the notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. Alternately, the Owner shall have the right, but not the obligation, to independently obtain such insurance. In such case, the Contractor shall repay the Owner immediately upon demand the premium together with interest and all costs and expenses incurred by the Owner without prejudice to any rights or remedies of the Owner under this Agreement. At the Owner's option, all sums due the Owner may be deducted from payments due to the Contractor under this Agreement.

Article 12 Uncovering and Correction of Work

Modify Subparagraphs 12.2.2.1, 12.2.2.2, and 12.2.2.3 as follows:

12.2.2.1 Change "one year" to "two years" at one location in Line 1. Change "one-year" to "two-year" at one location in Line 7.

12.2.2.2 Change "one-year" to "two-year" at one location in Line 1.

12.2.2.3 Change "one-year" to "two-year" at one location in Line 1.

Modify Subparagraph 12.2.5 as follows:

12.2.5 Change "one-year" to "two-year" at one location in Line 2.

Add Paragraph 12.4.

12.4 In addition to complying with the requirements of the Contract Documents, the completed Work shall be watertight (i.e., no liquid water inboard of the primary waterproofing, roofing, and/or weather barrier element) for the correction period. In executing the Owner-Contractor Agreement, the Contractor represents that it is knowledgeable in the Work to be performed.

It is the responsibility of the Contractor to take any and all steps necessary to provide a watertight system. Errors, inconsistencies, or omissions in the Contract Documents or unanticipated field conditions shall be reported promptly to the Architect/Engineer under Paragraph 3.2.2, and do not relieve the Contractor of its responsibility to provide a watertight system.

Article 13 Miscellaneous Provisions

Add the following to Paragraph 13.6.

Interest shall not accrue on disputed amounts due until the Owner and Contractor have resolved such dispute.

Article 14 Termination or Suspension of the Contract

Delete Subparagraph 14.1.1.3 and substitute the following.

14.1.1.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Subparagraph 9.4.1, or because the Owner has not made payment on a Certificate for Payment certified by the Architect that is undisputed by the Owner within the time stated in the Contract Documents; or

- B. The following supplementary conditions modify provisions of AIA Document A101-2017 Exhibit A, Insurance and Bonds. Unaltered portions remain in effect.

Add the following after Subparagraph A.3.2.1:

Maintain products-completed operations coverage through statute of limitations for any Project-related claims, including warranty claims.

Add the following Subparagraph A.3.2.2.3:

General Aggregate and Per Project Aggregate endorsements shall be added to the General Liability policy.

A.3.2.2.1 Commercial General Liability \$1,000,000 each occurrence; \$2,000,000 general aggregate; \$2,000,000 aggregate for products-completed operations hazard

A.3.2.3 Automobile Liability \$1,000,000 per accident

A.3.2.6 Employer's Liability \$1,000,000 each accident; \$1,000,000 each employee; \$1,000,000 policy limit

END OF SECTION

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Description of existing conditions and Contractor duties and use of premises.

1.2 OWNER/CONTRACTOR AGREEMENT

- A. Perform Work under terms of A201 - General Conditions of the Contract for Construction, and Section 00 73 00 - Supplementary Conditions.
- B. Owner: Hoffman Estates Park District
- C. Architect/Engineer: Wiss Janney Elstner Associates
330 Pfingsten Road
Northbrook, Illinois 60062

1.3 CONTRACTOR DUTIES

- A. Except as specifically noted, provide and pay for:
1. Labor, materials, and equipment.
 2. Tools, construction equipment, and machinery.
 3. Water, heat, power, and lights required for construction.
 4. Other facilities and services necessary for proper execution and completion of Work.
 5. Legally required sales, consumer, and use taxes. Owner's tax-exempt sales tax number is E9998-0150-07.
 6. Permits, government fees, and licenses as necessary for proper execution and completion of Work and as applicable at time of receipt of bids.
- B. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities having jurisdiction, which bear on performance of Work.
1. Take necessary safety precautions to prevent injury to construction personnel, non-construction personnel, Owner's property, and adjacent facilities.
 2. Give required notices.
 3. Products shall comply with local regulations, including environmental restrictions.
 4. Promptly submit written notice to Architect/Engineer of observed variance of Contract Documents from legal requirements. It is not the Contractor's responsibility to make certain that Drawings and Specifications comply with codes and regulations.
 - a. Propose appropriate modifications to Contract Documents for necessary changes.
 - b. Assume responsibility for Work known to be contrary to such requirements, which is performed without notice.
- C. Enforce strict discipline and good order among employees. Do not employ unfit persons or persons not skilled in their assigned tasks.
- D. Provide 24-hour emergency contact information for Contractor and major subcontractors, including names and telephone numbers.

1.4 CONTRACTOR USE OF PREMISES

- A. Confine operations at Site to areas permitted by law, ordinance, permits, and Contract Documents.
- B. Owner will occupy premises outside of Work area during construction period.
 - 1. Cooperate with Owner to minimize conflicts and facilitate Owner usage.
 - 2. Perform Work to avoid interference with Owner's day-to-day operations. Notify Owner's Representative at least 72 hours in advance of activities that will affect Owner's operations.
 - 3. Maintain vehicular, pedestrian, and emergency access to portions of facility that are in use. Keep entrances and exits clear of stored materials and construction equipment.
 - a. Short interruptions in access may be permitted if approved in advance in writing by the Owner's Representative.
 - b. Schedule deliveries to minimize interruptions.
 - 4. Do not disturb Site outside of Work area.
- C. Minimize interference with adjacent streets and walkways and adjacent facilities.
- D. Contractor shall have no additional storage or operational area outside of Work area, either inside or outside of building, except as approved in advance by Owner's Representative.
 - 1. Construction equipment, tools, etc., shall not be stored in areas of Owner's continued use.
 - 2. Do not unreasonably encumber Site with materials or equipment.
 - 3. Do not load Project structure with weight that will endanger Project structure.
 - 4. Assume full responsibility for Site security and protection and safekeeping of products stored at Site.
 - 5. Obtain and pay for additional storage areas needed for operations.

1.5 OWNER OCCUPANCY

- A. Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 01 20 10

CONTRACT MODIFICATION AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for preparing, handling, and processing Contract modifications and Applications for Payment, including allowances, unit price Work, alternates, and product substitutions.

1.2 UNIT PRICE WORK

- A. Definition: Unit price, stated on the Bid Form, is the price per unit of measurement for materials and services for a specific Work activity. The Contract Sum may be increased or decreased by Unit Price adjustment, based on the difference between the estimated bid quantity and the actual Work quantity.
- B. Measurement Procedures:
 - 1. Measure Work performed on a unit price basis and maintain a record of the location and unit price quantity of each repair installed. Unless stated otherwise by the Architect/Engineer, document unit price quantities with plan view or elevation drawings, or both, and tables with required data, cross-referenced to drawings. Submit recorded information to Architect/Engineer on a weekly basis.
 - 2. Architect/Engineer will verify the accuracy of measurements and approve final quantities. Notify Architect/Engineer at least two days before Work will be performed that might make this verification difficult or impossible.
 - 3. Notify Owner's Representative and Architect/Engineer at once in writing of unit price work that deviates materially from the Unit Price basis for payment and for which an adjustment in Unit Price is desired.
 - a. Measure and quantify all such deviations, and allow Architect/Engineer to verify the accuracy of measurements, prior to performing Work that might make verification difficult or impossible.
 - b. Adjustments will be considered only if all repairs of given type have been measured and all deviations, both plus and minus, have been included in the determination of the average deviation from the Unit Price basis for payment.
- C. Payment Procedures:
 - 1. As part of Project closeout, the Contract Sum will be modified by the unit price times the variation in the actual Work quantity from the estimated quantity included in the Bid Form, based on quantities measured by the Contractor and approved by the Architect/Engineer.

