



CONSTRUCTION PERMIT APPLICATION

Applicant Completes: Sections I, II, III (optional), IV, VI, and VII

48-002415

I. IDENTIFICATION

1. Proposed Work Site at: Veterans Memorial Middle School

2. Name of Owner in Fee: Township of Brick Board of Education
Tel. (732) 785-3000 e-mail wkolibas@brickschools.org
Address 101 Hendrickson Ave. Brick, NJ 08724

3. Ownership in Fee: Public Private

4. Principal Contractor: EACM Corp Tel. (732) 842-4777
Address 1070 Ocean Ave e-mail _____
Sea Bright, NJ 07760

License No. OR, if new home, Builder Reg. No. 19HC00336200 Exp. Date 06/06/2020
Home Improvement Contractor Registration No. or Exemption Reason 46801
Federal Emp. ID No. 204549931 FAX: (732) 842-4744

5. Architect or Engineer Netta Architects Contact George Tortora
Address 1084 Rte. 22 W., Mountainside, NJ 070 e-mail gtortora@nettaarchitects
Tel. (973) 379-0006 FAX: (973) 379-1061

6. Responsible Person in Charge once Work has Begun Stephen Cashmore
Tel. (908) 915-5225 FAX: (732) 842-4744

V. FEE SUMMARY (for office use only)

	Update	Update
1. Building	\$ 0-	
2. Electrical	\$ 0-	
3. Plumbing	\$ 0-	
4. Fire Protection		
5. Elevator Devices		
6. Subtotal		
7. Less 20% for State Plan Review		
8. Subtotal		
9. State Permit Surcharge Fee		
10. Subtotal		
11. Cert. of Occupancy		
12. Other		
13. TOTAL	\$	

VI. BUILDING/SITE CHARACTERISTICS

1. Number of Stories		(office use only)
2. Height of Structure	ft.	
3. Area — Largest Floor	sq. ft.	
4. New Building Area	sq. ft.	
5. Volume of New Structure	cu. ft.	
6. Max. Live Load		
7. Max. Occupancy Load		
8. If Industrialized Building: State Approved	<u>HUP</u>	
9. Total Land Area Disturbed	sq. ft.	
10. Flood Hazard Zone		
11. Base Flood Elevation	ft.	
12. Wetlands	yes _____ no _____	

IIa. PROPOSED WORK

- ☐ Minor Work ☐ New Building ☐ Addition ☐ Demolition
- ☐ Repair ☐ Alteration ☐ Renovation ☐ Reconstruction
- ☐ Asbestos Abat. -Subch. 8 ☐ Lead Hazard Abatement ☐ Radon Remediation ☐ Annual Permit

IIb. SUBCODES

(Check all that apply)

- ☐ Building
- ☒ Electrical
- ☐ Plumbing
- ☐ Fire Protection
- ☐ Elevator

FOR OFFICE USE ONLY (Optional)

Est. Cost	Plans Rec'd by	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates Approval	Rejection	Re-viewer
	<u>mfr</u>	<u>6/26/18</u>		<u>7/25/18</u>	<u>KCB</u>			
				<u>7/2/18</u>	<u>PS</u>			
				<u>7-26-18</u>	<u>AK</u>			
			<u>7/13</u>	<u>7/13</u>	<u>PS</u>			<u>20</u>

TOTAL COST \$0

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL (primary use)

1. State Specific Use: _____
2. Use Group, Proposed: Select Group
3. Change in Use Group, Indicate Present: Select Group
4. No. of dwelling units: Total Units Income-restricted
- | | |
|----------------|--|
| Gained, Sale | |
| Gained, Rental | |
| Lost, Sale | |
| Lost, Rental | |

B. NON-RESIDENTIAL (primary use)

1. State Specific Use: _____
2. Use Group, Proposed: Select Group Select Group
3. Change in Use Group, Indicate Present: _____
- C. MIXED USE -List secondary use(s): _____
- D. Construct. Classification: Present Proposed

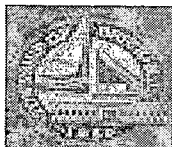
III. PLAN REVIEW (optional)

DO YOU WANT:

1. ☐ Partial Releases
2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

- | | | | |
|---|---|---|---|
| 1. ☐ Elevators/Escalators/Lifts/
Dumbwaiters/Moving Walks | 4. ☐ Refrigeration Systems | 8. ☐ Smoke Control Systems in Open Wells | 12. ☐ Fire Alarm |
| 2. ☐ High Pressure Boilers | 5. ☐ Cross-Connections/Backflow Preventers | 9. ☐ Underground Storage Tanks | |
| 3. ☐ Pressure Vessels | 6. ☐ Hazardous Uses/Places of Assembly | 10. ☐ Swimming Pools, Spas and Hot Tubs | |
| | 7. ☐ Sprinklers/Standpipes | 11. ☐ LPGas Tanks | |



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723

Date Issued 1/31/2019
Control Number C-18-002415
Permit Number 18-2206
Permit Issue Date 8/13/2018
Certificate Number 18-2206

Certificate

Construction Code Division

(Certificate of Approval)

Identification

Work Site Location: 105 HENDRICKSON AVE VMMS Brick Township, NJ Block: 1068 Lot: 15.01 Qual: _____
Owner in Fee: BRICK TOWNSHIP BOARD OF EDUCATION
Owner Address: 101 HENDRICKSON AVE. BRICK NJ 08724
Telephone: _____
Contractor: EACM CORP
Address: 1070 OCEAN AVE SEA BRIGHT NJ 07760
Telephone: (732) 842-4777 Fax: (732) 842-4744
License Number or Builders Registration Number: _____ Federal Emp. Number: 20-4549931

Home Warranty Number: _____

Type of Warranty Plan: ☐ State ☐ Private

Use Group: E Construction Classification: _____

Maximum Live Load: 0 Maximum Occupancy Load: 0

Description of Work/Use: HVAC - - VETERANS MEMORIAL MIDDLE SCHOOL

Certificate Comments:

☐ **Certificate of Occupancy**

This serves notice that said building or structure has been constructed in accordance with the New Jersey Uniform Construction Code and is approved for occupancy.

☒ **Certificate of Approval**

This serves notice that the work completed has been constructed or installed in accordance with the New Jersey Uniform Construction Code and is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection.

☐ **Certificate of Continued Occupancy**

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

☐ **Temporary Certificate of Compliance**

The following conditions must be met no later than or the owner will be subject to fine or order to vacate:

This certificate has an expiration date of:

Conditions to be met:

☐ **Certificate of Clearance - Lead Abatement 5:17**

This serves notice that based on written certification, lead abatement was performed as per NJAC5:17 to the following extent.

