

FORT MONROE  
COMMUNITY CENTER  
ROOF REPLACEMENT

Project number is 360-A9360-001

CITY OF HAMPTON



PROJECT MANUAL

HUDSON + ASSOCIATES  
ARCHITECTS

September 23, 2019





**FORT MONROE COMMUNITY CENTER**  
**ROOF REPLACEMENT**  
**Project Number: 360-A9360-001**

Division	Section Title
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**SPECIFICATIONS GROUP**

*Procurement Requirements Subgroup*

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**ROOF REPLACEMENT**  
**Project Number: 360-A9360-001**

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076200 SHEET METAL FLASHING AND TRIM  
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# GENERAL CONTRACTOR ESTIMATE FOR CHANGE ORDER

GC-1

DGS-30-200  
(Rev. 03/16)

Project Code: \_\_\_\_\_  
Agency: \_\_\_\_\_  
Project: \_\_\_\_\_

General Contractor: \_\_\_\_\_  
Change Description: \_\_\_\_\_

Scope Description		Direct Labor				Direct Material			Direct Equipment				
		Direct Labor Hours	Labor Units (Manhours, Crew Hours)	Hourly Wage Rate, Excl. Taxes & Ins.	Total Labor Cost	Quantity	Qty Units	Material Cost Per Unit	Total Material Cost	Quantity	Qty Units	Equipment Cost Per Unit	Total Equipment Cost
A	B	C	D	E	F=C x E	G	H	I	J=G x I	K	L	M	N=K x M
1.01					\$0.00	1.00		\$100.00	\$100.00				\$0.00
1.02					\$0.00				\$0.00				\$0.00
1.03					\$0.00				\$0.00				\$0.00
1.04					\$0.00				\$0.00				\$0.00
1.05					\$0.00				\$0.00				\$0.00
1.06					\$0.00				\$0.00				\$0.00
1.07					\$0.00				\$0.00				\$0.00
1.08					\$0.00				\$0.00				\$0.00
1.09					\$0.00				\$0.00				\$0.00
1.97	Subtotal from Estimate Continuation Sheets				\$0.00				\$100.00				\$0.00
1.98	Subtotal (S/T) Direct Costs:				\$0.00				\$100.00				\$0.00
1.99	Taxes/Insurance: FICA, FUI, SUI, & Workmens' Comp.				\$0.00			0.0%					\$0.00
1.99	Total Direct Costs				\$0.00				\$100.00				\$0.00

Item No.	Subcontractor Name	Total Cost
A	B	C
2.01		
2.02		
2.03		
2.04		
2.05		
2.06		
2.07		
2.08		
2.09		
2.99	Total Subcontract Costs	\$0.00

Item No.	Description	Total Cost
3.01	Total Direct Labor Cost	\$0.00
3.02	Total Direct Material Cost	\$100.00
3.03	Total Equipment Cost	\$0.00
3.04	Subtotal	\$100.00
3.05	Overhead and Profit* (%)	\$0.00
3.06	Subtotal	\$100.00
3.07	Subcontractor Cost	\$0.00
3.08	GC Markup on Subcontractors** (%)	\$0.00
3.09	Subtotal	\$100.00
3.10	Additional Bond Cost	
3.99	Total Change Order Cost	\$100.00

## SUMMARY

Name: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

I have reviewed the costs proposed and find them to be reasonable (as proposed) (as marked).

A/E Signature: \_\_\_\_\_

Note: Mark-up is capped in conformance with the provisions of the General Conditions (CO-7).

\*Limited to 15% on self-performed work.

\*\*Limited to a total of 10%, shared (cumulative total) if multiple tier subs, on subcontracted work. See Mark-up limitations for a more detailed description.

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**SUBCONTRACTOR ESTIMATE FOR CHANGE ORDER**

SC-1

Project Code: \_\_\_\_\_ General Contractor: \_\_\_\_\_  
 Agency: \_\_\_\_\_ Subcontractor: \_\_\_\_\_  
 Project: \_\_\_\_\_ Subcontractor Trade: \_\_\_\_\_

Change Description: \_\_\_\_\_

SUBCONTRACTOR DIRECT COSTS													
Scope Description		Direct Labor			Direct Material			Direct Equipment					
Item No.	Description	Direct Labor Hours	Labor Units (Manhours, Crew Hours)	Hourly Wage Rate, Excl. Taxes & Ins.	Total Labor Cost	Quantity	Qty Units	Material Cost Per Unit	Total Material Cost	Quantity	Qty Units	Equipment Cost Per Unit	Total Equipment Cost
A	B	C	D	E	F=C x E	G	H	I	J=G x I	K	L	M	N=K x M
1.01					\$0.00				\$0.00				\$0.00
1.02					\$0.00				\$0.00				\$0.00
1.03					\$0.00				\$0.00				\$0.00
1.04					\$0.00				\$0.00				\$0.00
1.05					\$0.00				\$0.00				\$0.00
1.06					\$0.00				\$0.00				\$0.00
1.07					\$0.00				\$0.00				\$0.00
1.08					\$0.00				\$0.00				\$0.00
1.09	Subtotal from Estimate Continuation Sheets				\$0.00				\$0.00				\$0.00
1.97	Subtotal (S/T) Direct Costs:				\$0.00				\$0.00				\$0.00
1.98	Taxes/Insurance:				\$0.00				\$0.00				\$0.00
1.99	Total Direct Costs				\$0.00				\$0.00				\$0.00
					Subtotal Labor	Subtotal Material		Subtotal Equipment					
					% of Labor	Sales Tax		Sales Tax					
					Total Labor	Total Material		Total Equipment					

SUB-SUBCONTRACT COSTS		
Item No.	Sub-Subcontractor Name	Total Cost
A	B	C
2.01	(List totals from attached SS-1 forms)	
2.02		
2.03		
2.04		
2.05		
2.06		
2.99	Total Sub-Subcontract Costs	\$0.00

SUMMARY		
Item No.	Description	Total Cost
3.01	Total Direct Labor Cost	\$0.00
3.02	Total Direct Material Cost	\$0.00
3.03	Total Equipment Cost	\$0.00
3.04	Subtotal	\$0.00
3.05	Overhead and Profit* (%)	\$0.00
3.06	Total Subcontractor Cost	\$0.00
3.07	Sub-Subcontractor Cost**	\$0.00
3.99	S/C Cost to GC-1 Form***	\$0.00

**Submitted By**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**Note:** Mark-up is capped in conformance with the provisions of the General Conditions (CO-7).

\*Limited to 15% on self-performed work.

\*\*Limited to a total of 10%, shared (cumulative total) if multiple tier subs, on subcontracted work. Total mark-up on subcontracted work is calculated on the GC-1 form. See mark-up limitations for a more detailed description.

\*\*\* The subcontractor cost carried forward to GC-1 form does not include mark-up on sub-subcontractor costs. This mark-up is calculated on the GC-1 form. The GC and its subcontractors shall establish how the mark-up is to be distributed among the various subcontractors involved in the work.

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## SUB-SUBCONTRACTOR ESTIMATE FOR CHANGE ORDER

SS-1

**Project Code:** \_\_\_\_\_  
**Agency:** \_\_\_\_\_  
**Project:** \_\_\_\_\_  
  
**General Contractor:** \_\_\_\_\_  
**Subcontractor:** \_\_\_\_\_  
**Sub-Subcontractor:** \_\_\_\_\_  
**Sub-Subcontractor Trade:** \_\_\_\_\_

**Change Description:** \_\_\_\_\_

SUB-SUBCONTRACTOR DIRECT COSTS													
Scope Description			Direct Labor				Direct Material			Direct Equipment			
Item No.	Description	Direct Labor Hours	Labor Units (Manhours, Crew Hours)	Hourly Wage Rate, Excl. Taxes & Ins.	Total Labor Cost	Quantity	Qty Units	Material Cost Per Unit	Total Material Cost	Quantity	Qty Units	Equipment Cost Per Unit	Total Equipment Cost
A	B	C	D	E	F=C x E	G	H	I	J = G x I	K	L	M	N = K x M
1.01					\$0.00				\$0.00				\$0.00
1.02					\$0.00				\$0.00				\$0.00
1.03					\$0.00				\$0.00				\$0.00
1.04					\$0.00				\$0.00				\$0.00
1.05					\$0.00				\$0.00				\$0.00
1.06					\$0.00				\$0.00				\$0.00
1.07					\$0.00				\$0.00				\$0.00
1.08					\$0.00				\$0.00				\$0.00
1.09	<b>Subtotal from Estimate Continuation Sheets</b>												
1.97	<b>Subtotal (S/T) Direct Costs:</b>								<b>\$0.00</b>				<b>\$0.00</b>
1.98	<b>Taxes/Insurance:</b>												
1.99	<b>Total Direct Costs</b>								<b>\$0.00</b>				<b>\$0.00</b>

SUMMARY		
Item No.	Description	Total Cost
3.01	Total Direct Labor Cost	Item 1.99H \$0.00
3.02	Total Direct Material Cost	Item 1.99J \$0.00
3.03	Total Equipment Cost	Item 1.99L \$0.00
3.04	Subtotal	3.01+3.02+3.03 \$0.00
3.05	Overhead and Profit* (%)	\$0.00
3.99	<b>Total Sub-Subcontractor</b>	<b>\$0.00</b>

**Submitted By**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

*Note: Mark-up is capped in conformance with the provisions of the General Conditions (CO-7).  
\*Limited to 15% on self-performed work. See Mark-up limitations for a more detailed description.*

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<b>DGS-30-104 ( FORM CO-12 )</b> (Rev. 01/16)	<b>SCHEDULE OF VALUES</b> and <b>CERTIFICATE FOR PAYMENT</b>	<b>PAYMENT REQUEST NO.</b> <b>1</b>	
<b>PART A</b> <b>SUMMARY AND CERTIFICATION</b>		<b>PERIOD BEGINNING DATE:</b> 01/00/1900 <b>PERIOD ENDING DATE:</b> 01/00/1900	

	<b>PROJECT CODE:</b> 0 <b>AGENCY NAME:</b> 0 <b>PROJECT TITLE:</b> 0
--	--

	TOTAL VALUE	VALUE OF WORK COMPLETED			PERCENT COMPLETE
		PREVIOUS VALUE TO DATE	VALUE THIS REPORT	CURRENT VALUE TO DATE	
	A	B	C	D = B + C	E = D / A
Original Contract Line Items (from CO-12, PART B)	\$ -	\$ -	\$ -	\$ -	0%
Approved Change Orders (from CO-12, PART C)	\$ -	\$ -	\$ -	\$ -	0%
<b>ADJUSTED CONTRACT TOTAL</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>0%</b>
Retainage <i>Retainage Percentage: #DIV/0!</i>		\$ -	\$ -	\$ -	
<b>NET REQUISITION AMOUNT</b>		<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	

Amount Requested

**CONTRACTOR CERTIFICATION**

The undersigned Contractor requests payment of that portion of the contract price shown on the last line of the foregoing Schedule of Values, and represents and warrants to the Owner that: (1) the data shown on the Schedule of Values is accurate and correct; (2) the Work covered by this Certificate has been completed in accordance with the Contract Documents; (3) all previous progress payments received from Owner on account of Work done under this Contract have been applied to discharge in full (except for allowable retainage) all obligations of Contractor incurred in connection with Work covered by prior Certificates for Payment ( not applicable for Pay Request 1 ) ; (4) title to all materials and equipment for which payment is requested in this Certificate, whether or not incorporated in said Work, will pass to Owner at time of payment free and clear of all liens, claims, security interests and encumbrances (except such materials and equipment which are covered by a Bond previously accepted by Owner).

**FEIN #:** \*\*\* enter FEIN in Step 2 \*\*\*      **Contractor:** \*\*\* enter Contractor name in Step 2 \*\*\*

**Date:** January 0, 1900      **By:** \_\_\_\_\_  
*signature*

**Typed Name:** \*\*\* enter Contractor Representative's Name in Step 3 \*\*\*

**ARCHITECT/ENGINEER CERTIFICATION**

This is to certify that, in accordance with the terms of a contract for Project Number \_\_\_\_\_ executed the day of \_\_\_\_\_, by and between \_\_\_\_\_, the contractor, and the Commonwealth of Virginia, \_\_\_\_\_, the Owner, for work at \_\_\_\_\_, there is due to the Contractor the amount of \_\_\_\_\_  
 #NAME?