1.3 ALTERNATES

- A. Description of Alternates:
 - 1. Alternate 1: Removal of existing metal roofing and installation of a new 60 mil fleece back PVC roofing system that utilizes simulated PVC standing seams.
 - 2. Alternate 2: Removal of the low slope PVC roofing system to the structural deck and installation of a new 60 mil, fully adhered roofing system.

B. Procedures:

1. Upon notification of alternates selected by the Owner, inform subcontractors of selected alternates and of changes in the Work due to selection or rejection of alternates.
2. Execute accepted alternates under the same conditions as other work of the Contract.
3. Modify or adjust affected adjacent Work as necessary to completely integrate the Work of an alternate into Project.

1.4 SUBSTITUTION PROCEDURES**A. Definitions:**

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

B. Submittals:

1. Substitution Requests: Submit three copies of request for consideration. Use CSI Form 13.1A or similar form. Identify product or fabrication or installation method to be replaced. Include Specification section and Drawing numbers and titles.
 - a. Provide the following information. If the following information is not provided, Architect/Engineer may return requests without action, except to record noncompliance with these requirements.
 - 1) Statement indicating why specified product, fabrication, or installation cannot be provided, if applicable.
 - 2) Product Data, including drawings and descriptions of products, and fabrication and installation procedures. Where applicable or requested, include:
 - a) Samples.
 - b) Certificates and qualification data.
 - 3) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - a) Research reports evidencing compliance with the building code in effect for Project.
 - b) Necessary approvals of public authorities having jurisdiction.
 - 4) A detailed comparison of significant qualities of proposed substitution with those of specified Work. Include an annotated copy of applicable Specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from specified Work.
 - 5) List of similar installations for completed projects with project names and addresses and names and addresses of architect/engineers and owners.
 - 6) Coordination information, including a list of changes or modifications needed to other portions of Work that will be necessary to accommodate proposed substitution.
 - 7) Cost information and a detailed comparison of Contractor's construction schedule using proposed substitution compared to specified product, including

- the effect on overall Contract Time. Include proposal of change, if any, in Contract Sum or Contract Time.
- 8) Contractor's certification that proposed substitution complies with requirements in Contract Documents, including specified warranty, except as indicated in substitution request; is compatible with other portions of Work and other products; and is appropriate for applications indicated and will produce indicated results.
 - a) Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturer.
 - 9) Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of the proposed substitution to produce the indicated results.
 - b. In addition, for substitutions of convenience, requested substitution must:
 - 1) Offer Owner substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect/Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - 2) Not require extensive revisions to Contract Documents.
 - c. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not less than 14 days prior to time required for preparation and review of related submittals.
 - d. Substitutions for Convenience: Not allowed.
 - e. Substitutions for Convenience: Architect/Engineer will consider requests for substitution if received within 60 days after Notice of Award. Requests received after that time may be considered or rejected at the discretion of Architect/Engineer.
 2. Architect/Engineer's Action: If necessary, Architect/Engineer will request additional information or documentation for evaluation within seven days of receipt of substitution request. Architect/Engineer will notify Contractor of acceptance or rejection of proposed substitution within 14 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Acceptance or rejection of proposed substitutions shall be at the sole discretion of Architect/Engineer, whose decision is final.
 - b. Accepted substitution will be incorporated into the Contract by Change Order, Construction Change Directive, or Architect/Engineer's Supplemental Instructions for minor changes in Work.
 - c. Use product specified if Architect/Engineer does not issue decision on use of proposed substitution within time allocated.

C. Modify or adjust Work as necessary to integrate work of approved substitutions.

1.5 CONTRACT MODIFICATION PROCEDURES

- A. Minor Changes in Work: Architect/Engineer will issue supplemental instructions authorizing minor changes in Work, not involving adjustment to Contract Sum or Contract Time, on AIA Document G710, Architect's Supplemental Instructions.
- B. Proposal Requests:

1. Owner-Initiated Proposal Requests: Architect/Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or Contract Time. The description may include supplemental or revised Drawings and Specifications.
 - a. Proposal Requests issued by the Architect/Engineer are for information only, and are not instructions to either stop Work or execute the proposed change.
 - b. Within the time specified in the Proposal Request after receipt of the Proposal Request, submit adjustments to the Contract Sum and Contract Time necessary to execute change.
2. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, propose changes by submitting a request for change to the Architect/Engineer.
 - a. Include a statement outlining reasons for the change and provide a complete description of the proposed change.
 - b. Submit adjustments to the Contract Sum and Contract Time necessary to execute the change within 21 days of becoming aware of latent or unforeseen condition. Owner will reject claims submitted later than 21 days after latent or unforeseen condition becomes known.
3. Indicate the effect of the proposed change on the Work, and adjustments to the Contract Sum and Contract Time necessary to execute the change.
 - a. Include quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Do not include Contractor's or subcontractor's indirect expense unless it is clearly shown that the nature or extent of Work has changed from that which could have been foreseen from information in the Contract Documents. No change to Contractor's indirect expense is permitted for the selection of higher- or lower-priced materials, or systems of the same scope and nature as originally indicated.
 - e. Include an updated Construction Schedule that indicates the effect of the change, including changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of Contract Time.
 - f. Comply with requirements in Section 01 60 00 if proposed change requires substitution of one product or system for product or system specified.
4. Use AIA Document G709, Work Changes Proposal Request, for Proposal Requests.

C. Construction Change Directives:

1. Architect/Engineer may issue a Construction Change Directive on AIA Document G714, Construction Change Directive, instructing Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - a. A Construction Change Directive contains a complete description of the change in Work, including a method to determine changes in the Contract Sum and Contract Time.
2. Maintain detailed records on time and material basis of Work required by Construction Change Directive.
 - a. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

D. Change Order Procedures:

1. Owner will authorize a change in the Contract by executing AIA Document G701, Change Order.
2. Allowance Adjustment: Change Orders for allowance items will decrease allowance amounts, and have no effect on Contract Amount, until the allowance amount has been depleted.
 - a. If requested, prepare an explanation and documentation to substantiate distribution of overhead costs and other margins claimed.

1.6 PAYMENT PROCEDURES

A. Schedule of Values:

1. Format and Content:
 - a. Include the following Project identification.
 - 1) Project name and location.
 - 2) Name of Architect/Engineer.
 - 3) Contractor's name and address.
 - 4) Date of submittal.
 - b. Provide a breakdown of the Contract Sum in sufficient detail to facilitate an evaluation of the Applications for Payment.
 - 1) Coordinate with Project Manual Table of Contents.
 - 2) Provide separate line items for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of Work.
 - 3) Provide separate line item for each part of Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - 4) Where Work is phased, include effects of phasing in Schedule of Values.
 - 5) Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - 6) Show temporary facilities and other major cost items that are not a direct cost of actual Work-in-place, as either separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
 - 7) Round amounts to nearest whole dollar; total shall equal Contract Sum.
2. Coordinate the Schedule of Values with other administrative forms and schedules, including the Construction Schedule, submittal schedule, and application for payment forms.
3. Submit the Schedule of Values to Architect/Engineer at least two weeks before submittal of the initial Application for Payment.
4. Update and resubmit the Schedule of Values before the next Application for Payment when a Change Order results in a change in the Contract Sum.

B. Applications for Payment:

1. Payment Application Form: Use AIA Document G702 and AIA Document G703 Continuation Sheets as the form for Applications for Payment.
2. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect/Engineer and paid by Owner.
3. Application Preparation: Complete every entry on form. Notarize and execute by person authorized to sign legal documents on behalf of Contractor. Architect/Engineer will return incomplete applications without action.
 - a. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedule if revisions were made.