- ☐ Total removal of lead-based paint hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Clearance - Asbestos Abatement**

This serves notice that based on written certification, asbestos abatement was performed to the following extent.

- ☐ Total removal of asbestos hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Compliance**

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until

☐ **Temporary Certificate of Occupancy**

The following conditions must be met no later than: or the owner will be subject to fine or order to vacate:

This certificate has an expiration date of:

Conditions to be met:

Construction Official

Date Printed: 1/31/2019

U.C.C. F260 (rev. 08/05)

Fee: \$0.00

Check Number: _____

Collected By: _____

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. ☐ I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

- B. ☐ I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(f)1.ix:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

- C. ☐ I further certify that I will perform or supervise the following work:

C.1. ☐ Building C.2. ☐ Fire Protection

I further certify that I will perform the following work:

C.3. ☐ Electrical C.4. ☐ Plumbing

- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals, including such certification as the construction official may require, have been given or will be given prior to permit issuance.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals, including such certification as the construction official may require, have been given or will be given prior to permit issuance.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

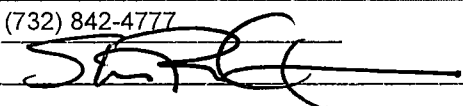
I understand that if any of the above statements are willfully false, I am subject to punishment.

☐ Check if contractor.

Agent Name EACM Corp.

Address 1070 Ocean Ave.
Sea Bright, NJ 07760

Telephone (732) 842-4777

Signature 

- III. ☐ LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:23-2.15(b)4.

- IV. ☐ HOME ELEVATION: Include Home Elevation Contractor Certification as per N.J.S.A. 52:27D-123.16.

Above Auditorium



FIRE PROTECTION SUBCODE TECHNICAL SECTION



A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 15-01 1068 Lot 1068 15-01 Qualification Code _____

Work Site Location Veterans Memorial Middle School

105 Hendrickson Avenue, Brick, NJ 08724

Owner in Fee: Brick Township Board of Education

Tel. (732) 785-3000 e-mail _____

Address 101 Hendrickson Avenue Brick, NJ 08724

Contractor: TZ Electrical Contracting, LLC municipality _____ Tel. (973) 948-0260

Address 22 Sunrise Trail e-mail sw@tzelectric.net

Branchville, NJ 07826

Fire Protection Equipment, NJ Div of Fire Safety Permit No. _____

Fire Protection Equipment, NJ Div of Fire Safety Installer No. _____

Fire Alarm Contractor No. 11762 Exp. Date 03/31/2021

Home Improvement Contractor Registration No. or Exemption Reason _____

Federal Emp. ID No. 45-252628 FAX: (973) 948-0263

B. FIRE PROTECTION CHARACTERISTICS

Use Group: Present _____ Proposed _____

Constr. Class: Present _____ Proposed _____

Heating System: ☐ New OR ☐ Modification to Existing
OR ☐ Conversion OR ☐ Replacement

Fuel Type: ☐ Gas ☐ Oil ☐ Electric ☐ Solar
☐ Other _____

Location: _____

Total Cost of Fire Protection Work \$ 2,800

Fuel Storage Tank:

Fuel Type: ☐ Flammable OR ☐ Combustible
Capacity _____

Fire Alarm System: ☐ New OR ☒ Existing

Location of Panel: _____

Fire Suppression/Standpipe System:

☐ New OR ☐ Existing

Location of Main Control Valve: _____

JOB SUMMARY (Office Use Only)		INSPECTIONS		Dates (Month/Day)	
PLAN REVIEW		Type:	Failure	Failure	Approval Initial
☐ No Plans Required		Alarm System			
☐ Partial - Underslab Utilities Approved		Suppression Sys.			
Date: _____ Approved by: _____		Standpipe			
☒ Fire Protection Plans Approved		Fire-Pump			
Date: <u>8-13-18</u> Approved by: <u>[Signature]</u>		Pre-Eng. System			
Joint Plan Review Required:		Mechanical			
☐ Bldg. ☐ Elec. ☐ Plumb. ☐ Elev.		Smoke Control			
SUBCODE APPROVAL for PERMIT		TCO			
Date: <u>8-9-18</u>		Flam/Combust Tanks			
Approved by: <u>[Signature]</u>		Fireplace Venting			
SUBCODE APPROVAL for CERTIFICATE		Final	<u>3-27-18</u>		<u>[Signature]</u>
☐ CO ☐ CCG ☐ CA		Other			
Date: <u>1-2-18</u>					
Approved by: <u>[Signature]</u>					

U.C.C. F140 (rev. 02/11)
Internet version

Applicant: When submitting this form to your Local Construction Code Enforcement Office, please provide one original plus three photocopies.

See back

Date Received
Control #

Date Issued
Permit #

8/13/18
18-2206

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the legal owner of record and am authorized to make this application.

Applicant/Owner/Agent sign here: Steven Woodhead

Print name here: Steven Woodhead

D. TECHNICAL SITE DATA

☒ Certified Contractor ☐ Exempt Applicant

DESCRIPTION OF WORK:

Water Supply Source Install 2 duct detectors

Method of Alarm/Suppression System Supervision _____

	NUMBER	FEE (Office Use Only)
Flammable/Combustible Tanks		\$
Alarm Systems		
☐ System		
☐ 110v Interconnected		
☐ CO Detectors/110v		
Alarm Devices (i.e., smoke, heat, pulls, water/flow)	<u>2</u>	
Supervisory Devices (i.e., tampers, low/high air)		
Signaling Devices (i.e., horn/strobes, bells)		
Other Devices		
TOTAL	<u>2</u>	
Suppression Systems		
Fire Pump _____ GPM Type _____		
Dry Pipe/Alarm Valves		
Pre-action Valves		
Sprinkler Heads (Dry and Wet)		
Standpipes		
Pre-engineered Systems		
Wet Chemical		
Dry Chemical		
CO ₂ Suppression		
Foam Suppression		
FM200 Suppression		
Other		
Other Systems		
Kitchen Hood Exhaust System		
Smoke Control System		
Fuel-Fired Appliances ☒ Gas ☐ Oil ☐ Solid		
Fireplace Venting/Metal Chimney		
Other		

As per plan - to be re-connected to FA System
*Carbon Monoxide Alarms req.
See attached letter