**Architect/Engineer:** \_\_\_\_\_

**By:** \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_  
*signature*      *printed name*      *date*

**AGENCY ACTION**

Amount approved for payment this certificate is: \_\_\_\_\_ Dollars ( \_\_\_\_\_ )

**By:** \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_  
*signature*      *title*      *date*

**By:** \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_  
*signature*      *title*      *date*





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**COMMONWEALTH OF VIRGINIA  
AFFIDAVIT OF PAYMENT OF CLAIMS**

By:

This day \_\_\_\_\_ personally appeared before me,  
\_\_\_\_\_, a Notary Public in and for  
the City (County) of \_\_\_\_\_, \_\_\_\_\_ and, being by me  
first duly sworn, states that all subcontractors and suppliers of labor and materials have been paid all sums due  
them for work performed or materials furnished in the performance of the Contract between the Commonwealth  
of Virginia, \_\_\_\_\_, Owner,  
and \_\_\_\_\_, Contractor, dated  
\_\_\_\_\_, 20\_\_\_\_, for the construction of \_\_\_\_\_  
\_\_\_\_\_

or arrangements have been made by the Contractor satisfactory to such subcontractors and suppliers with respect  
to payments of such sums as may be due them by the Contractor.

*Typed Contractor Name*

By:

*Signature*

*Typed Name & Title of Person Signing*

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_. My commission expires on  
the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Notary Public

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**CERTIFICATE OF COMPLETION BY ARCHITECT/ENGINEER  
or PROJECT MANAGER**

Date:

TO: Division of Engineering & Buildings  
1100 Bank Street, 6<sup>th</sup> Floor  
Richmond, Virginia 23219

**PROJECT TITLE:**  
**PROJECT NO:**  
**INSTITUTION/AGENCY:**  
**ADDRESS:**

In accordance with the requirements of the Contract Between Owner and Architect / Engineer for Professional Services (Form CO-3) or the Contract Between Owner and Project Manager and based upon the knowledge gained in the performance of the services required in said Agreement, the undersigned hereby states that the above named project was fully completed in accordance with the requirements of the Contract Documents on \_\_\_\_\_.  
(date)

All applicable tests, certificates and regulatory inspections required by the \_\_\_\_\_ edition of the Virginia Uniform Statewide Building Code, which was the basis of the design of the project, have been performed and the Owner has been provided with a copy of each report. A copy of the Final Report of Structural & Special Inspections (Form CO-13.1b) is attached to this certificate. All deficiencies noted during the inspection have been corrected or resolved.

The handicapped standards required by Chapter 4 of the applicable A/E Manual, as revised, have been met.

The Owner has been provided with a copy of all warranties and guarantees, including the starting date(s) of all warranties and guarantees, written and unwritten, required by the Contract Documents.

(Typed Firm Name)

By:

(Typed Name & Title)

Attachments:  
Final Report of Structural & Special Inspections (Form CO-13.1b)

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**ARCHITECT/ENGINEER'S  
CERTIFICATE OF SUBSTANTIAL COMPLETION**

Date:

TO: Division of Engineering & Buildings  
1100 Bank Street, 6<sup>th</sup> Floor  
Richmond, Virginia 23219

**PROJECT TITLE:**

**PROJECT NO:**

**INSTITUTION/AGENCY:**

**ADDRESS:**

In accordance with the requirements of the Agreement between the Owner and the Architect / Engineer and based upon the knowledge gained in the performance of the architectural / engineering services provided in said Agreement and the reports of the Owner's Inspection and Testing entities, the undersigned Architect / Engineer states that the following portions of the project named above are substantially complete in accordance with the requirements of the Contract Documents and are recommended for occupancy: *(Indicate portions which are recommended for occupancy)*

All applicable tests, certificates and regulatory inspections required by the \_\_\_\_\_ edition of the Virginia Uniform Statewide Building Code, which was the basis of the design of the project, have been performed with respect to the substantially completed portions of the project and the Owner has been provided with a copy of each report, except for the following: \_\_\_\_\_

The handicapped standards required by Chapter 4 of the applicable A/E Manual, as revised, have been met. A copy of the Final Report of Structural & Special Inspections, Form CO-13.1b, is attached to this certificate.

A tentative list of unfinished Work and defective Work, referred to as the "punch list", is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within \_\_\_\_\_ days of the above date of Substantial Completion.

(Typed Name of Architect / Engineer)

By:

(Signature in ink)

(Typed Name & Title)

The following documents are attached to and made a part of this Certificate:

- Final Report of Structural & Special Inspections (Form CO-13.1b)
- Checklist for Beneficial Occupancy (Form CO-13.3b)
- Punch list containing page 1 through \_\_\_\_\_

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INSTITUTION/AGENCY:

\_\_\_\_\_

PROJECT TITLE:

\_\_\_\_\_

PROJECT NO:

\_\_\_\_\_

A/E OF RECORD:

\_\_\_\_\_

To the best of my information, knowledge, and belief, the Structural & Special Inspections required for this project, and itemized in the Form CO-6b, Special Inspections listing attached to the Form CO-6a, Statement of Structural and Special Inspections, submitted for permit, have been completed.

The discrepancies that remain outstanding since the last interim report dated \_\_\_\_\_, corrected or have been resolved as follows:

*(Attach 8-1/2 x 11 continuation sheet(s) if required to complete the description of corrections or resolution of deviations)*

Respectfully submitted,

**STRUCTURAL ENGINEER  
OF RECORD**

**A/E of RECORD**

**SMOKE CONTROL RDP**

Signature: \_\_\_\_\_  
(Date)

Signature: \_\_\_\_\_  
(Date)

Signature: \_\_\_\_\_  
(Date)

Name: \_\_\_\_\_  
(Type or Print)

Name: \_\_\_\_\_  
(Type or Print)

Name: \_\_\_\_\_  
(Type or Print)

**PROJECT INSPECTOR**

**AGENCY PROJECT MANAGER**

Signature: \_\_\_\_\_  
(Date)

Signature: \_\_\_\_\_  
(Date)

Name: \_\_\_\_\_  
(Type or Print)

Name: \_\_\_\_\_  
(Type or Print)

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## CERTIFICATE OF COMPLETION BY CONTRACTOR

Date:

TO: Division of Engineering & Buildings  
1100 Bank Street, 6<sup>th</sup> Floor  
Richmond, Virginia 23219

**PROJECT TITLE:**

**PROJECT NO:**

**INSTITUTION/AGENCY:**

**ADDRESS:**

In accordance with the requirements of the Contract between Owner and Contractor (Form CO-9), the undersigned Contractor hereby states that the above named project has been fully completed in accordance with the requirements of the Contract Documents as modified by approved change orders.

All applicable tests, certificates and regulatory inspections required by the Virginia Uniform Statewide Building Code and the Contract Documents have been performed with respect to the completed project and the Owner has been provided with a copy of each report.

As-built marked up prints of the completed project have been provided to the Architect/Engineer as required by the Contract Documents.

The Owner has been provided with a copy of all warranties and guarantees, including the starting date(s) of all warranties and guarantees, written and unwritten, required by the Contract Documents.

All training, operating instructions and maintenance manuals required by the Contract Documents have been provided to the Owner.

(Typed Contractor Name)

By:

(Typed Name & Title of Person Signing)

cc: Agency  
A/E

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**CERTIFICATE OF PARTIAL OR SUBSTANTIAL COMPLETION BY CONTRACTOR**

Date:

TO: Division of Engineering & Buildings  
1100 Bank Street, 6<sup>th</sup> Floor  
Richmond, Virginia 23219

**PROJECT TITLE:**

**PROJECT NO:**

**INSTITUTION/AGENCY:**

**ADDRESS:**

In accordance with the requirements of the Agreement between the Owner and the Contractor, the undersigned Contractor hereby states that portions of the above named project are substantially completed in accordance with the requirements of the Contract Documents as modified by approved change orders. Those portions of the project now substantially complete are: *(list or describe)*

All applicable tests, certificates and regulatory inspections required by the Virginia Uniform Statewide Building Code and the Contract Documents have been performed with respect to the substantially completed portions of the project and the Owner has been provided with a copy of each report.

As-built marked up prints of the substantially completed portions of the project have been provided to the Architect/Engineer as required by the Contract Documents.

The Owner has been provided with a copy of all warranties and guarantees, including the starting date(s) of all warranties and guarantees, written and unwritten, required by the Contract Documents with respect to the completed portions of the project, except as follows:

All training, operating instructions and maintenance manuals required by the Contract Documents have been provided to the Owner, except as follows: *(list or describe)*

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents.

Typed Contractor Name

By:

Typed Name & Title

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**FORT MONROE COMMUNITY CENTER**  
**ROOF REPLACEMENT**  
**Project Number: 360-A9360-001**

LIST OF DRAWINGS

G0.01	TITLE SHEET
G0.02	ABBREVIATIONS
AD1.01	ROOF DEMOLITION PLAN
AD1.02	ROOF DEMOLITION PHOTO REFERENCES
AD5.01	ROOF DEMOLITION DETAILS
A2.01	ROOF PLAN
A3.01	RTE SCHEDULE
A5.01	DETAILS
A5.02	DETAILS

END OF LIST OF DRAWINGS

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**STATEMENT OF VUSBC SPECIAL INSPECTIONS**

(STATE OWNED BUILDINGS)

DATE: March 10, 2020

INSTITUTION/AGENCY: **Fort Monroe Authority**

PROJECT TITLE: **Fort Monroe Community Roof Replacement**

PROJECT CODE: **360-A9360-001**

A/E OF RECORD: **Hudson + Associates Architects**

The following firms and/or individuals (with address and telephone number shown) are designated to perform the Special Inspections required herein. The firm/individual has the experience, qualifications, certifications and/or licenses required to perform the functions indicated.

**OWNER'S TESTING AND INSPECTION SERVICE**

**OWNER'S TEST LAB**

**A/E of RECORD INSPECTION**

**SMOKE CONTROL INSPECTION & TESTING**

Name: Froeling & Robertson, Inc	Name: Hudson + Associates	Name: NA
Address (St): 833 Professional Place, West	Address (St): 120 West Queens Way, suite 201	Address (St):
City, St., Zip: Chesapeake, VA 23320-3601	City, St., Zip: Hampton, VA 23669	City, St., Zip:
Phone: 757-436-1111	Phone: 757-722-1964	Phone:

**OWNER'S PROJECT INSPECTOR**

**OWNER'S PROJECT MANAGER**

Name: To be assigned

Phone: T.B.D

Name: Mike Newberry

Phone: 757-810-4361

Inspection and/or Testing responsibilities are indicated on the attached List of Special Inspections, Form CO-6b. Copies of all test data and reports shall be provided to the Architect/Engineer of Record and to the Owner's Project Manager on a timely basis. The Contractor shall be notified of all deficiencies and discrepancies in a timely manner so that corrective action can be taken.