- b. Include amounts of Change Orders and Construction Change Directives issued before the last day of the construction period covered by the application.
- 4. Submittal: Submit **three** signed and notarized original copies of each Application for Payment to Architect/Engineer by method ensuring receipt. One copy shall include waivers of lien and similar attachments if required. Send the submittal with a transmittal form listing attachments and recording appropriate information about the application.
- 5. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file mechanic's lien arising out of the Contract and related to the Work covered by payment.
 - a. Submit partial waivers on each item for the amount requested in the application, after deduction for retainage on each item.
 - b. When the application shows completion of an item, submit final or full waiver.
 - c. Execute waiver forms in a manner acceptable to Owner.
 - d. Owner reserves the right to designate which entities involved in Work must submit waivers.
- 6. Application for Payment at Substantial Completion: After issuing a Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of Work claimed as substantially complete.
 - a. Include documentation supporting claim that Work is substantially complete and statement showing accounting of changes to Contract Sum.
 - b. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of Work.
- 7. Final Payment Application: Submit a final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
 - a. Evidence of completion of Project closeout requirements.
 - b. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 - c. Updated final statement, accounting for final changes to the Contract Sum.
 - d. AIA Document G706, Contractor's Affidavit of Payment of Debts and Claims.
 - e. AIA Document G706A, Contractor's Affidavit of Release of Liens.
 - f. AIA Document G707, Consent of Surety to Final Payment.
 - g. Evidence that claims have been settled.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Project coordination and supervision, meetings, schedules, and photographic documentation.

1.2 COORDINATION

- A. Project has special requirements for coordinating Work because of the following conditions.
 - 1. Complex nature and phasing of Work activities.
 - 2. Partial occupancy of facility by Owner during construction period.
- B. Provide supervision, planning, scheduling, and control to perform Work and meet requirements of Contract Documents.
 - 1. Schedule and coordinate construction operations in sequence required to obtain best results where installation of one part of Work depends on installation of other components, before or after its own installation.
 - 2. Notify affected parties in writing, as necessary, of special procedures required for coordination.
 - 3. Coordinate scheduling and timing of required administrative procedures to ensure orderly progress of Work. Such administrative activities include the following:
 - a. Preparation of a construction schedule and Schedule of Values.
 - b. Installation and removal of temporary facilities and controls.
 - c. Delivery and processing of submittals.
 - d. Progress and pre-installation meetings.
 - e. Project closeout activities.
- C. Notify the Owner's Representative in writing 48 hours in advance of time when construction areas will be returned to the Owner for use or when new Work areas are required.
- D. Submit a building access plan to Owner's Representative for review and written approval at least ten working days prior to its implementation. Include locations of temporary enclosures and storage.

1.3 SUPERVISION

- A. Provide a project superintendent at the Site a minimum of eight hours per day during the progress of the Work. The superintendent shall be literate and fluent in English.

1.4 MEETINGS

- A. General:
 - 1. Schedule and conduct meetings at the Site, unless otherwise indicated.
 - 2. Notify participants, others involved, and individuals whose presence is required, of the date and time of the meeting. Notify the Owner and Architect/Engineer of scheduled meeting dates and times.

3. Agenda: Prepare a meeting agenda and distribute agenda to invited attendees.
4. Minutes: Architect/Engineer will record significant discussions, agreements, and disagreements, and distribute the meeting minutes to concerned parties, including the Owner and Architect/Engineer, within seven days of the meeting.

B. Pre-Construction Meeting:

1. Conduct a pre-construction meeting before Work begins. The Owner's Representative, Architect/Engineer, and responsible representatives from major subcontractors and other concerned parties shall be present. Participants shall be familiar with the Project and authorized to conclude matters relating to the Work.
2. Describe in detail when each portion of the Work is to be performed, based on the construction schedule. Discuss phasing and critical work sequencing. Subcontractors shall participate in discussion.
3. Discuss the following:
 - a. Subcontractors, including responsibilities and personnel assignments.
 - b. Key personnel, including contact information, and their duties.
 - c. Procedures for requests for interpretations, field decisions, and change orders.
 - d. Procedures for processing Applications for Payment.
 - e. Use of premises, including office and storage areas, parking availability, and Owner's requirements.
 - f. Work hours and restrictions.
 - g. Deliveries and priorities.
 - h. Temporary facilities and controls.
 - i. Housekeeping procedures, including progress cleaning and construction waste management and recycling.
 - j. Preparation of record documents.
4. Discuss questions that Contractor or subcontractors may have about Work or construction schedule.
5. The Architect/Engineer will interpret the Contract Documents.
6. The Owner's Representative will discuss partial occupancy and use of the facility during the construction and other Owner concerns.

C. Progress Meetings: Conduct progress meetings at regular intervals.

1. The Owner's Representative, Architect/Engineer, and representatives of each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be present. Participants shall be familiar with the Project and authorized to conclude matters relating to the Work.
2. Review and correct or approve the minutes of the previous progress meeting. Review items of significance that could affect the progress of the Work. Include topics for discussion as appropriate to the status of the Project.
3. Construction Schedule: Review the progress of the Work since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to the construction schedule. Determine how construction behind schedule will be expedited, and secure commitments from the parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - a. Review the schedule for the next period.
4. Review present and future needs of each entity present, including the following:
 - a. Sequence of operations, interface requirements, and coordination of the Work.
 - b. Status of submittals, deliveries, and off-site fabrication.
 - c. Field observations, problems, and decisions.

- d. Quality and work standards, and status of corrective measures for deficient items.
 - e. Status of payment requests, requests for interpretations, proposal requests, pending changes, Change Orders, and pending claims and disputes.
5. If Work is proceeding according to the construction schedule, the Architect/Engineer may cancel the next meeting.

1.5 SCHEDULES

- A. Prepare a construction schedule for the entire Work, including a complete sequence of construction by activity. The schedule shall be in the form of a horizontal bar chart, with a separate horizontal bar for each construction activity and the first workday of each week identified.
- 1. Provide beginning and completion dates for each construction activity and phase.
 - a. Indicate the completion percentage for each activity on the first day of each month.
 - b. Indicate time periods when portions of the Site will not be available for Owner use and when stairs and elevators will be used for construction activities.
 - c. Indicate periods of interruption of utility services.
 - 2. Provide submittal dates and dates when reviewed submittals will be required.
 - 3. Provide product procurement and delivery dates.
 - 4. Provide dates for the selection of finishes.
 - 5. Provide separate sub-schedules as necessary to provide more detail for critical portions of the schedule.
- B. Submit the construction schedule to the Owner's Representative and Architect/Engineer within one week after the date of the Notice to Proceed.
- C. Update the schedule on a monthly basis or when actual construction progress deviates significantly from that shown on the current schedule.
- 1. Show all changes that have occurred since the previous schedule was prepared, including the progress of each activity, current completion dates, and major changes in scope.
 - 2. Provide a narrative report that discusses the following items and their effects on the schedule.
 - a. Progress of each activity and current completion date, compared to the previous schedule.
 - b. Description of changes.
 - c. Problem areas, including current and anticipated delay factors.
 - d. Corrective actions taken or proposed.
 - 3. Resubmit to the Owner's Representative and Architect/Engineer.
- D. Distribute the current schedule to the job-site file, subcontractors, and other affected parties. Instruct parties to report any inability to comply and to provide a detailed explanation with suggested remedies.

1.6 PHOTOGRAPHIC DOCUMENTATION

- A. Photograph existing conditions that are important to the construction or that deviate substantially from the Contract Documents; significant conditions that will be concealed by the Work; finish surfaces that might be misconstrued as damage caused by removal or other Work operations; and immediate follow-up when on-site events result in construction damage or loss.
- 1. Photographs shall be in focus and shall clearly show the condition.

- B. Within two days of taking photographs, submit the complete digital-image electronic file with image log to the Architect/Engineer and Owner's Representative. Submit digital images exactly as originally recorded in the camera, without alteration, manipulation, editing, or modification.
1. Submit photographs of pre-existing damage prior to beginning Work in area.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for submitting shop drawings, product data, samples, and other submittals.