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____



ELECTRICAL SUBCODE TECHNICAL SECTION



A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 15-01 1068 Lot 10-58 15-01 Qualification Code _____

Work Site Location Veterans Memorial Middle School

105 Hendrickson Avenue, Brick, NJ 08724

Owner in Fee: Brick Township Board of Education

Tel. (732) 785-3000 e-mail _____

Address 101 Henrickson Avenue Brick, NJ 08724

Contractor: TZ Electrical Contracting, LLC Tel. (973) 948-0260

Address 22 Sunrise Trail e-mail sw@tzelectric.net

Branchville, NJ 07826

Contractor License No. 11762 Exp. Date 03/31/2021

Home Improvement Contractor Registration No. or Exemption Reason _____

Federal Emp. ID No. 452526282 FAX: (973) 948-0263

B. ELECTRICAL CHARACTERISTICS

Use Group Present _____ Proposed _____

[] Pole/Pad # _____ [] Temporary [] Other _____

Building Occupied as School Utility Co. _____

Est. Cost of Elec. Work \$ 37,800

JOB SUMMARY (Office Use Only)		INSPECTIONS		Dates (Month/Day)	
PLAN REVIEW		Type	Failure	Failure	Approval Initial
[] No Plans Required					
[] Partial - Underslab Utilities Approved		Rough			
Date: _____ Approved by: _____		Barrier-Free			
[] Electric Plans Approved		Trench			
Date: <u>2/4/18</u> Approved by: <u>PJE</u>		Temp. Serv.			
Joint Plan Review Required:		Constr. Serv.			
[] Bldg. [] Plumb. [] Fire. [] Elev.		TCO			
SUBCODE APPROVAL FOR PERMIT		Other			
Date: <u>7/2/18</u>		Service			
Approved by: <u>[Signature]</u>		Final			
SUBCODE APPROVAL FOR CERTIFICATE		Barrier-Free			
[] CO [] CCO [] CA		Temp. Cut-in-Card Date Issued			
Date: <u>10/3/18</u>		Final Cut-in-Card Date Issued			
Approved by: <u>[Signature]</u>		Annual Pool Inspection			
		Date of Grounding and Bonding Certification			

C. CERTIFICATION OF OWNER OF RECORD

I hereby certify that I am the owner of record and am authorized to make this application and perform the work listed on this application.

Applicant Signature: Steven Woodhead

Print name: Steven Woodhead

☒ Licensed Elec. Contractor [] Certified Landscape Irrigation Contr'r [] Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK:

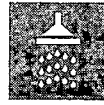
HVAC Replacement

QTY.	SIZE	ITEMS	FEE (Office Use Only)
_____	_____	Lighting Fixtures	_____
_____	_____	Receptacles	_____
_____	_____	Switches	_____
_____	_____	Detectors	_____
_____	_____	Light Poles	_____
_____	_____	Motors—Fract. HP	_____
_____	_____	Emergency & Exit Lights	_____
_____	_____	Communications Points	_____
_____	_____	Alarm Devices/F.A.C. Panel	_____
_____	_____	TOTAL NUMBER _____	_____
_____	_____	Pool Permit with SW Lights	_____
_____	_____	Storable Pool/Spa/Hot Tub	_____
_____	_____	KW Elec. Range/Receptacle	_____
_____	_____	KW Oven/Surface Unit	_____
_____	_____	KW Elec. Water Heater	_____
_____	_____	KW Elec. Dryer/Receptacle	_____
_____	_____	KW Dishwasher	_____
_____	_____	HP Garbage Disposal	_____
_____	_____	KW Central A/C Unit	_____
_____	_____	HP/KW Space Heater/Air Handler	_____
_____	_____	KW Baseboard Heat	_____
_____	_____	HP Motors 1/+ HP	_____
_____	_____	KW Transformer/Generator	_____
_____	_____	AMP Service	_____
_____	_____	AMP Subpanels	_____
_____	_____	AMP Motor Control Center	_____
_____	_____	KW Elec. Sign/Outline Light	_____

Administrative Surcharge \$ _____
 Minimum Fee \$ _____
 State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____



PLUMBING SUBCODE TECHNICAL SECTION



outside
Door #6 (skuttle to Roof)
By Gym corridor Inside

Date Received
Control #

8/13/18

Date Issued
Permit #

18-2206

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 15.01 1068 Lot 1068 15.01 Qualification Code Auditorium unit
Work Site Location Veterans Memorial Middle School
105 Hendrickson Ave., Brick, NJ 08724

Owner in Fee: Township of Brick Board of Education

Tel. (732) 785-3000 e-mail wkolibas@brickschools.org

Address 101 Hendrickson Ave. Brick, NJ 08724

Contractor: EACM Corp. Tel. (732) 842-4777

Address 1070 Ocean Ave. e-mail stephen@eacmcorp.com

Sea Bright, NJ 07760

Contractor License No. 19HC00336200 Exp. Date 06/06/2020

Home Improvement Contractor Registration No. or Exemption Reason 46801

Federal Emp. ID No. 204549931 FAX: (732) 842-4744

B. PLUMBING CHARACTERISTICS

Use Group Present Proposed

Building Sewer Size Public Sewer Private Septic

Water Service Size Public Water Private Well

Est. Cost of Plumbing Work \$ 16,250.

JOB SUMMARY (Office Use Only)		INSPECTIONS				Dates (Month/Day)	
PLAN REVIEW		Type:	Failure	Failure	Approval	Initial	
[] No Plans Required		Slab					
[] Partial Underslab Utilities Approved		Rough					
Date: <u> </u> Approved by: <u> </u>		Water					
[] Plumbing Plans Approved		Sewer					
Date: <u> </u> Approved by: <u> </u>		Fixtures					
Joint Plan Review Required:		Gas Equipment					
[] Bldg. [] Elec. [] Fire [] Elev.		Gas Piping	<u>8-30-18</u>		<u>10-2-18</u>	<u>PD</u>	
SUBCODE APPROVAL for PERMIT		LPGas Tank					
Date: <u>7-18-18</u>		Fuel Oil Piping					
Approved by: <u> </u>		Solar					
SUBCODE APPROVAL for CERTIFICATE		TCO					
[] CO [] CCO [] CA		Final	<u>8-30-18</u>		<u>10-2-18</u>	<u>PD</u>	
Date: <u>10-3-18</u>							
Approved by: <u> </u>							

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

Applicant sign/Contractor sign and seal here:

Print name here: Stephen Cashmore

[] Licensed Plumbing Contractor [x] Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK INSTALL GAS PIPING TO NEW ROOFTOP HVAC UNIT