**PROFESSIONAL OVERSIGHT AND CERTIFICATION**

**STRUCTURAL ENGINEER OF RECORD**

**A/E of RECORD**

**SMOKE CONTROL RDP**

Name: NA	Name: Richard Corner	Name: NA
Address (St):	Address (St): 120 West Queens Way, suite 201	Address (St):
City, St., Zip:	City, St., Zip: Hampton, VA 23669	City, St., Zip:
Phone:	Phone: 757-722-1964	Phone:

(Signature) (Date) (Signature) (Date) (Signature) (Date)

**AGENCY REQUEST FOR APPROVAL**

Submitting Agency:

Representative's Name:

Phone:

(Signature) (Date)

**CODE OFFICIAL'S ACCEPTANCE**

- Acceptable as submitted
- Acceptable as marked

By: \_\_\_\_\_  
For or By Director (Date)  
Division of Engineering & Buildings

MATERIAL/ ACTIVITY	TYPE OF INSPECTION (A/E add lines as needed to identify other required items)	THIS PROJ ?	REFERENCE	INSPECTION / TEST BY *				
				OWNERS TEST LAB	A/E OF RECORD	SMOKE CONTROL	PROJECT INSPECTOR	CONTRACTOR / SUPPLIER
<b>FOUNDATIONS</b>								
Soil	Classify & Test Existing Soils & Fill Materials		Specs, 1705.6	X (Spot)				
Soil	Compaction Of Fill Materials		Specs, 1705.6	X				
Soil	Bearing At Bottom Of Footing Excavations		Specs, 1705.6	X (Spot)				
Piles	Driving Records, Tip & Cutoff Elevations		1705.7, 1705.9	X	4			
Piles	Load Test		1705.7	X	4			
Caissons	Drilling, Size, Bearing Conditions, Materials		1705.8, 1705.3	X				
<b>CONCRETE CONSTRUCTION</b>								
Concrete	Ready-Mix Plant Quality Control		Specs, 1704.2.5		2			X, 1
Concrete	Mix Design Tests And Certificates		Specs, 1705.3		X			X, 1
Reinf. Steel	Shop Drawings Of Reinforcing Steel		Specs		X			
Reinf. Steel	Placement Of Reinforcing Steel		1705.3	X (Spot)	X (Spot)		X	
Reinf. Steel	Welding		1705.2.2	X (Spot)	2			X, 1
Reinf. Steel	Special Construction		1704.5.7		2			
Formwork	Shape, Location, Dimensions		1705.3	X (Spot)			X	X
Formwork	Removal and Reshoring		1705.3	X (Spot)				
Concrete	Test Cylinders & Strength Test		1705.3, 1910.10	X	4			
Concrete	Mix Proportions & Mix On Delivery Tickets		1705.3				X (Spot)	
Concrete	Slump Test		1705.3	X	4		X	
Concrete	Placement Procedures		1705.3	X	X (Spot)		X (Spot)	
Concrete	Curing Temperatures & Techniques		1705.3	X			X	
Prestressed	Prestressing Procedures & Forces		1705.3	X	2			X, 1
Prestressed	Shop Drawings Of Prestressed Units		Specs		X			
Precast	Quality Control Of Manufacturer		1704.2.5		2			X, 1
Precast	Shop Drawings Of Precast		Specs		X			
Precast	Erection Of Precast		1705.3	X (Spot)	X (Spot)		X	X
Precast	Inspection Of Connections		1705.3	X (Spot)				
Shotcrete	Reinforcing Steel-Test Panel		1908.5, 1705.3	X	4			
Anchors	Anchors In Concrete		Specs, 1705.2.1, 1909	X				

\* The numbers listed refer to notes on Page 5.



MATERIAL/ ACTIVITY	TYPE OF INSPECTION <i>(A/E add lines as needed to identify other required items)</i>	THIS PROJ ?	REFERENCE	INSPECTION / TEST BY *				
				OWNERS TEST LAB	A/E OF RECORD	SMOKE CONTROL	PROJECT INSPECTOR	CONTRACTOR / SUPPLIER

**SEISMIC FORCE RESISTANCE INSPECTIONS (as required by VUSBC 1705.12)**

*(Note: SDC refers to Seismic Design Category.)*

Structural Steel	Welding and Bolting		1705.12.1	X (Spot)					
Wood	Field Glueing		1705.12.2	X					
Wood	Fastening Of Seismic Force Resistance System		1705.12.2	X (Spot)			X		
Light Gage Steel	Fastening		1705.12.3	X (Spot)			X		
Components	Mechanical & Electrical - Anchorage and Labeling (SDC = C)		1705.12.4, 1705.12.6	X (Spot)					
Components	Architectural - Cladding, Veneer, Non-Bearing Walls (SDC = D)		1705.12.5	X (Spot)					
Components	Access Floors (SDC = D)		1705.12.5.1	X (Spot)					
Components	Storage Racks (SDC = D)		1705.12.7	X (Spot)					

**SEISMIC RESISTANCE TESTING (as required by VUSBC 1705.13)**

Structural Steel	Steel Systems and Elements		1705.13.1, AISC 341						
Non-Structural	Components-Mfr's Certificate of Compliance		1705.13.2		2				3
Non-Structural	Designated Systems-Certificate of Compliance		1705.13.3		2				3
Structural	Isolation Systems		1705.13.4	X					

**WOOD & LIGHT GAGE STEEL CONSTRUCTION**

Fabrication	Quality Control Inspection Of Shop		1704.2.5		2				X, 1
Wood	Grade Stamp		Specs, 1703.5		X (Spot)				X
Wood/Light Gage	Fastening Per Code And Drawings		1705.2.2, 1705.5.1		X (Spot)				X
Trusses	Shop Drawings		Specs		X				
Trusses	Truss Placement, Bracing and Fastening & Anchorage		Specs, 1705.2.4, 1705.5.2		X (Spot)				X
Laminates	Shop Drawings		Specs		X				
Laminates	Identification Per Shop Drawings		Specs		X (Spot)				X
Sheathing	Grade Stamp, Thickness & Fastening		Specs, 1705.5.1		X (Spot)				X

\* The numbers listed refer to notes on Page 5.

MATERIAL/ ACTIVITY	TYPE OF INSPECTION <i>(A/E add lines as needed to identify other required items)</i>	THIS PROJ ?	REFERENCE	INSPECTION / TEST BY *				
				OWNERS TEST LAB	A/E OF RECORD	SMOKE CONTROL	PROJECT INSPECTOR	CONTRACTOR / SUPPLIER
<b>FIREPROOFING</b>								
Spray-on	Manufacturer's Data		Specs					
Spray-on	Surface Conditions		1705.14.2	X				3
Spray-on	Application		1705.14.3	X				3
Spray-on	Thickness		1705.14.4	X				
Spray-on	Density		1705.14.5	X				
Spray-on	Bond Strength		1705.14.6	X				
Mastic/Intumescent	Fire-Resistant Coatings - Materials, Application		1705.15	X (Spot)			X	3
GWB Fireproof	Manufacturer's Data		Specs	X				3
GWB Fireproof	Placement Of Materials		Specs	X (Spot)			X	
Fire Wall Assembly	Manufacturer's Data		Specs, 706.2	X				3
Fire Wall Assembly	Placement Of Materials		Specs, 706.2	X (Spot)			X	
<b>EXTERIOR INSULATION &amp; FINISH SYSTEMS (EIFS)</b>								
Materials	Manufacturer's Data		Specs		X			3
Preparation	Condition Of Substrate		Specs, 1705.16.1	X (Spot)			X	
Application	Methods, Proportions & Thickness Of Installation		Specs, 1705.16.1	X (Spot)			X	
<b>SMOKE CONTROL ( see note 5 )</b>								
Ducts	Device Location And Air Duct Leakage		1705.18.1				X	
System	Pressure Difference, Flow Measurements & Detection Testing		1705.18.1				X	
Controls	Activation Sequence		1705.18.1				X	

\* The numbers listed refer to notes on Page 5.

**2015 VUSBC SPECIAL INSPECTIONS**

(STATE OWNED BUILDINGS)

MATERIAL/ ACTIVITY	TYPE OF INSPECTION <i>(A/E add lines as needed to identify other required items)</i>	THIS PROJ ?	REFERENCE	INSPECTION / TEST BY *			
				OWNERS TEST LAB	A/E OF RECORD	SMOKE CONTROL	PROJECT INSPECTOR

**NOTES:**

1. Fabricator, supplier, ready-mixed plant or other production plant shall provide certificates from an approved independent inspection, testing or quality assurance agency attesting that the plant meets at least one of the following criteria:
  - a. The plant is a certified production plant meeting the quality assurance standards of a recognized national standards organization for that product.
  - b. The plant maintains an agreement with an independent inspection or quality assurance agency to conduct periodic in-plant quality assurance inspections. The frequency of these inspections shall not be less than one every six months.
  - c. The plant has an in-shop quality assurance inspection program by an independent testing or quality assurance agency for the work/product to be provided on this project.
2. A/E shall review fabricator/supplier/producer certificates for conformance with appropriate standards of practice and quality assurance.
3. Contractor/supplier shall submit manufacturer's certificates of compliance for the materials/products.
4. Reviews records and test results for conformance with requirements.
5. Special inspection firm shall have expertise in fire protection engineering, mechanical engineering, and certification as an air balancer. The special inspector listed on the cover page and the Agency are responsible for verifying that the inspector (s) for smoke control is qualified as required by VUSBC 1705.18.2.
6. Unless noted otherwise, the reference numbers listed refer to the 2015 VUSBC.

\* The numbers listed refer to notes on Page 5.

## **Special Requirements for Low Slope Roofing Membranes**

### Part 1 - General

#### 1.1 Summary

- A. The provisions of this Section shall govern the installation of low-slope flexible membrane roofing in coordination with the roofing specifications.
- B. This section includes special provisions for state roofing membranes.
- C. This section includes the coordination with owner's Roof Consultants and Roof Inspector.

#### 1.2 Owner's Roofing Inspection

- A. The Owner will have a full-time Observer/inspector on site while the roof is being applied. The contractor shall coordinate the roofing installation to provide 24 hours notice of roofing operations to the Roof Observer. The contractor shall allow the Roof Observer access to the work.
- B. Installation of roofing materials shall not be started without the Roof Observer having a copy of the A/E approved shop drawings showing the ASTM's or other standards of the roofing materials.
- C. The Roof Observer will check all materials and application procedures and prepare a daily written report.
- D. A copy of the daily report shall be given to the contractor, A/E, and the owner.
- E. Roof Observer/Inspector's Scope of Work:
  - (1) The Observer/Inspector shall monitor the work for compliance with the contract documents
  - (2) The Observer/Inspector shall continuously monitor and observe the work at the point of application during installation of the roof.
  - (3) The Observer/Inspector shall immediately report any deficiencies or deviations to the Architect and Owner. A written report shall follow an oral report within two business days.
  - (4) The Observer/Inspector may recommend suspension of work or rejection of non-complying work to the A/E and Owner.
  - (5) The Inspector shall not:
    - a. Authorize deviations from the contract documents
    - b. Enter the area of responsibility of the Contractor's superintendent.
    - c. Issue orders on any aspect of construction means, methods, techniques, sequences, procedures, or safety in connection with the work

#### 1.3 Pre-Roofing Conference

- A. A pre-roofing conference is required and shall held before ordering roofing materials.
- B. Representatives of the owner, Roof Observer/inspector, architect, general contractor, roofing contractor, deck contractor, mechanical contractor, and roofing manufacturer shall attend.
- C. Review of the plans, specifications, flashing details, work scheduling, and workmanship standards is required. Problems and discrepancies shall be resolved.
- D. A written record of proceedings shall be prepared and made part of the job record.

## 1.4 Guarantee

- A. Provide the following roofing contractor's guarantee on the General Contractor Guarantee form:

"The roofing contractor shall guarantee materials and workmanship associated with the roofing, flashings, and sheet metal work incidental to the work required under the roofing subcontract, against defect due to faulty materials or workmanship for a period of two (2) years from the date of final completion of the entire project. It is understood and agreed by all parties hereto that the responsibility of the roofing contractor under this guarantee form or any contract document, shall be in accordance with the roofing contractor's limited guarantee."

- B. Provide the following Owners Agreement on the Contractor Guarantee form:

"The undersigned named Owner for the Commonwealth, agrees, from the date of final completion of the entire project, to maintain the roof in accordance with the manufacturer's written requirements and also agrees to avoid damage to the roof surface by any parties under his control working or walking on the roof. The Owner recognizes his responsibility to inspect the roof semiannually."

- C. Contractor's Guarantee for Reroofing (in no case shall the guarantee be less than as specified below, see membrane specification for additional warranty requirements, if any)
- a. The (General) Contractor shall furnish, as a minimum, a manufacturer's 20-year total system material and labor warranty / guarantee with no monetary limitations (NDL no dollar limit). From the date of Final Completion of the project.
  - b. The contractor shall provide a workmanship warranty agreeing to maintain the entire roof system(s) in a completely watertight condition at no cost to the Owner for two (2) years from date of final completion. Sheet metal flashing incidental to the roofing shall be covered under the manufacturer's warranty.

## 1.5 Materials Certification

- A. The materials shall be labeled with ASTM certification numbers or other specified product certifications or the Contractor shall give to the A/E the roofing manufacturer's certification that the roofing materials being furnished comply with specified ASTM and approved standards.
- B. The owner's full-time roof inspector shall verify the materials received are as specified and in accordance with A/E approved shop drawings before roofing materials may be installed.