1.2 SUBMITTALS

- A. General:
1. Format:
 - a. PDF Submittals: Prepare submittals as a PDF package, incorporating complete information into one PDF file for each product or material. Name each PDF file with submittal number
 2. Submittal Identification: Include the following information in each submittal.
 - a. Project name.
 - b. Date.
 - c. Names of Architect/Engineer, Contractor, subcontractor, manufacturer, supplier, and firm or entity that prepared submittal, as appropriate.
 - d. Identification information, such as the number and title of the appropriate Specification section, Drawing number and detail references, location(s) where product is to be installed, or other necessary information.
 - e. Label each submittal with the six digit Specification section number followed by a decimal point and then sequential number (e.g., 042000.01). On resubmittals, include alphabetic suffix after another decimal point (e.g., 042000.01.A).
 - f. Provide space on or beside the label or title block for the Contractor's approval stamp and the action stamp of the Architect/Engineer.
 3. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not use reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements outlined in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions, including notation of those established by field measurement.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Notation of coordination requirements.
 - e. Relationship to adjoining construction clearly indicated.
- C. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. Clearly mark each copy of the submittal to show which products and options are applicable. Delete information which is not applicable. Supplement standard information with project-specific information.
 2. Include the following information, as applicable:

- a. Manufacturer's catalog cuts, product specifications, schematic drawings, installation instructions, and written recommendations.
 - b. Compliance with referenced standards.
 - c. Testing by recognized testing agency.
3. Submit the number of copies required by the Contractor plus two that will be retained by the Architect/Engineer, or digital file. Mark up and retain one returned copy as a Project Record Document.
- D. Samples: Upon request, submit physical samples to illustrate functional and aesthetic characteristics of the product, for review of materials and workmanship, for compatibility with other elements, and for comparison with the actual installed elements.
 1. Samples shall be of sufficient size to show the general visual effect.
 2. Include sets of at least three samples that show the full range of color, pattern, texture, graining, and finish.
 3. Transmit samples that contain multiple, related components, such as accessories, together in one submittal package.
 4. Identification: Attach a label on an unexposed side of each sample that includes the following:
 - a. Generic description of sample.
 - b. Product name, name of manufacturer, and sample source.
 - c. Number and title of appropriate Specification section.
 5. Samples for Initial Selection: Submit two full sets of units or sections of units from the supplier's product line, showing the full range of colors, textures, and patterns available. Architect/Engineer will retain one set and return one set with the options selected.
 6. Samples for Verification: Submit full-size units or samples of the size indicated, prepared from the same material to be used for the Work, cured and finished in the manner specified, and physically identical with material or product proposed for use, and that show the full range of color and texture variations expected.
 - a. Submit the number of samples required by the Contractor plus one that will be retained by the Architect/Engineer. Mark up and retain one returned sample as a Project Record Document.
 7. Maintain approved samples at the Site, available for quality-control comparisons during construction. Samples may be used to determine final acceptance of construction associated with the sample.

1.3 SUBMITTAL PROCEDURE

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
- B. Coordinate the preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, submittals requiring concurrent review, and related activities that require sequential activity.
 2. Allow sufficient time for submittal and resubmittal review. Failure to provide sufficient time for submittal and resubmittal reviews will not be a basis for extension of the Contract Time.
- C. Review Time:
 1. Allow seven days for the review of each submittal and resubmittal.

2. Allow additional time if coordination with subsequent submittals is required. The Architect/Engineer will advise the Contractor when the submittal being processed must be delayed for coordination.
 3. Time for review shall commence when the Architect/Engineer receives the submittal.
- D. Contractor Review:
1. Review each submittal, coordinate with other Work, and check for compliance with the Contract Documents. Verify field dimensions and conditions. Identify variations from the Contract Documents and product or system limitations that may be detrimental to the successful performance of completed Work. Note corrections.
 2. Before submitting to the Architect/Engineer, stamp or electronically mark-up, with a uniform approval stamp, including the reviewer's name; the date of Contractor's approval; and a statement certifying that the submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 3. Submittal Log: Maintain submittal log that lists submitted items per specification section. Record dates submitted, dates returned, and disposition of each item based on Architect/Engineer's review. Submit final log showing approved materials at Substantial Completion.
- E. Transmittal: Package each submittal individually and appropriately for transmittal and handling.
1. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
- F. Architect/Engineer Action:
1. Architect/Engineer will not review submittals that are received from sources other than the Contractor or that do not bear the Contractor's approval stamp, and will return them without action to the Contractor.
 2. Architect/Engineer will review each submittal for conformance with the design concept of the Project and compliance with the Contract Documents. Architect/Engineer will make marks to indicate corrections or modifications required, and stamp or electronically mark-up with an action stamp. The action stamp will include the reviewer's name, date of review, and required Contractor action. Contractor actions may include making corrections or modifications to the submittal or resubmitting the submittal, or both.
- G. Resubmittals: Make resubmittals in the same form and number of copies as the initial submittal.
1. Note the date and content of previous submittal.
 2. Note the date and content of the revision in the label or title block and clearly indicate the extent of the revision and changes made.
 3. Resubmit until the Architect/Engineer indicates that no resubmittal is required.
- H. Distribution: Furnish final copies (paper or digital) to the Site file, record documents file, manufacturers, subcontractors, suppliers, fabricators, installers, public authorities having jurisdiction, and others as necessary for performance of construction activities. Show the distribution on the transmittal forms.
- I. For construction, use only the final submittals with the Architect/Engineer's action stamp.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for temporary utilities, support facilities, and protection and controls.
- B. Pay for temporary utilities, support facilities, and protection and control measures unless otherwise indicated. Allow other entities to use temporary utilities and facilities without cost, including Owner's Representative, Architect/Engineer, subcontractors, testing agencies, and public authorities having jurisdiction.

1.2 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging and storage areas, and parking areas for construction personnel.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 GENERAL

- A. Conditions of Use:
 - 1. Locate temporary services and facilities where they will serve Project adequately and result in minimum interference with performance of Work. Coordinate locations with Owner's Representative.
 - 2. Provide temporary services and facilities ready for use when needed to avoid delay.
 - 3. Maintain temporary and existing services and facilities clean and neat, in good operating condition, and in condition acceptable to Owner's Representative.
 - 4. Relocate and modify temporary services and facilities as required by progress of Work.
 - 5. Enforce strict discipline in use of temporary services and facilities. To minimize waste and abuse, limit availability of temporary services and facilities to essential and intended uses.
 - 6. Remove temporary services and facilities when no longer needed, but no later than Substantial Completion.
 - a. Personnel remaining after Substantial Completion will be permitted to use permanent facilities under conditions acceptable to Owner's Representative.
 - b. Restore Site to condition existing before Project commencement.
 - c. Materials and facilities that constitute temporary facilities are property of Contractor.
- B. Provide temporary ladders, ramps, runways, stairs, scaffolding, staging, enclosures, hoists, rubbish chutes, and other construction aids as may be required for Work.

3.2 TEMPORARY UTILITIES

- A. Water Service: Use of Owner's existing water service will be permitted.
 - 1. Provide connections and extensions of service as required for construction operations.
 - 2. Provide additional water as necessary.
- B. Electric Power Service:
 - 1. Provide connections, extensions of service, and receptacle outlets as required for construction operations.
 - 2. As necessary, provide additional electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. Do not overload Owner's service.
- C. Lighting: Owner will provide existing lighting at existing locations.
 - 1. Provide additional lighting, as necessary, with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 2. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.3 TEMPORARY FACILITIES

- A. Parking: Construction personnel shall park in Work area or off-site unless other arrangements are made in advance in writing with Owner's Representative.
- B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel at location designated by Owner's Representative.
 - 1. Provide disposable supplies, including toilet tissue, paper towels, and paper cups. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 - 2. Service toilets at least twice weekly.
 - 3. Provide wash facilities supplied with potable water at convenient locations for personnel who handle materials that require clean up. Supply cleaning compounds appropriate for each type of material handled. Dispose of drainage properly.
 - a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
 - 4. Comply with public authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of public authorities having jurisdiction.
- D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Construction maintenance and operation shall be in accordance with public authorities having jurisdiction.
 - 2. Locate sufficient distance from exterior walls and protect walls to prevent damage.
- E. Temporary Rubbish Chutes:
 - 1. Construct dustproof rubbish chutes on outside of structure, as required.
 - 2. Maintain chutes, and remove when no longer needed or when directed by Owner's Representative.
 - 3. Discharge chutes into trucks or suitable containers to avoid rehandling of rubbish. Spray rubbish as required to prevent dust nuisance. Remove rubbish from Site.