QTY.	FIXTURE/EQUIPMENT	FEE (Office Use Only)
_____	Water Closet	\$ _____
_____	Urinal/Bidet	_____
_____	Bath Tub	_____
_____	Lavatory	_____
_____	Shower	_____
_____	Floor Drain	_____
_____	Sink	_____
_____	Dishwasher	_____
_____	Drinking Fountain	_____
_____	Washing Machine	_____
_____	Hose Bibb	_____
_____	Water Heater	_____
_____	Fuel Oil Piping	_____
_____	Gas Piping	_____
_____	LPGas Tank	_____
_____	Steam Boiler	_____
_____	Hot Water Boiler	_____
_____	Sewer Pump	_____
_____	Interceptor/Separator	_____
_____	Backflow Preventer	_____
_____	Greasetrap	_____
_____	Sewer Connection	_____
_____	Water Service Connection	_____
_____	Stacks	_____
_____	Other	_____

COMMERCIAL

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____

8/21/18 PM - All look Good Interior and Roof
Top. Just need steel cent for
New structural steel holding unit.
8/27/18 PM. Received letter steel cent. all etc

CONNECT

7
①
Feb.

Date??

MASTERCRAFT IRON INC

FABRICATORS / ERECTORS

Structural Steel - Metal Work - Stair Builders

RECEIVED
AUG 24 2018
BUILDING

Brick Township Building Department
Attn: Building Inspections
401 Chambers Bridge Rd.
Brick, NJ 08723

August 23, 2018

RE: Veterans Memorial Middle School
Permit #18-2206

We have completed the structural steel framing for the new RTU in accordance with Drawing A-102 dated 4/02/2018 and Drawing A103 dated 3/06/2018.

All welding was performed by our certified welder – Frank Martin. I have attached a copy of his welding certification.

Thank you,
Robert VanNorman
V. President

1068/15.01



CERTIFIED TESTING & INSPECTIONS, INC.

TESTING • INSPECTIONS • ENGINEERING

Welder and Welding Operator Qualification Test Record

Welder or welding operator's name Frank Martin Identification No. FM-1
Welding process SMAW Manual XX Semiautomatic Machine
Position 3G Uphill Qualification Range 1G-2G-3G
(Flat, horizontal, overhead or vertical-if vertical, state whether upward or downward)
In accordance with procedure specification no. BU 2A
Material Specification A-36 to A-36
Diameter and wall thickness (if pipe)-otherwise, joint thickness 1/2"
Thickness range this qualifies 1"

FILLER METAL

Specification no. SFA 5.1 Classification E 7018 F no. 4
Describe filler metal (if not covered by AWS specification)
Is backing strip used? Yes
Filler metal diameter and trade name 1/8" Lincoln
Flux for submerged arc or gas for gas metal arc or flux cored arc welding

VISUAL INSPECTION (9.25.1)

Appearance Satisfactory Undercut None Piping porosity None

GUIDED BEND TEST RESULTS

Type	Result	Type	Result
Side	Satisfactory		
Side	Satisfactory		

Test conducted by Certified Testing & Inspections, Inc. Laboratory test no. WO#5
Per AWS D1.1 Test date 5-10-08

FILLER TEST RESULTS

Appearance N/A Fillet size N/A
Fracture test root penetration N/A Marcoetch N/A
(Describe the location, nature, and size of any crack or tearing of the specimen.)
Test conducted by N/A Laboratory test no. N/A
Per N/A Test date N/A

RADIOGRAPHIC TEST RESULTS

Film identification	Results	Remarks	Film identification	Results	Remarks
<u>N/A</u>					
<u>N/A</u>					

Test witnessed by _____ Test no. _____
Per _____

We, the undersigned, certify that the statements in this record are correct and that the welds were prepared and tested in accordance with the requirements of 5C or D of AWS D1.1, (2000) Structural Code.

Date: 5-10-08
Manufacturer or Contractor Mastercraft Iron
Authorized by Pete Stagart



CONSTRUCTION PERMIT

Date Issued 08/13/2018
Control # C-18-002415
Permit # 18-2206

IDENTIFICATION Block: 1068 Lot: 15.01 Qualifier _____
Work Site Location: 105 HENDRICKSON AVE VMMS Brick Township, NJ Contractor EACM CORP
Address 1070 OCEAN AVE SEA BRIGHT NJ 07760
Owner in Fee BRICK TOWNSHIP BOARD OF EDUCATION
101 HENDRICKSON AVE. BRICK NJ 08724 Telephone: (732) 842-4777
Lic. No. or Bldrs. Reg. No. 19HC00336200 19HC00336200
Telephone: _____ Federal Employee No. 204549931

Is hereby granted permission to perform the following work:

- ☒ BUILDING ☒ PLUMBING ☐ LEAD HAZARD ABATEMENT
☒ ELECTRICAL ☒ FIRE PROTECTION ☐ DEMOLITION
☐ ELEVATOR DEVICES ☐ ASBESTOS ABATEMENT (Subchapter 8 only) ☐ OTHER

DESCRIPTION OF WORK:

HVAC - VETERANS MEMORIAL MIDDLE SCHOOL

Note: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work \$100,350

D. Newman Jr
Construction Official

8/13/18
Date

U.C.C. F170
equiv (rev 1/04)

1 WHITE - INSPECTOR

2 CANARY - OFFICE

3 PINK - TAX ASSESSOR

4 GOLD - APPLICANT

PAYMENTS (Office Use Only)

Building _____ \$0
Electrical _____ \$0
Plumbing _____ \$0
Fire Protection _____ \$0
Elevator Devices _____ \$0
Other _____ \$0.00
DCA Training Fee _____ \$0
CO Fee _____
Other _____ \$0
Total _____ \$0
Check No. _____
Cash _____ \$0
Credit _____ \$0
Collected By _____

REQUIRED INSPECTIONS

Construction work must be inspected in accordance with the State Uniform Construction Code Regulations N.J.A.C. 5:23-2.18. This agency will carry out such periodic inspections during the progress of work as are necessary to insure that the work installed conforms with the requirements of the Uniform Construction Code.

The owner or other responsible person in charge of work must notify this agency when work is ready for any required inspections specified below. Requests for inspections must be made at least 24 hours prior to the time the inspection is desired. Inspections will be performed within three business days of the time for which they are requested. The work must not proceed in a manner which will preclude the inspection until it has been made and approval granted.