## 1.6 Roofing Manufacturer's Inspections

- A. The roofing manufacturer's representative shall inspect the roofing installation procedures at the start of the roofing membrane installation and inspect the completed installation

## 1.7 Wind Uplift and Edge Securement



- A. Low slope membrane roofs, except gutters, shall be designed and installed for wind resistance in accordance with ANSI/SPRI ES-1.

#### 1.8 Approved Applicator

- A Roofing and base flashing applicator shall be approved by the materials manufacturer.

#### 1.9 Roof Protection

- A. Before moving equipment or materials over a roof, the Owner, General Contractor, roofing contractor, and any of their agents must protect the roof from damage during and following roofing work.
- B. Movement of equipment and materials without roof protection shall be cause for the Owner, General Contractor, roofing contractor or A/E to stop work until protection is provided and any damage is corrected.
- C. The Owner's roofing inspector shall record all such violations.

#### 1.10 Pre-Final Inspection Survey

Unless a written waiver has been approved by the Director of DEB the following provisions shall be provided by the contractor:

- A. The A/E shall notify the Owner, Contractor, and roofing contractor (in writing) that he has inspected the roof(s) and finds it (them) sufficiently complete to permit a roofing survey. In no case shall the survey be made earlier than forty days before the substantial completion inspection.
- B. An independent roof survey inspection service or laboratory shall survey the roof(s). The service shall use infrared, nuclear moisture detection, impedance survey or electronic leak detection methods. Roof probes or cuts shall not void the Contractor's two year guarantee and the manufacturer's warranty/guarantee.
- C. The roofing contractor shall cooperate and assist the inspection service by making and repairing any required cores, test cuts, or probes in such a way that Manufacturer's and Contractor's warranty/guarantees are not voided.
- D. Copies of all survey reports shall be delivered to the Owner, DEB, A/E, Contractor, and roofing contractor.
- E. The Owner shall pay for the service unless the survey shows roofing deficiencies caused by improper materials, poor workmanship, or Contractor negligence. In that case the Contractor, at his expense, shall repair or replace the roof(s) and provide additional surveys until the roofing work complies with the contract documents. All corrective work shall be completed before the final inspection. Acceptance of the roofing system shall be contingent on a roofing survey report that indicates the presence of no detrimental amount of moisture; for example, moisture that would cause a significant lowering of the thermal resistance of the roof; separation of the roofing plies; blisters; etc.. Insulation or roofing materials determined in the roof survey to have detrimental amounts of moisture by the Consultant and any materials covering the insulation shall be replaced by the Contractor at no cost to the Owner.
- F. In any case where the roofing survey reports insulation that has lost more than 20% of its dry thermal resistance (R-value) the (wet) insulation and any materials covering the insulation shall be replaced by the Contractor at no cost to the Owner.

#### 1.11 Final Inspection

The following items must be given to the Owner's representative at the Final Inspection:

- A. A copy of the (general) contractor's and roofing contractor's two-year guarantee.
- B. A copy of the roofing manufacturer's standard warranty/guarantee.
- C. The Contractor shall assist the A/E in preparing the appropriate copies of the History of Roofing Installation, Sample Form A; Roof Information Worksheet -Built-Up Roofing, Sample Form B; or Roof Information Worksheet - Single Membrane Roofing, Sample Form E. The A/E shall obtain forms from the DGS Forms Webpage and complete all applicable items.

#### 1.12 One Year Inspection

Representatives of the Owner (and the A/E), the Contractor, the roofing subcontractor, and the membrane manufacturer shall inspect the roof(s) between nine months and one year before the closing of the General Contractors one year guarantee.

#### 1.13 Two Year Inspection.

The Owner shall also have the roof inspected at least three months before the two year guarantee expires and notify the Contractor in writing of any defects noted. The Owner shall require that any defects be corrected at least 30 days prior to expiration of the guarantee.

### Part 2 Products (Not Used) See Roof Membrane Specifications

### Part 3 Execution

#### 3.1 Roof Slope

- A. All roofs shall slope 1/4" per foot, minimum, to drains on all new roofs, unless otherwise specified.
- B. Dead level valleys are unacceptable. Cricket valleys shall slope a minimum of 1/8" per foot unless otherwise specified.

#### 3.2 Insulation

Unless otherwise required to comply with a Manufacturers roofing system, insulation installation shall be as follows:

- A. Meet C or R value as specified elsewhere.
- B. Provide a minimum 2 layers, if thickness permits
- C. Provide staggered joints between layers of the insulation.
- D. Fasten the insulation as required elsewhere in the specifications. If no requirements are listed mechanically fasten the first layer to metal deck. Cold applied adhesives and/or low rise foam products are acceptable for the attachment of the first layer to concrete decks, and for attachment of the individual insulation layers to each other contingent upon meeting FM I-90 wind uplift rating and the specified roofing material manufacturer's warranty.
- E, Compatible Insulation: The contractor shall assure the type of insulation is entirely compatible with contiguous, specified roofing materials.

#### 3.3 Rooftop Equipment

- A. Provide clearance for easy re-roofing.

- B. Comply with NRCA Manual recommendations for minimum height of equipment above the roof membrane when equipment is supported above the roof membrane.
- C. Provide prefabricated walks to and around equipment that requires servicing. Walks must not block roof drainage.

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**FORT MONROE COMMUNITY CENTER**

**ROOF REPLACEMENT**

**Project Number: 360-A9360-001**

**SECTION 011000 - SUMMARY OF WORK**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 PROJECT DESCRIPTION

- A. The Project consists of the reroofing of an existing jail facility, as shown on Contract Documents prepared by Hudson + Associates, Architects dated March 1 2011.

1. Project Name: Fort Monroe Community Center Roof Replacement  
100 Stilwell Dr.  
Hampton, VA 23651

2. Owner: City of Hampton  
22 Lincoln  
Hampton, VA 23669

3. Architect: Hudson + Associates, Architects  
120 West Queens Way, Suite 201  
Hampton, VA 23669

- B. This project consists of the removal and replacement of a total of 23,700 square feet (SF) of EPDM, with a Fleece back PVC membrane roof over flat insulation systems. The existing building has two major roof areas the administrations and craft room portions of the building are under roof area A. The roof is approximately 13'-4" to structural bearing. The activity portion which encompasses the gymnasium and the pool is under roof area B with a bearing height of 23'-4". The existing structure slopes at 0.25"/12" at all roof areas so 0.5":12" crickets will be needed to divert water towards the main drainage system. This project will also replace the existing roof drains and install new overflow drains. The exiting roof hatch will be replaced and supplied with a new safety rail. A new wall mounted roof ladder will connect The upper and lower roof areas. Fall protection rails will be installed adjacent to the roof top equipment closer than 15'-0" to the roof edge. New metal edge fascia is to be installed on the exterior faces of the parapets. There is currently a conduit mounted on the inside of the parapet on roof B which will be removed and a new conduit installed to support the security camera.

The roof deck over the pool area (5,100 SF) is rusted and damaged and will be replaced with new painted galvanized metal roof deck. The deck over the gymnasium is a perforated acoustic deck with fiberglass batts in the flutes. This deck is to remain so care must be taken to preserve the fiberglass in place.

1.3 LIST OF DRAWINGS

- A. T0.01 TITLE SHEET  
B. A0.01 ABBREVIATIONS  
C. AD1.01 ROOF DEMOLITION PLAN

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- D. AD1.02 ROOF DEMOLITION PHOTO REFERENCES
- E. AD5.01 ROOF DEMOLITION DETAILS
- F. A2.01 ROOF PLAN
- G. A3.01 RTE SCHEDULE
- H. A5.01 DETAILS
- I. A5.02 DETAILS

1.4 CONTRACTOR USE OF PREMISES

- A. General: Use of premises, work and storage areas shall be discussed at the pre-construction conference. In general, areas will be made available immediately adjacent to the building for the storage of materials, and work may be carried out per the Contractor's schedule to complete the project in the prescribed time frames unless other arrangements are made at the pre-construction conference.
- B. The Contractor shall protect the existing facilities at all times during the course of construction. Any damages caused or patching needed as a result of their activities shall be repaired at no additional cost to the Owner. In general, patching, repair, and renovation work is intended to match, compliment and align with existing conditions.
- C. The Contractor is to maintain the structural integrity of the existing building at all times. At no time is the removal or demolition of a structural element to occur without the approval of the Owner.
- D. The Contractor shall not block any egress point from the building. All exit doors shall remain open during construction and debris shall not be allowed to collect in front of said egress points.

1.5 USE OF PREMISES

- A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Owner Occupancy: Allow for Owner occupancy of Project site and use by the public.
  - 2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
  - 3. All roof work can be conducted during business hours; all electrical rerouting and plumbing work can be conducted between the hours of 5:00am and 7:00pm. Any work needing to be conducted outside of this time window must be approved by City facilities maintenance 24 hours prior to the work being conducted.

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- B. Use of Existing Building: Maintain existing building in a weather tight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.
- C. When the Contractor is required to work within the building, he shall be responsible for cleaning the work area at the end of each day and returning it to its original condition. Failure of the Contractor to maintain a clean work environment within the building shall result in the Contractor's pay request being withheld until deficiencies are corrected.
- D. Saw cutting of wood blocking shall not be conducted on the roof the new roof area. All wood cutting shall be conducted at grade and transported to the roof for installation.
- E. The roof can be accessed from the grounds surrounding the building with the exception of fenced areas on the north and partial east elevations. The roof replacement areas shall not be staged or material rolled across the roof to remain. The roof to remain shall have only the foot traffic to conduct the work necessary to extend the manufacturer's warranty.
- F. Contractor shall not have access to lounges, vending machines, restrooms or telephones in the existing building. See Section 01500 for temporary facilities requirements.
- G. Condition of the Existing Building: The Roofing Contractor will be responsible for maintaining the building in a weather tight condition throughout the construction period and repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period. Any damages caused to the Owner's property or property of any of the Owner's employees as a result of the Contractor's operations shall be repaired to the condition before the damage occurred, at the Contractor's expense. Damages shall be documented by both the Owner and the Contractor on the day of the damage or the next business day. Photographic documentation and an itemized list of damage will be required for all damage claims.
- D. The surrounding lawn and planting areas damaged as a part of the work under this Contract, shall be repaired prior to Substantial Completion.
1. Ruts, in grass areas, created by construction equipment, are to be corrected in the following manner.
    - a. If grass is still present in the rut, pry up the grass with a digging fork. If ruts are shallow, lift the turf so it's 1 to 2 inches above the surrounding grade. Give it time to see if it settles evenly with surrounding turf. If the rut settles unevenly, then correct by cutting sod and adding additional soil, as stated below.
    - b. For ruts deeper than 4 inches, use an edger and slice the grass in the center of the rut and cut sod loose. Lift the sod and fold it up and back so it's resting on surrounding lawn. Loosen soil in the rut, adding more as needed to bring it 1 to 2 inches above the surrounding grade. Flip the turf back into place, water, and wait for it to settle. Take care not to scalp this higher section of lawn when you mow. One (1) month after, roll any high spots that remain so that lawn is flush and smooth.
    - c. If there is no grass present in the rut, loosen soil before adding more soil and seeding. Stick a digging fork into soil beside the rut at a 45-degree angle so the fork's tines are beneath the

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rut. Gently lever soil up by pushing down on the handle. Fill the rut with your soil mix, sow grass seed, and water.

2. Ruts, in planting areas, created by construction equipment, are to be corrected in the following manner.
  - a. If the rut is less than 2-inches deep, pry up the bed with a digging fork, lifting and loosening the dirt and mulch so it's 1 to 2 inches above the surrounding grade. Give it time to see if it settles evenly with surrounding turf. If the rut settles unevenly, then correct by adding additional soil and mulching.
3. For ruts deeper than 4 inches, loosen soil before adding more soil. Stick a digging fork into soil beside the rut at a 45-degree angle so the fork's tines are beneath the rut. Gently lever soil up by pushing down on the handle. Fill the rut with your soil mix, mulch, and water.
4. Soil mix
  - a. To fill in lawn ruts and holes, blend planting soil with sand and/or compost. Usually blending equal parts of each material forms a mix that allows grass to root effectively through the mix into existing soil. Check with your local extension agent or garden center for specific soil recommendations for your area.

E. The Contractor shall submit with their Bid a letter stating their intent and the Manufacturer's intent to warranty roof per the specifications.