3.4 TEMPORARY PROTECTION AND CONTROLS

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with applicable laws, governmental rules and regulations, and public authorities having jurisdiction with regard to noise, dust, pest, and pollution control.
- B. Barricades, Warning Signs and Lights, and Traffic Controls: Provide and maintain barricades, warning signs and lights, and traffic controls. Provide traffic control as necessary for construction vehicles entering and leaving Site, and for non-construction vehicles on or near Site. Comply with requirements of public authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- C. Project Identification and Temporary Signs: Provide Project identification and other signs at locations indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
 - 1. Provide temporary directional signs for construction personnel and visitors.
 - 2. Maintain signs so they are legible at all times.
- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Provide portable, UL-rated fire extinguishers with class and extinguishing agent as required by locations and classes of fire exposures.
 - 2. Prohibit smoking on Site.
 - 3. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of public authorities having jurisdiction.
 - 4. Store combustible materials in approved safety containers and enclosures, away from building if possible.
 - 5. Develop and supervise overall fire-prevention and -protection program for personnel at Site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
- E. Dust and Fume Control: Prevent dust, dirt, fumes, and odors from entering occupied areas.
 - 1. Provide and maintain floor-to-ceiling dustproof partitions to limit dust, dirt, fumes, and noise migration to occupied areas.
 - 2. Filter supply air or disconnect HVAC systems in or near Work area that service occupied areas.
- F. Noise Control: Perform Work in manner to minimize noise, during hours authorized by Owner's Representative.
- G. Existing Drains:
 - 1. Verify that drains in or near Work area are open and free flowing prior to start of Work.
 - 2. Lawfully remove construction effluent from Site. Do not allow construction debris to flow into existing drains or sewer systems.
 - 3. Rout or replace clogged drain lines at completion of Work.
- H. Temporary Construction Protection:

1. Provide and secure temporary weathertight protection for in-progress exterior construction, as needed, including unfinished Work on walls and roofs.
2. Protect finished surfaces against damage. Minimize traffic on finished roof surfaces and do not use for material storage.

END OF SECTION

SECTION 01 70 10

EXECUTION OF WORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: General administrative and procedural requirements governing execution of Work, including the following:
 - 1. Examination of existing conditions.
 - 2. Preparation.
 - 3. Removal of existing construction, including salvage and reuse of materials.
 - 4. Cutting and patching.
 - 5. Installation of Work.
 - 6. Protection of installed construction.
 - 7. Correction of Work.
 - 8. Progress cleaning.
- B. Cutting and patching includes the following:
 - 1. Removal and replacement of existing construction necessary to install Work or make several parts fit properly.
 - 2. Removal and replacement of Work
 - a. That is defective;
 - b. That does not conform to requirements of Contract Documents;
 - c. To provide for installation of ill-timed Work;
 - d. To alter Work; or
 - e. To allow observation of concealed Work.
 - 3. Removal of samples of installed Work for testing.

1.2 PAYMENT

- A. Pay for cutting and patching unless requested by Architect/Engineer for Work that is not defective or nonconforming.

1.3 REFERENCES

- A. Definitions:
 - 1. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
 - 2. Existing to remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
 - 3. Patching: Fitting and repair work required to restore construction to original condition after installation of other work.
 - 4. Remove: Detach items from existing construction and legally dispose of off-site, unless indicated to be removed and salvaged or removed and reinstalled.
 - 5. Remove and reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
 - 6. Remove and salvage: Detach items from existing construction and deliver to Owner ready for reuse.

1.4 SUBMITTALS

- A. Submit plan/procedures for protecting stored materials, installed work, building, and Site.
- B. Submit, prior to beginning Work, documentation of existing conditions, including finish surfaces, which might be misconstrued as damage caused by Work.

1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Architect/Engineer of locations and details of cutting and await directions from Architect/Engineer before proceeding. Shore, brace, and support structural element, as necessary, during cutting and patching. Do not cut and patch structural elements in manner that could change their load-carrying capacity or load-deflection ratio.
 - 2. Other Construction Elements: Do not cut and patch other construction elements or components in manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements might include the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Equipment supports.
 - 3. Visible Elements: Do not cut and patch exposed construction in a manner that results in visible evidence of cutting and patching or in a manner that would, in Architect/Engineer's opinion, reduce building's aesthetic qualities. Remove and replace construction that has been cut and patched in visually unsatisfactory manner.

1.6 PROJECT CONDITIONS

- A. Notify Architect/Engineer of discrepancies between Drawings and existing conditions before proceeding with Work.
- B. Assume responsibility for actual condition of existing construction.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during Contractor operations, by methods and with materials so as not to void existing warranties.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
 - 1. Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match adjacent surfaces to fullest extent possible.

- a. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide match acceptable to Architect/Engineer for visual and functional performance of in-place materials.
- B. Cleaning: Select cleaning materials, equipment, and methods to avoid scratching, marring, defacing, staining, or discoloring surfaces.
 1. Use cleaning materials and methods recommended by manufacturer of surface to be cleaned.
 2. Use cleaning materials on surfaces recommended by cleaning-material manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION OF EXISTING CONDITIONS

- A. Survey existing conditions and correlate with requirements indicated to determine extent of removal Work required.
 1. Inventory and record condition of items to be removed and salvaged or reinstalled.
- B. Document with photographs or video, or both, existing conditions of adjoining construction, including finish surfaces, which might be misconstrued as damage caused by demolition or other Work activities; existing conditions that are important to construction or that deviate substantially from Contract Documents; and significant conditions that will be concealed by Work.
- C. Examination and Acceptance of Conditions: Before proceeding with each component of Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Provide a written description of conditions detrimental to performance of the Work, including substrates and unacceptable installation tolerances, and recommend corrections.
 4. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.
- D. When unanticipated structural, electrical, or mechanical elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit written report to Architect/Engineer.
- E. Survey existing conditions as Work progresses to detect hazards resulting from construction.
- F. Provide access to Work areas and perform localized demolition as necessary for inspection of concealed underlying conditions by Architect/Engineer and Owner's Representative.

3.2 UTILITIES AND MECHANICAL AND ELECTRICAL SYSTEMS

- A. Disconnect and seal or cap off indicated utility services and mechanical and electrical systems in Work areas.

- B. Where existing utility services or mechanical or electrical systems are required to be removed, relocated, or abandoned, bypass such services/systems before beginning Work to prevent interruption to occupied areas.

3.3 PREPARATION

- A. Field Measurements: Take field measurements as required to fit Work properly. Recheck measurements before installing each product. Where portions of Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of Contract Documents caused by differing field conditions outside of the control of the Contractor, submit a request for information to Architect/Engineer. Include a detailed description of the problem encountered, with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.4 PARTIAL REMOVAL

- A. Demolish and remove existing construction and installations only as necessary and required for proper installation of Work indicated on the Drawings and Specifications.
 - 1. Conduct removals carefully to avoid damaging existing construction and installations that will remain. Protect construction that will remain against damage and soiling. When permitted by Architect/Engineer, items may be removed to a suitable, protected storage location during removal Work and cleaned and reinstalled in original locations after removal operations are complete.
 - a. Neatly cut openings and holes plumb, square, and true to dimensions required.
 - b. Cut or drill from exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - c. Use cutting methods least likely to damage construction to remain.
 - d. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
 - e. Temporarily cover openings to remain.
 - 2. Provide and maintain shoring, bracing, and structural supports, as required to preserve stability and prevent movement, settlement, or collapse of construction or finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 3. Remedy damage to existing construction and installations caused by Contractor operations.