☒ Required inspections for all subcodes for one- and two-family dwellings are as follows:

1. The bottom of footing trenches before placement of footings, except that in cases of pile foundations, inspections shall be made in accordance with the requirements of the building subcode.
2. Foundations and all walls up to grade level prior to back filling.
3. All structural framing, connections, wall and roof sheathing and insulation; electrical rough wiring, panel and service installation; rough plumbing. The framing inspection shall take place after the rough electrical and plumbing inspections and after the installation of the heating, ventilation and /or air conditioning duct system. The insulation inspection shall be performed after all other subcode rough inspections and prior to the installation of any interior finish material.
4. Installation of all finished materials, sealings of exterior joints, plumbing piping, trim and fixtures; electrical wiring, devices and fixtures; mechanical systems equipment.

Additional required inspections for all subcodes of construction, for other than one- and two-family dwellings, are fire suppression systems, heat producing devices and Barrier Free subcode accessibility, if applicable.

☐ Required special inspections. The applicant by accepting the permit will be deemed to have consented to these requirements:

☒ A final inspection is required for each applicable subcode area before a final Certificate of Occupancy or Approval may be issued. The final inspections include the installation of all interior and exterior finish materials, sealing of exterior joints, mechanical system and other required equipment; electrical wiring, devices and fixtures; plumbing pipes, trim and fixtures; tests required by any provision of the adopted subcodes, Barrier Free accessibility, if applicable; and verification of compliance with NJAC 5:23-3.5, "Posting structures".

☒ A complete copy of released plans must be kept on the job site.

If you do not understand any of this information, please ask.

THIS DOCUMENT IS PRINTED ON WATERMARKED PAPER WITH A MULTICOLORED
BACKGROUND AND MULTIPLE SECURITY FEATURES. PLEASE VERIFY AUTHENTICITY.

**State Of New Jersey
New Jersey Office of the Attorney General
Division of Consumer Affairs**

THIS IS TO CERTIFY THAT THE
Board of Exam. of HVACR Contractors

HAS LICENSED

**Stephen R. Cashmore
902 Ocean Avenue
Sea Bright NJ 07760**

FOR PRACTICE IN NEW JERSEY AS A(N): Master HVACR Contractor

05/10/2018 TO 06/30/2020

VALID


Signature of Licensee/Registrant/Certificate Holder

19HC00336200

LICENSE/REGISTRATION/CERTIFICATION #


ACTING DIRECTOR

FIRST-CLASS MAIL
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PERMIT 21

PLEASE DETACH HERE
IF YOUR LICENSE/REGISTRATION/
CERTIFICATE ID CARD IS LOST
PLEASE NOTIFY:
Board of Exam. of HVACR Contractors
P.O. Box 47031
Newark, NJ 07101

PLEASE DETACH HERE

**Veteran's Memorial Middle School
HVAC Replacement
105 Hendrickson Avenue
Brick, New Jersey 08724**

Specifications

Provided By:
EACM Corp.
1070 Ocean Avenue
Sea Bright, New Jersey 07760

Veterans
Memorial
Middle School
HVAC
Replacement

Specifications

1

Division 02 – Existing Conditions
024119 Selective Demolition

2

Division 05 – Metals
053100 Steel Decking
055000 Metal Fabrications

3

Division 06 – Wood, Plastics &
Composites
061053 Misc. Rough Carpentry

4

Division 07 – Thermal & Moisture
Protection
075216 SBS Modified Bituminous
Membrane Roofing Patching
076200 Sheet Metal Flashing & Trim
077200 Roof Accessories
079200 Joint Sealants

5

Division 09 – Finishes
099113 Exterior Painting



SECTION 024119 - SELECTIVE DEMOLITION

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. Demolition and removal of selected portions of building or structure, including but not necessarily limited to the following:
 - a. HVAC equipment, related accessories and supporting pads
 - b. Roofing as necessary to accommodate HVAC removal

B. Related Requirements:

- 1. Division 01 Section "Summary" for restrictions on the use of the premises.
- 2. Division 01 Section "Execution" for cutting and patching procedures.

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 permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 FIELD 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.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

3.3 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 level 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 until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain adequate ventilation when using cutting torches.
 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 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.
- 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, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.4 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Division 07 Section "Styren-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing" for new roofing requirements.
1. Remove existing roof membrane, flashings, copings, and roof accessories.
 2. Remove existing roofing system down to substrate.

3.5 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.
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."

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Brick, New Jersey

- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 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 for roof patching locations.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- C. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

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."

2.2 ROOF DECK

- A. 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 A 653, Structural Steel (SS), Grade 33, zinc coating.
 2. Deck Profile: To match existing.
 3. Profile Depth: To match existing.
 4. Design Uncoated-Steel Thickness: To match existing.
 5. Span Condition: To match existing.
 6. Side Laps: Overlapped.

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: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- E. Galvanizing Repair Paint: ASTM A 780.
- F. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

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.
- 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. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- H. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
 - 1. Weld Diameter: 5/8 inch, nominal.
 - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds 18 inches apart, maximum.
 - 3. Weld Washers: Install weld washers at each weld location.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 18 inches, and as follows:
 - 1. Fasten with a minimum of 1-1/2-inch-long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
 - 1. End Joints: Lapped 2 inches minimum.
- D. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- E. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.4 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

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END OF SECTION 053100

STEEL DECKING

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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 and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel framing and supports for applications where framing and supports are not specified in other Sections.

1.3 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 metal fabrications that are anchored to or that receive other work. 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.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.5 QUALITY ASSURANCE

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

1.6 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 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 ambient; 180 deg F material surfaces.

2.2 METALS

- 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.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.
- D. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.
- F. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: 1-5/8 by 1-5/8 inches or as indicated.
 - 2. Material: Galvanized steel, ASTM A 653, commercial steel, Type B, with G90 coating; 0.108-inch nominal thickness.

2.3 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Division 09 Section "Painting."
- B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.4 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 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.
 - 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 are 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.
- J. 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 with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.5 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.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.

2.6 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.7 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.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Shop prime iron and steel items unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
- C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

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.
- 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 come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

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- 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-milry 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 Section "Exterior Painting."

END OF SECTION 055000

SECTION 061053 - MISCELLANEOUS 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. Section Includes:
 - 1. Rooftop equipment bases and support curbs.
 - 2. Wood blocking, cants, and nailers.

1.3 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. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
- B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
 - 1. Preservative-treated wood.
 - 2. Fire-retardant-treated wood.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- 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.