F. Fees and Permits

1. Unless otherwise provided in the Contract Documents, the Contractor shall obtain and pay for all public permits and fees, unless noted otherwise. Such permits and fees include but are not necessarily limited to the following:

- a. Building Permit

1.6 MANUFACTURER'S DIRECTIONS

- A. Apply, install, connect and erect manufactured items or materials according to the recommendations of the manufacturer when such recommendations are not in conflict with the Contract Documents.

1.7 CONFLICTS BETWEEN SPECIFICATIONS AND DRAWINGS



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- A. Should any conflict be found in the Contract Documents, the Architect/Engineer shall interpret or construe the Contract Documents so as to secure the most substantial and complete performance of the Work, within the constraints of the order of precedence established by the General Conditions.

1.8 **GOVERNING REGULATIONS/AUTHORITIES**

- A. General: The procedure followed by Architect/Engineer has been to contact governing authorities where necessary, to obtain information needed for the purpose of preparing Contract Documents, recognizing that such information may or may not be of significance in relation to the Contractor's responsibilities for performing the Work. Contact Fort Monroe representative directly for necessary information and decisions having a bearing on performance of the Work.

1.9 **SUBMITTALS**

- A. Permits, License and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

1.10 **COORDINATION AND MEETINGS**

- A. General: Prepare and distribute to each entity performing Work at the project site a written memorandum of instructions on required coordination activities, including required notices, reports, and attendance at meetings. Prepare similar memorandum for separate Contractors where interfacing of Work is required. Architect/Engineer will prepare minutes of meetings where Architect's/Engineer's presence is required.

- B. Preconstruction Conference:

1. Schedule a preconstruction conference before starting construction, at a time convenient to the Owner and the Architect/Engineer, within two (2) weeks prior to the start of the construction. Hold the conference at the Project site.
2. Attendees: Authorized representatives of the Owner, Architect/Engineer, the Contractor and his superintendent, major material suppliers, Mechanical Subcontractor, Electrical Subcontractor and Building Officials(s) having jurisdiction. All Participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:
  - a. Tentative construction schedule
  - b. Critical work sequencing

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- c. Designation of responsible personnel
- d. Procedures for processing field decisions and Change Orders
- e. Procedures for processing Applications for Payment
- f. Distribution of Contract Documents
- g. Submittal of Shop Drawings, Product Data, and Samples
- h. Preparation of record documents
- i. Preparation and maintenance of “As-Built” record drawings
- j. Use of the premises
- k. Parking availability
- l. Storage areas
- m. Equipment deliveries and priorities
- n. Safety procedures
- o. First Aid
- p. Security
- q. Housekeeping
- r. Working hours
- s. Smoking policy
- t. Emergency contact personnel and phone numbers
- u. Sexual offender policy. Refer to Division 1 General Requirements

C. Progress meetings

1. Conduct progress meetings twice a month, at the Project Site, at the Architect’s/Engineer’s Discretion with a date coordinated with the preparation of payment request. Request representatives (at each meeting) of every entity currently involved in coordination or planning. Contractor shall conduct progress meeting. Minutes will be prepared by the Architect/Engineer and distributed to everyone in attendance and to others affected by decisions or actions resulting from each meeting, including the Owner. Progress meetings and other construction meetings involving the Contractor, the Architect/Engineer and Owner may be audio recorded at the Owner’s option without further notice.
2. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.
  - a. Contractor’s Construction Schedule: Refer to requirements of General Conditions.
  - b. Review the present and future needs of each entity present, including the following:
    - 1) Interface requirements.
    - 2) Time.
    - 3) Sequences/phasing plan(s).
    - 4) Status of submittals.
    - 5) Deliveries.
    - 6) Access.

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- 7) Hours of work.
- 8) Hazards and risks.
- 9) Housekeeping.
- 10) Quality and work standards.

c. Request for Information.

d. Change Orders.

e. Review "As Built" record drawings for monthly preparation and maintenance. Architect/Engineer to approve monthly prior to approval of request for payment. Documentation must be acceptable to the Owner or its authorized representative.

f. Documentation of information for payment request.

1.11 Schedule Updating: Revise the construction schedule after the progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule with every pay request submitted.

1.12 COMPLIANCE WITH CODES AND REGULATIONS

A. Contractor shall comply with all recognized codes and regulations governing construction, safety precautions, and other requirements. In case of conflict, the Virginia Uniform Statewide Building Code and Virginia Fire Safety Regulations shall govern. Comply with all OSHA and Accessibility and ADA requirements.

1.13 COMPLIANCE WITH INDUSTRY STANDARDS

A. Where compliance with two (2) or more industry standards or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, the most stringent requirement shall be provided. The most stringent shall be interpreted or construed as being that to secure the most substantial and complete performance of the work as determined by the Architect/Engineer. See Paragraph 1.13 of this section for additional requirements concerning compliance with codes and regulations.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 011000

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SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Sections:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
  - 2. Division 01 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Item No. 1 - Replace Damaged Metal Roof Deck Labor and Material

1. Description: Replace 200 existing damaged sections of metal roof deck (Infill of roof openings from removal of equipment, drains and accessories is included in the base contract.).

a. Unit of Measurement: Square foot of damaged roof deck replaced in excess of Contract requirements.

B. Item No. 2 – Painting Rusted Roof Deck Labor and Material

1. Description: Clean and paint 500 SF rusted section of metal deck with rust converting primer. .

a. Unit of Measurement: Square foot, of rusted deck, including vertical surfaces, painted in excess of Contract requirements.

END OF SECTION 012200

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SECTION 012300 – ADDITIVE BID ITEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for ADDITIVE BID ITEMS.

1.3 DEFINITIONS

- A. Additive bid item: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. Additive bid items described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each additive bid item is the net addition to the Contract Sum to incorporate additive bid items into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the additive bid item into Project.
  - 1. Include as part of each additive bid item, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of additive bid item.
- B. Execute accepted additive bid items under the same conditions as other work of the Contract.
- C. Schedule: A schedule of additive bid items is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each additive bid item.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ADDITIVE BID ITEMS

A. Additive bid item No. 1: Painting of the steel structure in the pool area.

1. Base Bid: Paint the new metal deck and where the new deck fasteners are exposed through the top chord of the steel roof joist.
2. Additive bid item: Paint the new metal deck and existing steel roof joists. This additive bid item is to include the painting of the metal ductwork as well.

END OF SECTION 012300



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**SECTION 015000 - TEMPORARY FACILITIES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.

- B. Temporary construction and support facilities required include but are not limited to:

1. Water service and distribution
2. Temporary electric power and lights
3. Storage facilities for construction materials.
4. Sanitary facilities, including drinking water.
5. Waste disposal services.

- C. 120-volt Power and water are available at the facility for no cost to the Contractor. However, the Contractor shall make all necessary connections and distribution to serve the project. The Contractor shall remove distribution and connection at the conclusion of the work.

- D. Security and protection facilities required include but are not limited to:

1. Temporary fire protection.
2. Barricades, warning signs, lights.
3. Environmental protection.

1.3 QUALITY ASSURANCE

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

1. Building Code requirements.
2. Health and safety regulations.
3. Police, Fire Department and Rescue Squad rules.
4. Environmental protection regulations.

- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition".

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- C. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.

1.4 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site. Remove asphalt mops from roof at the end of each working day.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. If acceptable to the Architect, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
- B. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry."
1. For safety barriers, sidewalk bridges, floor protection and similar uses, provide minimum 5/8-inch- (16-mm-) thick exterior plywood.
- C. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
- D. Protection Blankets: Moving blankets Two-Tone (Blue/Blue) 100% Woven Polyester Moving Blankets, 85lbs per dozen; Size: 72" x 80", of sufficient quantity to cover all of the planes under the curved metal roof.
- E. Drinking Water Facilities: Provide containerized tap-dispenser bottled-water type drinking water units, including paper cup supply.
- F. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material, and supply unit(s) with toilet tissue.
- G. First Aid Supplies: Comply with governing regulations.
- H. Fire Extinguishers: Provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

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2.2 EQUIPMENT

- A. General: Provide new equipment. If acceptable to the Architect, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.
- B. Man lifts capable of reaching the highest plane. It is recommended that the contractor visit the facility prior to bidding and examine the location and placement of the display planes and determine the best equipment for the task.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed.
- C. Locate storage trailers, sanitary facilities and other temporary support facilities for easy access, and where approved by the Owner.
- D. Maintain temporary support facilities until Substantial Completion, or until personnel will no longer be working on the roof.
- E. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
- F. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
- G. Toilets: Install self-contained toilet units in a location approved by the Owner. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted. Have toilets regularly serviced to keep them clean and in good condition.
- H. Collection and Disposal of Waste and Demolition Debris: Collect waste from construction areas and elsewhere daily and remove construction debris from the site weekly or as soon as containers are nearly fully. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste by containerizing properly. Dispose of material in a lawful manner.

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3.2 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Temporary Fire Protection: Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations." Locate fire extinguishers near tankers and kettles and on the roof during roofing operations.
- B. Barricades: Provide temporary barricades where roofing operations are going on to keep people away.
- C. Security: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Remove all equipment from around the building at the end of each working day that would provide a means of egress to the roof, and lock up asphalt kettles at days end.
- D. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment, which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- E. Exhibit Protection: The Contractor is expected to provide the museum personnel a man-lift with operator, protection blankets and tarps so that museum personnel can cover and uncover the exhibits suspended from the roof structure and other floor mounted displays. The highest plane is 70 feet above the first floor. A layout of the planes and their approximate heights are included in the drawings. The protection activity can only be done by museum personnel and will last approximately one week to cover and uncover for each of the three front roof areas.

The Contractor will be required to scaffold over the Apollo capsule. Plywood, blankets and traps will then be placed over the capsule.

- 1. Breach of unprotected portion of the building: In the event that there is a breach into an occupied and or unprotected portion of the facility, as direct result of roofing activities, the Contractor shall immediately notify the Owner, the Owner's representative and the Architect of the breach and immediately begin to secure the breach and clean up the affected area. The Contractor shall not clean ANY debris off ANY exhibit without prior written approval from the Owner and only under the direct supervision of qualified museum personnel. The Contractor shall not leave the site for the day until breach is secured and all clean-up complete and said clean up is reviewed by the Owner's representative of the Architect.
- F. Existing Roof Protection: The Contractor will provide protection for the existing roof during this contract. This protection will be at a minimum 4'-0" x 8'-0" sheets of one half inch thick CDX plywood laid out in a tile pattern over the existing roof adjacent to the metal roof work.

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At no time shall the Contractor traverse an existing roof area without this protection in place. The corners of the plywood sheets shall also be trimmed to create a 4 inch chamfer. No material fabrication or storage shall occur on the existing roof. Scaffolding will be allowed to be erected on the existing roof to access the roof eaves.

- G. Egress door protection: The Contractor shall provide covered overhead protection at all egress doors, parking areas and sidewalks where roof work is occurring above. Said protection shall remain in place for the entire period of time that roof work is occurring. The Contractor shall coordinate with the Owner before the installation and removal of protection measures.

3.3 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse. Any work on the interior of the building will be coordinated with the museum personnel, and by doing so will be required to sign in and out at the first floor security desk.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility at Substantial Completion.

END OF SECTION 01500

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# **HAMPTON PERFORMING & CREATIVE ARTS CENTER ROOF REPLACEMENT**

## SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Demolition and removal of selected portions of building or structure.
- B. Related Sections include the following:
  - 1. Division 01 Section "Summary" for use of premises and Owner-occupancy requirements.
  - 2. Division 01 Section "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for selective demolition operations.
  - 3. Division 01 Section "Cutting and Patching" for cutting and patching procedures.
  - 4. Division 01 Section "Construction Waste Management and Disposal" for disposal of demolished materials.

#### 1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. 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.

#### 1.4 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, Insert description of other items, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

#### 1.5 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:

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1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Locations of proposed dust- and noise-control temporary partitions and means of egress.
6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
7. Means of protection for items to remain and items in path of waste removal from building.

B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1. Comply with submittal requirements in Division 01 Section "Construction Waste Management and Disposal."