3.5 CUTTING AND PATCHING

- A. General: Cut in-place construction to provide for installation of other components or performance of other construction and proceed with patching after construction operations requiring cutting are complete, as required to restore surfaces to their original condition.
 - 1. Employ skilled workers to perform cutting and patching.
 - 2. Proceed with cutting and patching at earliest feasible time and complete without delay.
 - 3. Provide temporary support of work to be cut.
 - 4. Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

5. Coordinate cutting and patching with use of and free passage to adjoining occupied areas.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using cutting machine, such as abrasive saw or diamond-core drill.
 4. Provide substrate suitable for installation of Work and patching.
 5. Notify Architect/Engineer and Owner's Representative immediately of damage to concealed elements, such as electrical conduits.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections.
 1. Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in manner that will minimize evidence of patching and refinishing. Provide even surface of uniform finish, color, texture, and appearance.
 3. Where patching occurs in painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over patch, and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Patch exterior building enclosure components in manner that restores enclosure to weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 INSTALLATION OF WORK

- A. General: Locate Work and components of Work accurately, in correct alignment and elevation. Make vertical work plumb and make horizontal work level.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

- F. Templates: Obtain and distribute to parties involved templates for work specified to be factory prepared and field installed. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where the size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Allow for building movement, including thermal expansion and contraction.
 - 2. Coordinate the installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous. Provide adequate ventilation during use of volatile or noxious materials.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at the time of Substantial Completion.
- B. Comply with the manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their condition prior to construction.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

3.9 PROGRESS CLEANING

- A. General: Clean Site and Work areas daily, including common areas. Enforce requirements strictly. Separate materials per disposal requirements and dispose of legally.
 - 1. Provide containers for waste materials, debris, and rubbish.
 - 2. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

3. Collect hazardous and unsanitary waste materials and debris in separate containers from other waste. Use containers intended for holding waste materials of type to be stored and mark containers appropriately. Remove from Site daily and dispose of legally.
 4. Do not bury or burn waste materials, debris, or rubbish on-site. Do not discharge or wash waste materials, debris, or rubbish down sewers or into waterways.
- B. Site: Maintain Site and surrounding areas free of waste materials, debris, and rubbish from construction operations and personnel.
- C. Work Areas: Clean areas where Work is in progress to level of cleanliness necessary for proper execution of Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of Work, broom-clean or vacuum entire work area or dampen area, as appropriate.
- D. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at the time of Substantial Completion.
- G. Handle waste materials, debris, and rubbish in a controlled manner with as few handlings as possible. Do not throw from heights.

END OF SECTION

SECTION 01 70 20

PROJECT CLOSEOUT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for contract closeout, including final cleaning; Substantial Completion and final completion procedures; and project record documents.
- B. Related Sections:
 - 1. Divisions 02 through 08 sections for special cleaning and specific closeout requirements for Work in those sections.

1.2 SUBMITTALS

- A. Warranties:
 - 1. Organize warranty documents into orderly sequence based on table of contents of Project Manual.
 - a. Bind warranties in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - b. Scan warranties and assemble the complete warranty submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide a table of contents at the beginning of the document.
 - 2. Submit one set of binders and one scanned copy of warranty package.
 - 3. Provide additional copies of each warranty to include in maintenance manual.
- B. Product Maintenance Manual:
 - 1. Assemble complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated in the Work. Include maintenance data required in individual Specification sections, for each product and system and the following:
 - a. Manufacturer's address and product information, cross-referenced to Specification section number and title.
 - 1) Include project-specific product details, such as color, pattern, texture, and material and chemical composition.
 - 2) Include re-ordering information for specially manufactured products.
 - 3) For manufacturers' standard printed data, include only sheets pertinent to product installed. Mark each sheet to identify each product incorporated into the Work. If data include more than one item, identify each item using appropriate references from Specification sections. Identify data applicable to the Work and delete references to information not applicable.
 - b. Name, address, and telephone number of Installer or supplier.
 - c. Maintenance and service schedules for preventive and routine maintenance.
 - d. Maintenance procedures, and maintenance materials and sources.
 - e. Maintenance record forms.
 - f. Copies of maintenance service agreements and warranties.
 - 2. Organize into suitable sets of manageable size, with a separate section for each product, material, and finish.

- a. Bind and index data in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, sized to receive 8-1/2-by-11-inch paper and in thickness necessary to accommodate contents, with pockets inside covers to receive folded oversized sheets..
 - b. Provide heavy, paper dividers with plastic-covered tabs for each separate product. Mark tab to identify product or installation.
 - c. Identify each binder on front and spine with typed or printed title "PRODUCT MAINTENANCE MANUAL," Project name, and subject matter of contents.
 - d. Scan the maintenance manual and assemble the complete maintenance submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide a table of contents at the beginning of the document.
3. Submit one set of binders and one scanned copy of maintenance manual package.

PART 2 PRODUCTS

2.1 MATERIALS

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

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations. Return adjacent surfaces and areas to condition existing before Work began.
 1. Remove tools, construction equipment, machinery, and surplus material from Site.
 2. Clean Site, yard, and grounds, including landscaped areas, of rubbish, waste materials, litter, and other foreign substances.
 - a. Broom clean paved areas. Remove petrochemical spills, stains, and other foreign deposits.
 - b. Rake grounds that are neither planted nor paved to smooth, even-textured surface.
 3. Clean exposed exterior and interior hard-surfaced finishes to dirt-free condition, free of stains, films, and similar foreign substances. Polish surfaces to achieve specified finish. Avoid disturbing natural weathering of exterior surfaces.
 - a. Touchup and otherwise repair and restore marred exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that show evidence of repair or restoration.
 - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
 4. Clean and restore transparent and reflective surfaces, such as mirrors and glass in doors and windows, to their original condition. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 5. Remove labels that are not permanent.
 6. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

7. Sweep floors broom clean. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
8. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove paint and mortar droppings and other foreign substances.
9. Leave Project clean and ready for occupancy.

3.2 SUBSTANTIAL COMPLETION

- A. Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
 1. Prepare punch list, value of items on list, and reasons why Work is not complete.
 2. Deliver tools, spare parts, extra materials, and similar items to location designated by the Owner's Representative. Label with manufacturer's name and model number where applicable.
 3. Terminate and remove temporary facilities from Site, along with mockups, construction tools, and similar elements.
 4. Complete final cleaning requirements, including touchup painting.
 5. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

3.3 FINAL COMPLETION

- A. Before requesting final inspection for determining final completion, complete the following:
 1. Submit copy of Architect/Engineer's Substantial Completion inspection punch list, endorsed and dated by Architect/Engineer, with statement that items on punch list have been completed or otherwise acceptably resolved.
 2. Instruct Owner's personnel in maintenance of products installed.
- B. Request final inspection. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements.
 1. Request re-inspection when Work identified in previous inspections as incomplete is completed or corrected.

3.4 PROJECT RECORD DOCUMENTS

- A. During Work, maintain one set of prints of Drawings and reviewed shop drawings, Specifications, and product data for recording deviations of as-built construction from design information. Include addenda and Contract modifications.
 1. Accurately document and record changes and modifications as soon as possible after they occur, in understandable manner.
 2. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Record and check markup before enclosing concealed installations.
 3. Include:
 - a. Dimensional changes.
 - b. Revisions to Drawing details and details not on Drawings.
 - c. Changes made by Change Order or Architect/Engineer's written orders. Note Change Order numbers or similar identification.
 - d. Field records for variable and concealed conditions.
 - e. Record information on Work that is shown only schematically or omitted from Drawings.

- f. Actual products and materials used.
 - 1) Include product data, specifically marked for Project, and cross-referenced to Specifications, Drawings, and Change Orders.
 - 2) Include names of manufacturer and Installer, and other information necessary to provide record of selections made.
 - 3) Include significant changes in product delivered to Site and changes in manufacturer's written instructions for installation.
 - 4. Mark record document most capable of showing actual physical conditions completely and accurately. Cross-reference on other record documents.
 - 5. Mark record documents with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of Work at the same location.
- B. Store Record Documents and samples in field office apart from Contract Documents used for construction. Do not use Record Documents for construction purposes. Maintain Record Documents in good order and in clean, dry, legible condition, protected from deterioration and loss. Provide access to Record Documents for Architect/Engineer's reference during normal working hours.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Supply and construction of wood framing and miscellaneous wood construction.