1. Hem-fir (north); NLGA.
2. Southern pine; SPIB.
3. Douglas fir-larch; WCLIB or WWP.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
 3. Rooftop equipment bases and support curbs.
 4. Cants.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 15 percent maximum moisture content of any species.
- C. For blocking not used for attachment of other construction Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. 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.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NBR-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1.
- G. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- H. 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.

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1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- thickness.
- D. 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.
- E. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 1. Use inorganic boron for items that are continuously protected from liquid water.
 2. Use copper naphthenate for items not continuously protected from liquid water.
- F. Securely attach 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.
 3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's Uniform Building Code.
- G. 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.

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3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

END OF SECTION 061053

SECTION 075216 - SBS MODIFIED BITUMINOUS MEMBRANE ROOFING PATCHING

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. Patching of existing styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.
- 2. Cover board.
- 3. Roof insulation.

- B. Section includes the installation of insulation strips in ribs of acoustical roof deck. Insulation strips are furnished under Division 05 Section "Steel Decking."

C. Related Requirements:

- 1. Division 01 Section "Execution" for existing roof warranty.
- 2. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
- 3. Division 07 Section "Sheet Metal Flashing" for custom- and site-fabricated sheet metal flashing.
- 4. Division 07 Section "Roof Accessories" for rooftop equipment curbs.
- 5. Division 07 Section "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing patching system. Include location plan and patching details. Provide drawings showing roof deck and fastening spacings and patterns for mechanically fastened components, including:
 - 1. Base flashings and membrane terminations.
 - 2. Crickets, saddles, and tapered edge strips, including slopes.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For components of membrane roofing system, for tests performed by manufacturer and witnessed by a qualified testing agency.
- B. Sample Warranties: For manufacturer's warranties related to patching of existing roof.

- B. **Manufacturer's Warranty:** Manufacturer's standard or customized form in which manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within warranty period as designated by manufacturer. Failure includes roof leaks.
 - 1. Manufacturer's warranty includes roofing membrane, base flashings, fasteners, roofing membrane accessories and other components of roofing system specified in this Section.
- C. **Installer's Warranty:** Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders and roof walkway products, for the following warranty period:
 - 1. **Warranty Period:** Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Basis of Design Manufacturers:** The Basis of Design manufacturer of roofing products is Tremco, Inc. Subject to compliance with requirements, provide products by the Basis of Design manufacturer or approved equal.
- B. **Source Limitations:** Obtain components including roof insulation fasteners for roofing system from manufacturer to include in warranty.

2.2 PERFORMANCE REQUIREMENTS

- A. **General Performance:** Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
 - 1. **Accelerated Weathering:** Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
 - 2. **Impact Resistance:** Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- B. **Material Compatibility:** Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. **Roofing System Design:** Tested by a qualified testing agency to resist the uplift pressures as shown on the Drawings.
- D. **Solar Reflectance Index:** Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
- E. **Exterior Fire-Test Exposure:** ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.3 ROOFING SHEET MATERIALS

- A. Roofing Membrane Base-Ply Sheets: ASTM D 4601 Type II non-perforated SBS-modified asphalt coated fiberglass/fiberglass/ polyester reinforced high tensile strength sheet dusted with fine mineral surfacing on both sides.

1. Basis of Design Product: Tremco, BURmastic Composite Ply HT.
2. Product Characteristics:
 - a. Tensile Strength, minimum, ASTM D 5147: Machine direction, 165 lbf/in; Cross machine direction, 150 lbf/in.
 - b. Tear Strength, minimum, ASTM D 5147: Machine direction, 210 lbf; Cross machine direction, 185 lbf.
 - c. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 5147: 6 percent.
 - d. Thickness, minimum, ASTM D 146: 0.055 inch.

- B. Smooth-Surfaced Roofing Cap Sheet: ASTM D 6162 Type III Grade G SBS/SEBS-modified asphalt-coated composite polyester and glass-fiber-reinforced sheet, granular surfaced:

1. Basis of Design Product: Tremco, POWERply 300 FR.
2. Product Characteristics:
 - a. Exterior Fire-Test Exposure, ASTM E 108: Class A.
 - b. Tensile Strength at 73 deg. F, minimum, ASTM D 5147: Machine direction 345 lbf/in. Cross machine direction 340 lbf/in.
 - c. Tear Strength at 73 deg. F, minimum, ASTM D 5147: Machine direction, 600 lbf. Cross machine direction 580 lbf.
 - d. Elongation at 73 deg. F, minimum, ASTM D 5147: Machine direction 12.0 percent; Cross machine direction 8.0 percent.
 - e. Low Temperature Flex, maximum, ASTM D 5147: -35 deg. F.
 - f. Thickness, minimum, ASTM D 5147: 0.138 inch.

2.4 BASE FLASHING SHEET MATERIALS

- A. Backer Sheet: ASTM D 4601, Type II, asphalt-impregnated and -coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides.

1. Basis of Design Product: BURmastic Supreme Composite Ply.
2. Product Characteristics:
 - a. Tensile Strength, minimum, ASTM D 5147: Machine direction, 300 lbf/in; cross machine direction, 290 lbf/in.
 - b. Tear Strength, minimum, ASTM D 5147: Machine direction, 540 lbf; cross machine direction, 550 lbf.
 - c. Elongation at 77 deg. F, minimum, ASTM D 5147: 7 percent.
 - d. Thickness, minimum, ASTM D 146: 0.067 inch.

- B. Granule-Surfaced Flashing Sheet: ASTM D 6162 Type III, Grade G SBS/SEBS-modified asphalt-coated composite polyester and glass-fiber-reinforced sheet, granular surfaced

1. Basis of Design Product: Tremco, POWERply 300 FR.
 2. Product Characteristics:
 - a. Exterior Fire-Test Exposure, ASTM E 108: Class A.
 - b. Tensile Strength at 73 deg. F, minimum, ASTM D 5147: Machine direction 345 lbf/in ; Cross machine direction 340 lbf/in).
 - c. Tear Strength at 73 deg. F, minimum, ASTM D 5147: Machine direction, 600 lbf; Cross machine direction 580 lbf.
 - d. Elongation at 73 deg. F, minimum, ASTM D 5147: Machine direction 12.0 percent; Cross machine direction 8.0 percent.
 - e. Low Temperature Flex, maximum, ASTM D 5147: -35 deg. F.
 - f. Thickness, minimum, ASTM D 5147: 0.138 inch.
- C. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.
1. Basis of Design Product: Tremco, BURmesh.
- 2.5 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.
- B. Adhesive: Cold-applied rubberized roofing adhesive, one-part SEBS-modified, formulated for compatibility and use with specified roofing membranes and flashings.
1. Basis of Design Product: Tremco, POWERply Rubberized Cold Adhesive.
 2. Product Characteristics:
 - a. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.
 - b. Nonvolatile Content, minimum, ASTM D 6511: 70 percent.
 - c. Flash Point, minimum, ASTM D 93: 100 deg F.
- C. Asphalt Primer: Asphalt primer, water-based, polymer modified.
1. Basis of Design Product: Tremco, TREMPprime WB.
 2. Product Characteristics:
 - a. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 2 g/L.
- D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- E. Mastic Sealant: Polyisobutylene, nonhardening, nonmigrating, nonskinning, and nondrying.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- G. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