### 1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.

### 1.7 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
1. Comply with requirements specified in Division 01 Section "Summary."
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
1. Before selective demolition, Owner will remove the following items:
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
1. Hazardous material remediation is specified elsewhere in the Contract Documents.



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2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  1. Maintain fire-protection facilities in service during selective demolition operations.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and preconstruction videotapes.
  1. Comply with requirements specified in Division 01 Section "Photographic Documentation."
  2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

#### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
  1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

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1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
  - a. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.

### 3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."

### 3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches.
  5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  6. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  8. Dispose of demolished items and materials promptly. Comply with requirements in Division 01 Section "Construction Waste Management and Disposal."
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable,

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protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Roofing: Remove no more existing roofing than can be covered in one day by new roofing and so that building interior remains watertight and weathertight. Refer to Division 07; Section 075419 - Polyvinyl-Chloride (PVC) Roofing for new roofing requirements.
  - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
  - 2. Remove existing roofing system down to metal deck.

### 3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
  - 4. Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

### 3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

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SECTION 053100 - STEEL DECKING

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. Roof deck.

- B. Related Requirements:

- 1. Section 033000 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.
  - 2. Section 035216 "Lightweight Insulating Concrete" for lightweight insulating concrete fill over steel deck.
  - 3. Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.
  - 4. Section 055000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
  - 5. Section 099600 " High-Performance Coatings" for finish painting of deck.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.

- B. Shop Drawings:

- 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of steel deck.

- B. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:

- 1. Power-actuated mechanical fasteners.

- C. Evaluation Reports: For steel deck, from ICC-ES.

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- D. Field quality-control reports.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
  - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Fire-Resistance Ratings: Comply with ASTM E119; 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 ROOF DECK

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Canam Steel Corporation; Canam Group, Inc.
  - 2. Cordeck.
  - 3. Nucor Corp.
  - 4. Roof Deck, Inc.
  - 5. Verco Decking, Inc., a Nucor company.
- B. Mechanical Fasteners (Powder Actuated and Screw Fasteners)
  - 1. Hilti, Inc.
  - 2. Other approved alternative
- C. Sidelap Connectors
  - 1. Hilti, Inc.
  - 2. Verco VSC2
  - 3. ASC Delta Grip

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4. Other approved alternative
- D. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), G90 (Z275) zinc coating.
  2. Deck Profile: Type WR, wide rib.
  3. Profile Depth: 1-1/2 inches (38 mm).
  4. Design Uncoated-Steel Thickness: 0.0295 inch (0.75 mm).
  5. Span Condition: Double span or more.
  6. Side Laps: Interlocking seam.

2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: 10-16 x 3/4 HWH #3 Stainless Steel Screw
- D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- E. Powder Actuated Mechanical Fasteners:
1. Material: AISI 1070 modified
  2. Hardness: Minimum Rockwell Hardness C 54.5
  3. Strength: Minimum tensile strength 285 ksi; minimum shear strength 175 ksi
  4. Design and Manufacture: Knurled shank with forged ballistic point. Manufacturing process shall ensure steel ductility and prevent development of hydrogen embrittlement.
  5. Washers:
    - a. For steel bar joist framing: Minimum 12 mm (0.472 in.) steel washers
  6. Corrosion Resistance:
    - a. For steel roof decks with waterproofing membrane: 5 micron zinc electroplated in accordance with ASTM B 633 SC1 Type III
    - b. For exposed steel roof decks: Minimum AISI 304 stainless steel sealing caps with bonded neoprene washer shall be installed over each fastener
- F. Design Requirements:
1. ICC-ES AC43 or SDI method for diaphragm shear strength and stiffness
  2. FM wind uplift resistance
  3. UL fire classification
  4. Approved Types
    - a. For use with steel bar joist and light structural steel framing supports with top chord or flange thickness 1/8 in. to 3/8 in.:

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- 1) Hilti X-HSN24 (1/8 in. up to and including 3/8 in.)
  - 2) Other approved alternative
- b. For use with structural steel framing supports with top flange thickness 1/4 in. or thicker:
- 1) Hilti X-ENP-19 L15 (1/4 in. or thicker)
  - 2) Other approved alternative

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by powder actuated fastener, and as follows:
  1. Spacing: fasten edge and interior ribs of deck units at each support. Space fasteners 12 inches (305 mm) apart in the field of roof and 6 inches (150 mm) apart in roof corners and perimeter, based on roof-area definitions in FMG Loss Prevention Data Sheet 1-28.



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- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 18 inches (457 mm), and as follows:
  - 1. Mechanically fasten
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:
  - 1. End Joints: Lapped 2 inches (51 mm) minimum.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Prepare test and inspection reports.

3.5 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

END OF SECTION 053100

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SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Metal ladders.
  - 2. Steel pipe railings

1.3 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
  - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Paint products.
- B. Shop Drawings: Show fabrication and installation details for metal fabrications.
  - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
- C. Qualification Data: For qualified professional engineer.
- D. Welding certificates.
- E. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.5 QUALITY ASSURANCE

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- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate 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 Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

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1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- D. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
- E. Post-Installed Anchors: chemical anchors.
  1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
  2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
  1. Products: Subject to compliance with requirements, provide the following:
    - a. 2K Epoxy Zinc Rich Primer Catalyst, by PPG Industries.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.

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3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
- C. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.7 METAL LADDERS

- A. General:
1. Comply with ANSI A14.3 unless otherwise indicated.
- B. Steel Ladders:
1. Space siderails 18 inches (457 mm) apart unless otherwise indicated.
  2. Siderails: Continuous, 3/8-by-2-inch (9.5-by-51-mm) steel flat bars, with eased edges.
  3. Rungs: 1-inch- (25.4-mm-) diameter steel bars.
  4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
  5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout or by use of a knurled bar.

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6. Provide platforms as indicated fabricated from welded or pressure-locked steel bar grating, supported by steel angles. Limit openings in gratings to no more than 3/4 inch (19 mm) in least dimension.
7. Support each ladder at top and bottom and not more than 60 inches (1500 mm) o.c. with welded steel brackets.
8. Galvanize exterior ladders, including brackets and fasteners.

2.8 STEEL PIPE RAILINGS

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately **1/32 inch (1 mm)** unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with welded connections unless otherwise indicated.
- H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove flux immediately.
  4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- I. Form Changes in Direction as Follows:
  1. Radius bends of 4"
- J. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components
- K. Galvanized Railings:

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1. Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
2. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

L. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

2.9 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.
- C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.10 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- B. Finish paint after galvanizing per Section 099600 - High-Performance Coatings.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.



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- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

3.2 **INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS**

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

3.3 **ADJUSTING AND CLEANING**

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 painting Sections.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

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SECTION 061000 - ROUGH CARPENTRY

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. This Section includes the following:
  - 1. Wood blocking and nailers.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

1.4 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

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- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than **10.5 feet (3.2 m)** beyond the centerline of the burners at any time during the test.
1. Treatment shall not promote corrosion of metal fasteners.
  2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
  3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664 and design value adjustment factors shall be calculated according to ASTM D6841.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.
- D. Application: Treat all rough carpentry unless otherwise indicated.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
  2. Nailers.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
- C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

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1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
- B. Power-Driven Fasteners: NES NER-272.
- C. Wood Screws: ASME B18.6.1.
- D. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
  1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Do not splice structural members between supports, unless otherwise indicated.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- E. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- F. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  1. Use copper naphthenate for items not continuously protected from liquid water.
- G. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  1. NES NER-272 for power-driven fasteners.
  2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

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- H. 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. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 PROTECTION

- A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

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**SECTION 075419 - POLYVINYL-CHLORIDE (PVC) ROOFING**

**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. Adhered system with Fleece backed polyvinyl-chloride (PVC) roofing system.
- 2. Roof Insulation, flat and tapered
- 3. Vapor retarder.
- 4. Deck Sheathing
- 5. Flashings

- B. Section includes the installation of insulation strips in ribs of roof deck. Insulation strips are furnished under Section 053100 "Steel Decking."

C. Related Requirements:

- 1. Section 061000- "Rough Carpentry for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
- 2. DGS-30-326 " Special Requirements for Low Slope Roofing Membranes" for State of Virginia requirements for low slope roofing including Meetings, inspections, Roof Guarantee.
- 3. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.

**1.3 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.

**1.4 PREINSTALLATION MEETINGS**

- A. See DGS-30-326 " Special Requirements for Low Slope Roofing Membranes" and CO-7 General Conditions of the Construction Contract.

**1.5 SUBMITTALS**

- A. See CO-7 General Conditions of the Construction Contract for Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's written information listed below.

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1. Product data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
2. Storage and handling requirements.
- C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- F. Warranty:
  1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
  2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.
  3. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

#### **1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing the work of this section:
  1. With minimum 5 years documented experience.
  2. Approved by membrane manufacturer.
  3. Extend manufacturer's labor and materials guarantee.
  4. Extend manufacturer's No Dollar Limit guarantee.
- B. Single Source Responsibility: Provide and install products from single source.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.

#### **1.08 PERFORMANCE REQUIREMENTS**

- A. General Performance: Installed membrane 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. Membrane roofing and base flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.



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- C. Solar Reflectance Index (SRI): Three-year-aged SRI not less than 86 or initial SRI not less than 103 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
- D. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
- E. Energy Performance: Roofing system shall have an initial solar reflectance of not less than 0.82 and not less than 0.71 after 3 years when tested according to ASTM C1549
- F. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7.
  - 1. Corner Uplift Pressure: **126.4**lbf/sq. ft.
  - 2. Perimeter Uplift Pressure: **84** lbf/sq. ft.
  - 3. Field-of-Roof Uplift Pressure: **50** lbf/sq. ft.
- G. Roof Assembly shall be Class A rated.
- H. Pass the requirements of UL1256 or NFPA 276

#### **1.09 WARRANTY**

- A. Refer to "Special Requirements for Low Slope Roofing Membranes DGS-30-326"

#### **PART 2 - PRODUCTS**

##### **2.1 PVC Membrane Roofing**

- A. PVC Sheet:
  - 1. Subject to compliance with requirements, incorporated, 60-mil thick white polyester reinforced PVC kee HP, ASTM D 4434 Type III & IV with 55-mil Fleece backing or equal as approved by Architect.

Membrane thickness over the reinforcing scrim (top-ply thickness) shall be nominal .029-mil or thicker.

- a. Membrane Weathering Performance: The PVC membrane shall be formulated with KEE HP or a minimum of 50% Elvaloy polymer to withstand:
  - 1) ASTM D 3045: 56 days exposure @ 176°F and 670 hrs @ 240° F.
  - 2) Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
  - 3) Impact resistance: Roofing system shall resist impact damage when tested

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according to ASTM D 3746 or ASTM D 4272

- 4) Puncture Resistance: Roofing system shall resist puncture damage when tested according to ASTM D 5602 or ASTM D 5635.

## **2.2 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 shall comply with the following limits for VOC content:
    - a. Plastic Foam Adhesives: 50 g/L.
    - b. Gypsum Board and Panel Adhesives: 50 g/L.
    - c. Multipurpose Construction Adhesives: 70 g/L.
    - d. Fiberglass Adhesives: 80 g/L.
    - e. Contact Adhesives: 80 g/L.
    - f. PVC Welding Compounds: 510 g/L.
    - g. Other Adhesives: 250 g/L.
    - h. Single-Ply Roof Membrane Sealants: 450 g/L.
    - i. Nonmembrane Roof Sealants: 300 g/L.
    - j. Sealant Primers for Nonporous Substrates: 250 g/L.
    - k. Sealant Primers for Porous Substrates: 775 g/L.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet.
- C. Bonding Adhesive: Manufacturer's standard Low-VOC.
- D. Slip Sheet: Manufacturer's standard, of thickness required for application.
- E. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.
- G. 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.

## **2.3 SUBSTRATE BOARDS**

- A. Glass mat faced Gypsum panels, ASTM C1177/C117M, Fire resistant type, 1/2" inch thick.

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Minimum compressive strength 900 psi.

#### **2.4 VAPOR RETARDER**

- A. Self-adhering-Sheet Vapor Retarder: ASTM D 1970, polyethylene film laminated to layer rating of 0.1 perm; cold applied, with slip-resisting surface and release backing. Provide primer when recommended by vapor-retarder manufacturer.