1.2 REFERENCES

- A. Abbreviations:
1. ALSC: American Lumber Standard Committee.
 2. APA: APA - The Engineered Wood Association.
 3. OSB: Oriented-strand board.
- B. Definitions:
1. Rough carpentry: Carpentry Work that is not exposed; that is, concealed by other construction.
- C. Reference Standards: Latest edition as of Specification date.
1. American Lumber Standard Committee (ALSC):
 - a. PS 20: Voluntary Product Standard, American Softwood Lumber Standard.
 2. American National Standards Institute (ANSI)/American Wood Council (AWC):
 - a. National Design Specification for Wood Construction (ANSI/AWC NDS).
 3. American National Standards Institute (ANSI)/ASME - The American Society of Mechanical Engineers (ASME):
 - a. ANSI/ASME B18.6.1: Wood Screws (Inch Series).
 4. American Wood Council (AWC):
 - a. WCD 1 - Details for Conventional Wood Frame Construction.
 5. American Wood Protection Association (AWPA):
 - a. M4: Standard for the Care of Preservative-treated Wood Products.
 - b. T1: User Category System: Processing and Treatment Standard.
 - c. U1: Use Category System: User Specification for Treated Wood.
 6. APA-The Engineered Wood Association (APA):
 - a. Engineered Wood Construction Guide (Construction Guide).
 - b. PRP-108: Performance Standards and Qualification Policy for Structural-Use Panels.
 7. ASTM International:
 - a. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
 - b. A666: Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - c. D3498: Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems.
 - d. F1667: Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

1.3 SUBMITTALS

- A. Product Data:
 - 1. Dimension Lumber: Species, grading, and intended use of lumber proposed for use on Project; by grading agency accredited by ALSC Board of Review. Clearly note requested substitutions that differ from those specified.
 - 2. Treated Wood:
 - a. Chemical treatment manufacturers' literature, including:
 - 1) Compliance with requirements.
 - 2) Written instructions for handling, storing, installing, and finishing treated wood.
 - 3) Written requirements for corrosion protection of fasteners and connectors to be in contact with treated wood.
 - 4) Copies of warranties for each type of treatment.
 - b. Certification by treating plant that treated wood complies with requirements.
 - 1) Indicate type of preservative used and net amount of preservative retained.
 - 2) For treatments requiring drying after treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Site.
 - c. Include Safety Data Sheets (SDS) for information only; safety restrictions are sole responsibility of Contractor.
 - 3. Fabricated Products: manufacturer's literature indicating conformance with requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials to prevent damage to materials or structure.
- B. Deliver materials to Site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, lot number, and directions for storing and mixing with other components.
- C. 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 damage.
- D. Store materials in original, undamaged containers in clean, dry, protected location on raised platforms with weather-protective coverings, within temperature range required by manufacturer.
- E. Stack lumber, plywood, and other panels. Protect from water and weather. Place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.
- F. Limit stored materials on structures to safe loading capacity of structure at time materials are stored, and to avoid permanent deck deflection.
- G. Conspicuously mark damaged materials and damaged or opened containers or containers with contaminated materials, and remove from Site as soon as possible.

1.5 PROJECT CONDITIONS

- A. Verify existing dimensions and details prior to start of rough carpentry 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. Handle and install materials in strict accordance with safety requirements required by 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.

1.6 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.

PART 2 PRODUCTS

2.1 DIMENSION LUMBER

- A. General: ALSC PS 20; provide lumber of nominal sizes shown on Drawings.
 - 1. Grade: Per applicable rules of lumber grading agency accredited by ALSC Board of Review. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2 inch nominal thickness or less, unless otherwise indicated.
- B. Wood Nailers: Southern pine, No. 1 grade or better.

2.2 PLYWOOD AND ORIENTED-STRAND BOARD PANELS

- A. General: APA PRP-108; provide panels of nominal thicknesses shown on Drawings.
 - 1. Identification: Per APA performance standards. Factory mark each panel with performance ratings.
- B. Roof Sheathing: APA Rated Sheathing, Exposure 1; plywood.

2.3 AUXILIARY MATERIALS

- A. Miscellaneous Lumber: Provide lumber for support or attachment of other construction, including rooftop equipment bases and support curbs, blocking, cants, nailers, and furring.
 - 1. Construction grade or better, with 19 percent maximum moisture content.
- B. Fasteners: ANSI/AWC NDS.

2.4 OTHER MATERIALS

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions with framing Subcontractor for compliance with requirements and other conditions affecting installation or performance of rough carpentry Work.
 - 1. Ensure that work done by other trades is complete and ready for rough carpentry Work.
 - 2. Verify that areas and conditions under which rough carpentry 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 rough carpentry Work and recommend corrections.
 - 4. Do not proceed with rough carpentry Work until adverse conditions have been corrected and reviewed by Architect/Engineer.
 - 5. Commencing rough carpentry 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, coatings, 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, GENERAL

- A. Install wood construction according to Drawings and Specifications, and minimum requirements of local building code. Notify Architect/Engineer of deviations between Drawings and Specifications and minimum code requirements.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
 - 1. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit.
 - 2. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

- C. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
 - 1. Do not splice structural members between supports unless indicated otherwise on Drawings.
- D. Securely connect rough carpentry and attach to substrate as indicated on Drawings.
 - 1. Make tight connections between members.
 - 2. Space and install fasteners without splitting wood.
 - 3. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.
 - 4. For hardware, anchors, and connectors, use fasteners in all holes per manufacturer's recommendations unless indicated otherwise.
 - 5. Lag screws: Pre-drill holes to diameter at base of threads and length equal to embedment.
 - 6. Bolts: Drill holes 1/16-inch larger in diameter than bolts used. Drill straight and true from one side only. Use washers under head and nut.

3.4 WOOD SLEEPER, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated on Drawings and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading.
 - 1. Recess bolts and nuts flush with surfaces unless otherwise indicated.
 - 2. Build anchor bolts into masonry during installation of masonry work.
 - 3. Where possible, secure anchor bolts to formwork before concrete placement.

3.5 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with recommendations of APA Construction Guide.
 - 1. Install roof panels with long edge perpendicular to joists.

3.6 FIELD QUALITY CONTROL

- A. Architect/Engineer may observe in-progress construction for quality and conformance with Construction Documents. Notify Architect/Engineer of Work progress at least weekly.

3.7 CLEANING

- A. At the end of each workday, clean Site and Work areas and place debris and rubbish in appropriate containers.
- B. After completing rough carpentry Work, clean up debris and surplus materials and remove from Site.

3.8 PROTECTION

- A. Protect installed rough carpentry from damage due to exposure to harmful weather, physical abuse, and other causes. Temporary cover rough carpentry Work exposed to weather as soon as practical after installation to prevent deterioration from wetting.

END OF SECTION

SECTION 07 41 13
BATTEN SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes batten-seam metal roof panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- 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.
- C. Samples: For each type of metal panel indicated.

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

- A. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
 1. Uplift Rating: UL 90.
- B. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
 1. Fire/Windstorm Classification: Class 1A-90
 2. Hail Resistance: SH.
- C. 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.