2.6 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by 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 (20 psi) with felt or glass-fiber mat facer on both major surfaces.
 - 1. Provide insulation package with minimum R Value: minimum required by applicable code.
 - 2. Double layers of 2.6 inch flat stock.
- C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.7 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 or plastic plates 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: Cold fluid-applied bead-applied low-rise adhesive, two-component solvent-free low odor elastomeric urethane, formulated to adhere roof insulation to substrate.
 - 1. Basis of Design Product: Tremco, Low Rise Foam Insulation Adhesive.
 - 2. Product Characteristics:
 - a. Flame Spread Index, ASTM E 84: 10.
 - b. Smoke Developed Index, ASTM E 84: 30.
 - c. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 0 g/L.
 - d. Tensile Strength, minimum, ASTM D 412: 250 psi.
 - e. Peel Adhesion, minimum, ASTM D 903: 17 lbf/in.
 - f. Flexibility, 70 deg. F, ASTM D 816: Pass.
- D. Insulation Cant Strips and Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

2.8 FLASHING SURFACING MATERIALS

- A. Cold-Applied Reflective Aluminum Roof Coating: ASTM D 2824 Type III metallic-pigmented, fibrated asphalt-based roof coating.
 - 1. Basis of Design Product: Tremco, Alumanation 301.
 - a. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 400 g/L.
 - b. Reflectance, minimum, ASTM D 1549: 65 percent.
 - c. Solids, percent by volume: 46.

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 cants, 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 Division 05 Section "Steel Decking."
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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.
- C. Install insulation strips in ribs of acoustical roof decks according to acoustical roof deck manufacturer's written instructions.

3.3 INSTALLATION, GENERAL

- A. Comply with roofing system manufacturer's written instructions.

3.4 INSULATION INSTALLATION

- A. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing system with vertical surfaces or angle changes greater than 45 degrees.
- B. Install insulation with long joints of insulation in a continuous straight line, with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
 - 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 5.5 inches in each direction.
 - 1. Install insulation at average overall thickness of 5.5 inches.
- D. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- E. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

- F. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 - 1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
 - 2. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
- G. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together. Tape joints if required by roofing system manufacturer.
 - 1. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining cover in place.

3.5 COLD-APPLIED ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Deck Type: Metal deck.
- B. Number of Smooth-Surfaced SBS-Modified Asphalt Sheets: Two.
 - 1. Adhering Method: Cold-adhesive applied.
- C. Granular-Surfaced SBS-Modified Asphalt Cap Sheet:
 - 1. Adhering Method: Cold-adhesive applied.
- D. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- E. Cooperate with testing agencies engaged or required to perform services for installing roofing system.
- F. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work configured as recommended by NRCA Roofing Manual Appendix: Quality Control Guidelines - Insulation to protect new and existing roofing.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 - 3. Remove temporary plugs from roof drains at end of each day.
 - 4. Remove and discard temporary seals before beginning work on adjoining roofing.
- G. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

- A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond eaves, installing as follows:
 - 1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer. 18 foot – 20 foot lengths and allow to relax.

2. Embed each ply sheet in cold-applied membrane adhesive applied at rate required by roofing manufacturer.
- B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Install roofing membrane sheets so side and end laps shed water. Completely bond and seal laps, leaving no voids.
1. Repair tears and voids in laps and lapped seams not completely sealed.
 2. Apply roofing granules to cover exuded bead at laps.
- 3.7 FLASHING AND STRIPPING INSTALLATION
- A. Base Flashing Installation, General: Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions, and as follows:
1. Extend base flashing up walls or parapets a minimum of 12 inches above built-up roofing and 6 inches onto field of built-up roofing.
 2. Prime substrates with primer if required by roofing system manufacturer.
- B. Backer Sheet Installation: Apply backer sheet to substrate as follows:
1. Adhere backer sheet to substrate in cold-applied flashing sheet adhesive.
- C. Flashing Sheet Installation: Adhere flashing sheet to substrate in cold-applied adhesive. Apply cold-applied flashing sheet adhesive to back of flashing sheet if recommended by roofing manufacturer.
1. Flashing Sheet Top Termination: Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
 - a. Seal top termination of base flashing with a metal termination bar.
 2. Flashing Sheet Bottom Termination: Adhere flashing sheet to roofing membrane in continuous bed of cold-applied adhesive.
 - a. Elastomeric Flashing Sheet: Heat weld vertical flashing joints. Seal bottom termination of base flashing by adhering to roofing membrane with cold-applied adhesive and sealing flashing-to-membrane joint with joint sealant.
- D. Metal Flashing Stripping: Install roofing membrane cap sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.
- 3.8 FLASHING SURFACING AND COATING INSTALLATION
- A. Aluminum Coating over Cold-Applied Surfacing: Coat roofing membrane surface with cold-applied adhesive surfacing adhesive applied at rate required by roofing manufacturer.
1. Aluminum Coating: Apply coating to base flashings in not less than two coats, with number of coats, thickness of application, and application method as recommended in writing by coating manufacturer.

3.9 FIELD QUALITY CONTROL

- A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.
- B. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of three full-time days per week on site to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation at commencement and upon completion.
 - 1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
- D. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.
 - 1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.10 PROTECTING AND CLEANING

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

END OF SECTION 075216

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. Metal Flashings and Counter Flashings.
 - 2. Miscellaneous Sheet Metal Accessories.
 - 3. All other Sheet Metal, Flashing and Trim indicated or required elsewhere, not specifically specified herein or in other work.
- B. Related Requirements:
 - 1. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.