#### **2.5 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 2 felt or glass-fiber mat facer on both major surfaces.

#### **2.6 INSULATION ACCESSORIES**

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.
- B. Fasteners: Factory-coated steel fasteners and metal complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
  - 1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
  - 2. Full-spread spray-applied, low-rise, two-component urethane adhesive

### **PART 3 - EXECUTION**

#### **3.1 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 053100 "Steel Decking."
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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#### **3.2 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.

#### **3.3 ROOFING INSTALLATION, GENERAL**

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

#### **3.4 VAPOR-RETARDER INSTALLATION**

- A. Self-Adhering-Sheet Vapor Retarder: Prime substrate if required by manufacturer. Install self-adhering-sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 inches (90 mm) and 6 inches (150 mm), respectively. Seal laps by rolling.
- B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

#### **3.5 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 tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

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- F. 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 (6 mm) with insulation.
  - 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- G. Adhered Insulation: Install each layer of insulation over the base layer as follows:
  - 1. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place. Weigh down boards until adhesive is set.
- H. Mechanically Fastened Insulation: Install base layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
  - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
- I. 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 (150 mm) in each direction. Loosely butt cover boards together
  - 1. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place. Weigh down boards until adhesive is set.

### **3.6 ADHERED 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 retaining.
  - 1. Install sheet according to ASTM D 5036.
- 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

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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.
- H. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

**3.7 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

**3.8 WALKWAY INSTALLATION**

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

**3.9 FIELD QUALITY CONTROL**

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

**3.10 CLEANING**

- A. Remove Wrappings, empty containers, paper, and other debris from the roof daily. Dispose of debris in compliance with local, state, and federal regulations.

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B. Repair or replace defaced or damaged finishes caused by work of this section.

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SECTION 076200 - SHEET METAL FLASHING AND TRIM

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. Formed Products:

- a. Formed low-slope roof sheet metal fabrications.

B. Related Sections:

- 1. Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking.
- 2. Division 07 Section "Roof Specialties" for manufactured roof specialties not part of sheet metal flashing and trim.
- 3. Division 07 Section "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

- B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.

- 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.4 SUBMITTALS

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

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- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
1. Identification of material, thickness, weight, and finish for each item and location in Project.
  2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
  3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  4. Details of termination points and assemblies, including fixed points.
  5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
  6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
  7. Details of special conditions.
  8. Details of connections to adjoining work.
  9. Detail formed flashing and trim at a scale of not less than 1-1/2 inches per 12 inches (1:10).
- C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
  2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
  3. Accessories and Miscellaneous Materials: Full-size Sample.
- E. Qualification Data: For qualified fabricator.
- F. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.
- G. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

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- C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
1. Build mockup of typical roof eave, including Coping, fascia, curved edge fascia fascia trim, approximately 3 foot (3.0 m) long, including supporting construction cleats, seams, attachments and accessories.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- D. Preinstallation Conference: Conduct conference at Project site.
1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
  2. Review methods and procedures related to sheet metal flashing and trim.
  3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
  4. Review special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal flashing.
  5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.7 WARRANTY

- A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  2. Finish Warranty Period: 20 years from date of Substantial Completion.

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PART 2 - PRODUCTS

2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.
  - 1. As-Milled Finish: Mill finish.
  - 2. Surface: Smooth, flat.
  - 3. Exposed Coil-Coated Finishes:
    - a. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 4. Color: As selected by Architect from manufacturer's full range.
  - 5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).
- C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed.
  - 1. Finish: 2D (dull, cold rolled).
  - 2. Surface: Smooth, flat.

2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
  - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

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3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- C. Solder:
1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

2.3 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  2. Obtain field measurements for accurate fit before shop fabrication.
  3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
  4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- E. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

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- F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- G. Seams for Aluminum: Fabricate nonmoving seams by welding seams.
- H. Do not use graphite pencils to mark metal surfaces.

2.4 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Counterflashing: Fabricate from the following materials:
  - 1. Aluminum: 0.032 inch (0.81 mm) thick.
- B. Roof-Penetration Flashing: Fabricate from the following materials:
  - 1. Stainless Steel: 0.019 inch (0.48 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
  - 1. Verify compliance with requirements for installation tolerances of substrates.
  - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  - 1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  - 3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

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4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
  5. Install sealant tape where indicated.
  6. Torch cutting of sheet metal flashing and trim is not permitted.
  7. Do not use graphite pencils to mark metal surfaces.
- B. 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 SMACNA.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood blocking not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
- E. Seal joints as shown and as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
  2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
- F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder aluminum sheet.
  2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
  3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

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- B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant. Secure in a waterproof manner by means of interlocking folded seam or blind rivets and sealant.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.4 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.5 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200



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SECTION 077100 - ROOF SPECIALTIES

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. Roof-edge specialties.
- B. Related Requirements:
  - 1. Section 055000 "Metal Fabrications" for downspout guards and downspout boots.
  - 2. Section 076200 "Sheet Metal Flashing and Trim" for custom- and site-fabricated sheet metal flashing and trim.
  - 3. Section 079200 "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.
- C. Preinstallation Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, roofing-system testing and inspecting agency representative, roofing Installer, roofing-system manufacturer's representative, Installer, structural-support Installer, and installers whose work interfaces with or affects roof specialties, including installers of roofing materials and accessories.
  - 2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
  - 3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof specialties.
  - 1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
  - 2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.

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3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
4. Detail termination points and assemblies, including fixed points.
5. Include details of special conditions.

C. Samples: For each type of roof specialty and for each color and texture specified.

D. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

E. Samples for Verification:

1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.
2. Include roof-edge specialties made from 12-inch (300-mm) lengths of full-size components in specified material, and including fasteners, cover joints, accessories, and attachments.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Certificates: For each type of roof specialty.

C. Product Test Reports: For roof-edge flashings, for tests performed by a qualified testing agency.

D. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

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

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are SPRI ES-1 tested to specified design pressure.

B. Source Limitations: Obtain roof specialties approved by manufacturer covered by the roofing-system warranty.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

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1.8 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section SECTION 075419 - POLYVINYL-CHLORIDE (PVC) ROOFING.
- B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. FM Approvals' Listing: Manufacture and install roof-edge specialties that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-120. Identify materials with FM Approvals' markings.
- C. SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:
  - 1. Design Pressure:
    - a. Zone 2 (roof edge perimeter, vertical load direction): 84.0 pounds per square foot
    - b. Zone 3 (roof edge corners, vertical load direction): 126.4 pounds per square foot.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that

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resist rotation and avoid shear stress as a result of thermal movements. 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 (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

## 2.2 ROOF-EDGE SPECIALTIES

- A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet (3.6 m) and a continuous metal receiver with integral drip-edge cleat to engage fascia cover. Provide matching corner units.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Carlisle Syntec.
- b. Hickman Company, W. P.
- c. Metal-Era, Inc.
- d. Perimeter Systems; a division of SAF.

2. Formed Aluminum Sheet Fascia Covers: Aluminum sheet, 0.050 inch (1.27 mm) thick.

- a. Surface: Smooth, flat finish.
- b. Finish: Two-coat fluoropolymer.
- c. Color: As selected by Architect from manufacturer's full range.

3. Corners: Factory mitered and continuously welded.
4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
5. Receiver: Galvanized steel, 20 gage.
6. Special Fabrications: 45 degree inside miters.

- B. Aluminum Finish: Two-coat fluoropolymer.

1. Color: As selected by Architect from manufacturer's full range.

## 2.3 MATERIALS

- A. Aluminum Sheet: ASTM B209 (ASTM B209M), alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
- B. Aluminum Extrusions: ASTM B221 (ASTM B221M), alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:

## 2.4 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

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1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
  2. Fasteners for Copper Sheet: Copper, hardware bronze, or passivated Series 300 stainless steel.
  3. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
  4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
  5. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153/A153M or ASTM F2329.
- B. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

2.5 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Coil-Coated Aluminum Sheet Finishes:
1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - b. Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.

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- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
  2. Provide uniform, neat seams with minimum exposure of solder and sealant.
  3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
  4. Torch cutting of roof specialties is not permitted.
  5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
  2. Bed flanges in thick coat of water cut off mastic where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
1. Space movement joints at a maximum of 12 feet (3.6 m) with no joints within 18 inches (450 mm) of corners or intersections unless otherwise indicated on Drawings.
  2. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

3.3 ROOF-EDGE SPECIALITIES INSTALLATION

- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

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3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100

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SECTION 077200 - ROOF ACCESSORIES

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. This Section includes the following:

1. Roof curbs.
2. Roof hatches.
3. Roof Hatch Safety Rail
4. B Vent Flashing
5. Roof Drains

- B. Related Sections include the following:

1. Division 05 Section "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
2. Division 05 Section "Pipe and Tube Railings" for safety railing system not attached to roof hatch curbs.
3. Division 06 Section "Rough Carpentry" for roof sheathing, wood cants, and wood nailers
4. Division 07 low-slope roofing Sections for roofing accessories.
5. Division 07 Section "Sheet Metal Flashing and Trim" for shop- and field-fabricated metal flashing and counterflashing, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details for roof accessories. Show layouts of roof accessories including plans and elevations. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed factory-applied color finish required and for each type of roof accessory indicated, prepared on Samples of size to adequately show color.
- D. Warranty: Special warranty specified in this Section.

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1.4 QUALITY ASSURANCE

- A. Sheet Metal Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Pack, handle, and ship roof accessories properly labeled in heavy-duty packaging to prevent damage.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify required openings for each type of roof accessory by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
  - 1. With Architect's approval, adjust location of roof accessories that would interrupt roof drainage routes.

1.8 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

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PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers listed in other Part 2 articles.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers listed in other Part 2 articles.

2.2 METAL MATERIALS

- A. Galvanized Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coated.
- B. Aluminum Extrusions and Tubes: ASTM B 221 (ASTM B 221M), alloy and temper recommended by manufacturer for type of use, mill finished.
- C. Stainless-Steel Shapes or Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304 or Type 316, No. 2D finish.
- D. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized to comply with ASTM A 123/A 123M, unless otherwise indicated.
- E. Galvanized Steel Tube: ASTM A 500, round tube, hot-dip galvanized to comply with ASTM A 123/A 123M.
- F. Galvanized Steel Pipe: ASTM A 53/A 53M.

2.3 MISCELLANEOUS MATERIALS

- A. Security Grilles: 3/4-inch- (19-mm-) diameter, ASTM A 1011/A 1011M steel bars spaced 6 inches (150 mm) o.c. in 1 direction and 12 inches (300 mm) o.c. in the other.
  - 1. Factory Finishing:
    - a. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
    - b. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment.
    - c. Shop Primer: Manufacturer's or fabricator's standard, fast-curing, lead- and chromate-free, universal primer; selected for resistance to normal atmospheric corrosion, for compatibility with substrate and field-applied finish paint system indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

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- B. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by roof accessory manufacturer. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.
- C. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.
- D. Elastomeric Sealant: ASTM C 920, polyurethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

2.4 ROOF CURBS

- A. Roof Curbs: Provide metal roof curbs, internally reinforced and capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Fabricate with welded or sealed mechanical corner joints, with integral formed mounting flange at perimeter bottom. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
  - 1. Available Manufacturers:
    - a. Colony Custom Curbs.
    - b. Commodity Products Company, Inc.
    - c. Conn-Fab Sales, Inc.
    - d. Curbs Plus Inc.
    - e. Custom Curb, Inc.
    - f. LM Curbs.
    - g. Loren Cook Company.
    - h. Metallic Products Corporation.
    - i. Pate Company (The).
    - j. Roof Products & Systems Corporation.
    - k. Roof Products, Inc.
    - l. ThyCurb; Div. of Thybar Corporation.
    - m. Uni-Curb, Inc.
    - n. Vent Products Company, Inc.
  - 2. Material: Galvanized steel sheet, 18 gage thick.
  - 3. Liner: Same material as curb, of manufacturer's standard thickness and finish.
  - 4. Factory install wood nailers at tops of curbs.
  - 5. Factory insulate curbs with 1-1/2-inch- (38-mm-) thick, glass-fiber board insulation.
  - 6. Curb height may be determined by adding thickness of roof insulation and minimum base flashing height recommended by roofing membrane manufacturer. Fabricate units to minimum height of 12 inches (300 mm), unless otherwise indicated.
  - 7. Sloping Roofs: Where slope of roof deck exceeds 1:48, fabricate curb units with water diverter or cricket and with height tapered to match slope to level tops of units.