2.2 BATTEN-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panel assembly designed to be installed by covering vertical side edges of adjacent panels with battens and mechanically attaching panels to supports using concealed clips. Include battens and accessories required for weathertight installation.
- B. Wide-Profile, Snap-on-Batten-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and a flat pan between ribs; designed for independent installation by mechanically attaching panels to supports using concealed clips located between panels, engaging the opposite edge of adjacent panels, and installing snap-on battens over panel joints.
 1. Manufacturer:
 - a. Berridge Manufacturing Company
 - b. PAC-CLAD; Petersen Aluminum Corporation
 - c. Or approved equal.
 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 coating designation, or aluminum-zinc alloy-coated steel

sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

- a. Nominal Thickness: 24 gauge.
 - b. Exterior Finish: Three-coat fluoropolymer
 - c. Color: As selected by Owner from manufacturer's full range.
3. Batten Material: Same material, finish, and color as roof panels.
 4. Clips: Manufacturer's one-piece fixed to accommodate thermal movement.
 5. Retain one of two "Material" subparagraphs below. Retain steel clips for metallic-coated steel roof panels and stainless-steel clips for aluminum panels.
 6. Panel Coverage: 16 inches.
 7. Batten Height: 1-1/2 inches.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
 3. Grace Ultra or approved equivalent.
- B. Felt Underlayment: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felts.
- C. Slip Sheet: Red rosin sized paper.

2.4 ROOF INSULATION

- A. Polyisocyanurate/ plywood composite nailbase boards: ASTM C1289, Type V, 20-pounds-per-square-inch minimum compressive strength.
 1. Total thickness: One layer, 3.0 inches thick with 3/4" plywood.
 2. Nail base manufacturer's recommended fasteners for securement to roof deck.

2.5 MISCELLANEOUS MATERIALS

- A. 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, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, Z-closures, 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 ridges, 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.
- C. 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, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Gutters and Downspouts: Formed from same material as roof panels according to SMACNA's "Architectural Sheet Metal Manual." Finish to match metal roof panels.
- E. 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.
- F. 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.

2.6 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.

2.7 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 INSULATION INSTALLATION

- A. Mechanically fasten nailbase board over existing insulation using nail base manufacturer's proprietary fasteners designed for the boards in accord with approved shop drawing submittal.
 - 1. Minimum 30 fasteners per board.

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.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
 - 1. Apply over the roof area indicated below:
 - a. Roof perimeter for a distance up from eaves of **36 inches beyond interior wall line.**
 - b. Valleys, from lowest point to highest point, for a distance on each side of 36 inches. Overlap ends of sheets not less than 6 inches.
 - c. Rake edges for a distance of 18 inches.
 - d. Hips and ridges for a distance on each side of 18 inches.
 - e. Around dormers, chimneys, skylights, and other penetrating elements for a distance from element of 18 inches.
- B. Felt Underlayment: Apply at locations indicated below, in shingle fashion to shed water, and with lapped joints of not less than 2 inches.
 - 1. Apply on roof not covered by self-adhering sheet underlayment. Lap over edges of self-adhering sheet underlayment not less than 3 inches, in shingle fashion to shed water.

- C. Slip Sheet: Apply slip sheet over underlayment before installing metal roof panels.
- D. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.4 METAL PANEL INSTALLATION

- A. Batten-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each batten-seam joint at location, spacing, and with fasteners recommended by manufacturer.
 - 1. Install clips to supports with self-drilling fasteners.
 - 2. Apply battens to metal roof panel seams, fully engaged to provide weathertight joints.
 - 3. Watertight Installation:
 - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend by manufacturer as needed to make panels watertight.
 - b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.
 - d. Use single length panels when practical.
- B. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- C. 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. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

3.5 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 074113.19

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. 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.
- B. 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.
- C. 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.
- D. 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.
- E. 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. 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.
- B. 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.

- C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- D. 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 19

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:

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 site, 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 standard 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. 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: Manufacturer'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.
- 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, 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 standard.
- 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 [roof edge flashing;] [copings;] [base counterflashings;] [roof-penetration flashing;] [roof-drain flashings;] [aprons, steps, crickets, and backer flashings;] [valley flashings;] [drip edges;] [eave, rake, ridge, and hip flashings;] [hanging gutters;] [built-in gutters;] [downspouts;] [parapet scuppers;] [conductor heads;] [flashings at wall openings;] and [manufactured reglets]:

B.

- C. For copings; drip edge; gravel stops; hanging gutters; downspouts;
 - 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 07 72 53

SNOW GUARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Rail-type, seam-mounted snow guards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Include roof plans showing layouts and attachment details of snow guards.
 - 1. Include details of rail-type snow guards.
- C. Samples:
 - 1. Rail-Type Snow Guards: Bracket and 12-inch long rail.
 - a. For units with factory-applied finishes, submit manufacturer's standard color selections.
- D. Delegated-Design Submittal: For snow guards, include analysis reports signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Include calculation of number and location of snow guards.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer's experience with providing delegated design engineering services of the kind indicated, including documentation that the engineer is licensed in the state in which the Project is located.
- B. Product Test Reports: For each type of snow guard, for tests performed by a qualified testing agency, indicating point of failure of attachment to roof system identical as that used on this Project.

1.5 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit adhesive-mounted snow guards to be installed according to adhesive manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 RAIL-TYPE SNOW GUARDS

- A. Flat-Mounted, Rail-Type Snow Guards (Base Bid):
 - 1. Basis of design: PP145 Snow guard by Alpine Snow Guards, Hi-Pipe, 2-pipe bracket
 - 2. Description: Units fabricated from metal baseplate anchored to fixed bracket over EPDM gasket and equipped with two bars, rails, or pipes.
 - 3. Bracket fasteners: Factory-coated steel screws complying with corrosion resistance provisions of FM 4470, designed for fastening to substrate indicated, and acceptable to roofing manufacturer. Fasteners for snow guard brackets shall be #15 Heavy Duty.
 - 4. Brackets and Baseplate: Aluminum; Powder coated to match roof panel color.
 - 5. Bars: Aluminum; Powder coated to match roof panel color.
 - a. Profile: Round.
 - 6. Ice Flags: Powder coated to match roof panel color.
- B. Fence-Type Snow Guards (Alternate 1)
 - 1. Basis of design: SafeGuard Membrane Fence-Style Snow Guard by Alpine Snow Guards.
 - 2. Description: Unit consists of an aluminum bracket, stainless steel base plate, and aluminum clip, and an aluminum bar that will accept a color insert strip.
 - a. Color of insert strip to match roof color.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, snow guard attachment, and other conditions affecting performance of the Work.
 - 1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare substrates for bonding snow guards.
- B. Prime substrates according to snow guard manufacturer's written instructions.

3.3 INSTALLATION

- A. Install snow guards according to manufacturer's written instructions.
 - 1. Space rows as recommended by manufacturer.
- B. Attachment for Metal Roofing:
 - 1. Do not use fasteners that will void metal roofing finish warranty.
 - 2. Flat-Mounted, Pad-Type Snow Guards (Base Bid):
 - a. Adhere EPDM gasket to metal roof panel as recommended by manufacturer.
 - b. Mechanically fasten to metal roof deck, using snow guard manufacturer's recommended gasketed fasteners.
 - c. Install new snow guard brackets only through tops of ribs in roof decking.
 - d. Seal tops of bolt heads with silicone sealant. Install cove bead of silicone sealant around edge of bracket plate.
 - e. Install new railing system per manufacturer's instructions. Include internal couplings, end caps, and end collars. Install ice flags between each rib in the roof panels
 - 3. Fence-Type Snow Guards (Alternate 1)
 - a. Fasten base plate into structure using 8 fasteners per plate.
 - b. Install flashing piece over plate and attach bracket assembly.
 - c. Install aluminum clip and aluminum bar following manufacturer recommendations.
 - d. Insert color strip in groove and secure following manufacturer recommendations.

END OF SECTION 07 72 53

SECTION 08 45 23

TRANSLUCENT WALL AND ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the insulated translucent sandwich panel skylight 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. When requested, 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: 5" long sections
- D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.
- E. 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 panel system.
1. When requested, include structural analysis data signed and sealed by the qualified professional engineer 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 leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering, defects in accessories, insulated translucent sandwich panels and other components of the work.

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.

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" shoji
- 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.

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.
- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

3.4 FIELD QUALITY CONTROL

- A. Water Test: Installer to test skylights according to procedures in AAMA 501.2.
- B. Repair or replace work that does not pass testing or that is damaged by testing and retest work.

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