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2.5 ROOF HATCHES

- A. Roof Hatches: Fabricate roof hatches with insulated double-wall lids and insulated double-wall curb frame with integral deck mounting flange and lid frame counterflashing. Fabricate with welded or mechanically fastened and sealed corner joints. Provide continuous weathertight perimeter gasketing and equip with corrosion-resistant or hot-dip galvanized hardware.
1. Manufacturers:
    - a. Babcock-Davis; a Cierra Products Inc. Company.
    - b. Bilco Company (The).
    - c. Custom Curb, Inc.
    - d. Dur-Red Products.
    - e. J. L. Industries, Inc.
    - f. Milcor Inc.; a Gibraltar Company.
    - g. Nystrom, Inc.
    - h. ThyCurb; Div of Thybar Corporation.
  2. Loads: Fabricate roof hatches to withstand 40-lbf/sq. ft. (1.9-kPa) external and 20-lbf/sq. ft. (0.95-kPa) internal loads.
  3. Type and Size: Single-leaf lid, 30 by 36 inches (750 by 900 mm).
  4. Curb and Lid Material: Aluminum-zinc alloy-coated steel sheet, 0.079 inch (2.0 mm) thick.
  5. Curb and Lid Material: Aluminum sheet, 0.090 inch (2.28 mm) thick.
  6. Insulation: Polyisocyanurate board.
  7. Interior Lid Liner: Manufacturer's standard metal liner of same material and finish as outer metal lid.
  8. Exterior Curb Liner: Manufacturer's standard metal liner of same material and finish as metal curb.
  9. Fabricate units to minimum height of 12 inches (300 mm), unless otherwise indicated.
  10. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate hatch curbs with height tapered to match slope to level tops of units.
  11. Hardware: Stainless-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
    - a. Provide 2-point latch on covers larger than 84 inches (2130 mm).
    - b. Provide remote-control operation.

2.6 ROOF HATCH SAFETY RAIL

- A. Roof Hatch Fall Protection Safety Rail System and Ladder Extension by SafePro L.P. Model SP-3036
- B. Materials: Mounting System: Integrated stanchions, no fittings. Mounting holes predrilled for 3/8" diameter through bolts. Rail is mounted to extended cap flashing holes per manufacturer Installation Instructions.
- C. Tubing: 1 ½" OD .083 wall hot-rolled electric welded (HREW) steel.

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- D. Finish: Factory finished with powder coating.
  - 1. Powder Coat Finish: Manufacturer's standard super durable powder coating; color: Safety Yellow
- E. Gate System: Gravity self-closing, non-collapsible full wrap-around 1 ½” tubing grab hold (welded – no fittings). Heavy duty hinges with 5/8” hinge pin with built-in pinch-less gate stop and pull up full opening positioning. Wraps around forward protruding ergonomic hand grip stanchions.
- F. Back Cross Support Rail: Standard equipment 1 ½” steel tubing (HREW) smooth saddle joint bolt-on with 3/8” x 3” bolts and 3/8” tubing connector nuts. ASTM 316 SS
- G. Tube Terminal End Plugs: UV resistant Low Density Polyethylene (LDPE). Head Diameter 1.5 in; plug length 0.511 in, fits cleanly at tube ends keeping out water, pests and debris.
- H. Bolts and Washers: ASTM 316 Grade Stainless Steel hex head bolts 3/8” x 2 ½”, nylon locking hex nut, flat washers for counter flashing and outside mounting rail. Capable of mounting to flashing flange of roof hatch.

2.7 “B” VENT FLASHING

- A. Thaler MEF-4A “B” Vent flashing 12” (305 mm) high with integral deck flange and matching two piece collar; EPDM Triple Pressure Grommet Seal; .064” (1.6 mm) mill finish 1100-0T alloy aluminum; diameter to suit “B” Vent diameter; PVC coated deck flange.

2.8 SIPHONIC ROOF DRAINS (SRD)

- A. 14-9/32 inch Diameter Siphonic Roof Drain with Dura-coated ductile iron drain body, membrane flashing clamp, and low silhouette poly-dome. Complete with vandal-proof secured, Dura-coated cast iron air-restricting baffle and grate.

2.9 ROOF DRAINS (RD and OFD)

- A. ANSI A112.21.2M; provide hot-dip galvanized cast-iron or ductile-iron drains, with minimum of 12-inch diameter body, non puncturing flashing clamp device with integral gravel stop and deck clamp, and removable cast-iron or ductile-iron locking dome. Free area of dome shall be not less than two times the free area of drain outlet. Provide drain flashing ring seat flush with adjacent roof deck, and secure rigidly in place with deck clamp.

2.10 RAIN LEADER PIPING, FITTINGS AND PLASTIC SOLVENT FOR ROOF DRAINAGE SYSTEMS

- A. Polyvinyl chloride system, ASTM D 2665. Minimum size to be four inch diameter.
- B. Hangers, Supports and Anchors for Rain Leader Piping: Provide pipe suspension systems in accordance with good recognized practice to secure pipes, prevent pipe

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vibrations, maintain required elevations, provide for expansion and contraction, and to make a neat appearance.

- C. All piping systems shall have adequate hangers, supports, guides and anchors designed in accordance with the latest requirements of Manufacturers Standardization Society Documents SP-58 and SP-69. Perform accurate weight balance calculations to determine the required supporting force at each hanger and support location and the pipe weight load at each equipment connection. Hangers and supports shall be designed to support the weight of pipe, valves, fittings, insulation and the weight of the medium transported or used for testing, whichever is heavier. Ensure that the support assembly is capable of supporting the line under all operating conditions.
- D. All insulated and non-insulated suspended piping shall be supported in hangers approved equivalent to Grinnell Figure 260. Hanger shall be large enough to accommodate pipe with insulation where applicable. Insulation shall rest on sheet metal sleeve of sufficient length to prevent crushing insulation.
- E. Provide galvanized brackets and racks to support piping run adjacent to walls or steel columns.
- F. Provide auxiliary steel as required for the installation of all hangers, supports and anchors.
- G. Wire or strap hangers shall not be used.
- H. Where conditions are such that the above specified hangers are not suitable, submit for review by the Architect the types of hangers proposed.
- I. Hangers that come in contact with the pipe shall have construction to match pipe.
- J. Hanger rods shall be steel construction. Maximum loads for threaded steel hanger rods shall be in accordance with the following:
 

1. Rod Diameter (Inches)	<u>3/8</u>	<u>1/2</u>	<u>5/8</u>	<u>3/4</u>	<u>1</u>	<u>1-1/8</u>	<u>1-1/4</u>
Maximum Loads (Lbs)	610	1130	1810	2710	4960	6230	8000
- K. Insulate all rain leaders and/or roof drain piping.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of work.
  - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored and is ready to receive roof accessories.

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2. Verify dimensions of roof openings for roof accessories.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Install roof accessories to fit substrates and to result in watertight performance.
- C. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
- D. Roof Curb Installation:
  1. Set roof curb so top surface of roof curb is level.
- E. Equipment Support Installation:
  1. Set equipment support so top surface of equipment support is level.
- F. Roof Hatch Installation:
  1. Check roof hatch for proper operation. Adjust operating mechanism as required. Clean and lubricate joints and hardware.
  2. Attach safety railing system to roof hatch curb.
  3. Attach ladder safety post according to manufacturer's written instructions.
- G. B Vent Installation:
  1. Set deck flange in layer of membrane adhesive and extend single ply up sleeve to highest elevation possible and clamp membrane to flashing. Weld roofing to deck flange using PVC torch
- H. Seal joints with elastomeric sealant as required by manufacturer of roof accessories.

3.3 TOUCH UP

- A. Touch up factory-primed surfaces with compatible primer ready for field painting in accordance with Division 09 painting Sections.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.



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3.4 CLEANING

- A. Clean exposed surfaces according to manufacturer's written instructions.

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SECTION 079200 - JOINT SEALANTS

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. Urethane joint sealants.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Qualification Data: For qualified Installer and testing agency.
- E. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- F. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- H. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

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1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
  2. When joint substrates are wet.
  3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
1. Architectural Sealants: 250 g/L.
  2. Sealant Primers for Nonporous Substrates: 250 g/L.
  3. Sealant Primers for Porous Substrates: 775 g/L.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

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1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. BASF Building Systems; Sonolastic NP1.
  - b. Bostik, Inc.; Chem-Calk 900.
  - c. May National Associates, Inc.; Bondaflex PUR 25.
  - d. Pacific Polymers International, Inc.; Elasto-Thane 230 Type II.
  - e. Pecora Corporation; Dynatrol I-XL.
  - f. Sika Corporation, Construction Products Division; Sikaflex - 1a.

2.3 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
    - a. Concrete.
    - b. Masonry.

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- c. Unglazed surfaces of ceramic tile.
  - d. Exterior insulation and finish systems.
3. Remove laitance and form-release agents from concrete.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3.4 FIELD QUALITY CONTROL

- A. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

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- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

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SECTION 099600 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes surface preparation and the application of high-performance coating systems on the following substrates:
  - 1. Interior Substrates:
    - a. Galvanized metal.
    - b. Previously
- B. Related Requirements:
  - 1. Section 055000 - Metal Fabrications

1.3 DEFINITIONS

- A. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees, according to ASTM D523.
- C. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.
- D. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
  - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
  - 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product indicated.
- C. Samples for Verification: For each type of coating system and each color and gloss of topcoat indicated.
  - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.

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2. Apply coats on Samples in steps to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Coatings: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each coating system indicated to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each coating system.
  - a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
  - b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
  - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

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1.8 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior coatings in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. PPG Paints.
  - 2. Sherwin-Williams Company (The).
  - 3. Tnemec Inc.
  - 4. AkzoNobel
- B. Products: Subject to compliance with requirements, provide product listed in the Exterior High-Performance Coating Schedule or Interior High-Performance Coating Schedule for the coating category indicated or product of equivalent specification.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
  - 3. Products shall be of same manufacturer for each coat in a coating system.
- C. Colors: As selected by Architect from manufacturer's full range.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Coating Materials: Owner reserves the right to invoke the following procedure:

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1. Owner will engage the services of a qualified testing agency to sample coating materials. Contractor will be notified in advance and may be present when samples are taken. If coating materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
  1. Application of coating indicates acceptance of surfaces and conditions.

**3.2 PREPARATION**

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.
- D. Painted Steel Substrates: Remove rust, loose mill scale, and loose paint. Clean using methods recommended in writing by paint manufacturer but not less than the following:

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1. SSPC-SP 1 must be performed prior to SSPC-SP 3

E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied coatings.

3.3 APPLICATION

A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for coating and substrate indicated.
2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

C. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.

1. Contractor shall touch up and restore coated surfaces damaged by testing.
2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

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- C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 EXTERIOR HIGH-PERFORMANCE COATING SCHEDULE

- A. Clean all surface with “Etch and Clean” from Great Lakes Laboratories
- B. Galvanized-Metal Substrates:
  - 1. Pigmented Polyurethane over Epoxy Primer System MPI EXT 5.3L:
    - a. Prime Coat: Primer, epoxy, anti-corrosive, for metal, MPI #101.
      - 1) Sherwin-Williams; Dura-Plate 235 Multi-Purpose Epoxy.
    - b. Intermediate Coat: Polyurethane, two component, pigmented, gloss matching topcoat.
    - c. Topcoat: Polyurethane, two component, pigmented, gloss (MPI Gloss Level 6), MPI #72.
      - 1) AkzoNobel; DEVTHANE 379 Aliphatic Urethane Gloss Enamel.
      - 2) PPG Architectural; Pitthane Ultra Gloss Urethane Enamel.
      - 3) Sherwin-Williams; Acrolon 218 HS

3.7 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

- A. Clean all surface with “Etch and Clean” from Great Lakes Laboratories
- B. Painted Steel Substrates:
  - 1. Base Coat: UNI-BOND DF SERIES 115.
  - 2. Topcoat: UNI-BOND DF SERIES 115.
- C. Galvanized-Metal Substrates:
  - 1. Base Coat: UNI-BOND DF SERIES 115.
  - 2. Topcoat: UNI-BOND DF SERIES 115.

END OF SECTION 099600