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. FM Approvals' Listing: Manufacture and install roof-edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification. Identify materials with FM Approvals' markings. Wind Load: Total roof system installation, including Sheet Metal Flashing and Trim Work, shall be in conformance with FM 4450, FM 4470, UL 580 or UL 1890.
- C. Fabricate and install roof edge flashing capable of resisting forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 applicable to the Project site location.
- D. SPRI Wind Design Standard: Manufacture and install roof-edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressures:
 - 1. Design Pressure: Per IBC-2015.
- E. 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 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, ambient; 180 deg F, material surfaces.

F. Comply with Applicable Requirements of the following:

1. Class 1-90 Rating: Provide Roof Specialties Work in conformance with Class 1-90 requirements and coordinated with built-up roofing system and component materials which have been evaluated by an accredited test laboratory to have a Class 1-90 rating.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's material and finish data, product specifications, installation instructions and general recommendations for each specified sheet and flashing material and fabricated product.
- B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, profiles, expansion-joint systems and locations, anchoring methods, keyed details, relationships to adjacent construction and materials, etc. Distinguish between shop- and field-assembled work.
 1. Include plans, elevations, sections, and attachment details.
 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
- A. Qualification Data: For qualified fabricator.
- B. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

1.5 QUALITY ASSURANCES

- 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.
- C. SMACNA AND NRCA DETAILS: Conform work with details shown, and with fabrication requirements of "Architectural Sheet Metal Manual" by SMACNA. Comply with installation details of "Roofing and Waterproofing Manual" by NRCA.
- D. NRCA "Roofing and Waterproofing Manual", current edition. Material and installation specifications published by the insulation and membrane manufacturers.
- E. Class 1-90 Rating: Provide Sheet Metal Flashing and Trim Work in conformance with Class 1-90 requirements and coordinated with built-up roofing system and component materials which have been evaluated by an accredited test laboratory to have a Class 1-90 rating.
- F. Wind Load: Total roof system installation, including Sheet Metal Flashing and Trim Work, shall be in conformance with FM 4450, FM 4470, UL 580 or UL 1890.

- G. 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.
- H. Installer Qualifications: Engage an experienced Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- I. Refer to Roofing Sections for requirements relating to single source responsibility for all roofing and sheet metal work, including guarantees and temporary protection. Sheet Metal Flashing and Trim work shall be in accordance with roofing system manufacturer's requirements so as not to void or compromise the roofing warranty.

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 PROJECT CONDITIONS

- A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of the work and protection of materials and finishes. Coordinate work with other Sections for material and finishes.

1.8 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.
- B. Finish Warranty Period: 20 years from date of Substantial Completion.

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 B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.2 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet (Ice and Water shield): Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.

2.3 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.

- C. 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 wide and 1/8 inch thick.

- D. 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.

- E. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

- F. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

- G. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 MANUFACTURED SHEET METAL FLASHING AND TRIM

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim in the shop to the greatest extent possible, and 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 detectable 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 on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Sealed Joints: Form non-expansion 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 deep, filled with butyl sealant concealed within joints.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- H. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- I. Do not use graphite pencils to mark metal surfaces.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Base Flashing: Fabricate from the following materials unless roof membrane flashing is being installed:
 - 1. Aluminum: 0.040 inch thick.
- B. Counter-flashing and Flashing Receivers: Fabricate from the following materials:
 - 1. Aluminum: 0.032 inch thick.
- C. Roof-Penetration Flashing: Fabricate from the following materials:
 - 1. Stainless Steel: 0.019 inch thick.

2.7 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.019 inch 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. Perform any corrective preparation work required to correct conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Promptly remove protective film, if any, from exposed surfaces of finished metals. Strip with care to avoid damage to finish.

3.3 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

B. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.

3.4 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, 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, levels, and slopes. 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 apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.

4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
 6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. 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 between 40 and 70 deg F, 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.
 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, 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.
 3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 4. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder 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.
- H. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.5 INSTALLATION REQUIREMENTS

- A. General: Except as otherwise indicated, comply with manufacturer's written installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely to structural substrates to withstand lateral and thermal stresses and inward and outward loading pressures, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams that will be permanently watertight and weatherproof. All to be in compliance with manufacturer's recommendations and requirements.
- B. Isolation: Where metal surfaces of units contact dissimilar metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces or provide other permanent separation as recommended by aluminum producer.
- C. Expansion Provisions: Install running lengths to allow controlled expansion for movement of metal components in relation not only to one another but also to adjoining dissimilar materials, including flashing and roofing membrane materials, in a manner sufficient to prevent water leakage, deformation, or damage.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws and/or metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. 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, except reduce pre-tinning where pre-tinned surface would show in completed Work.
- F. Underlayment: Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.
- G. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
- H. Install reglets to receive counterflashing in manner and by methods indicated in Division 07 Section "Roof Specialties."
- I. Install counterflashing in reglets, either by snap-in seal arrangement or by welding in place for anchorage and filling reglet with mastic or elastomeric sealant, and indicated and depending on degree of sealant exposure.
- J. Nail flanges of expansion joint units to curb nailers, at maximum spacing of 6" o.c. Fabricate seams at joints between units with minimum 3" overlap, to form a continuous, waterproof system.

3.6 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, 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.
- B. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.

- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- D. 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 over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant. Secure in a waterproof manner by means of anchor and washer at 36-inch centers.
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric or butyl sealant and clamp flashing to pipes that penetrate roof.

3.7 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA and NRCA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.8 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.9 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch 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."

3.10 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.

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END OF SECTION 076200.

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. Section Includes:

- 1. Roof curbs.
 - 2. Equipment supports.

- B. Related Requirements:

- 1. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Division 07 Section "Sheet Metal Flashing and Trim" for custom- and site-fabricated sheet metal flashing and trim.
 - 3. Division 07 Section "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
- B. Shop Drawings: For roof accessories.

PART 2 - PRODUCTS

2.1 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Material: Aluminum sheet, 0.090 inch thick.
 - 1. Finish: Clear anodic.
- D. Construction:

1. Curb Profile: Manufacturer's standard compatible with roofing system.
2. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
3. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
4. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange or by use of leveler frame.
5. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
6. Liner: Same material as curb, of manufacturer's standard thickness and finish.
7. Nailers: Factory-installed wood nailer along top flange of curb or under top flange on side of curb per roofing manufacturer's detail, continuous around curb perimeter.

2.2 EQUIPMENT SUPPORTS

- A. Equipment Supports: Internally reinforced perimeter metal equipment supports capable of supporting superimposed live and dead loads between structural supports, including equipment loads and other construction indicated on Drawings, spanning between structural supports; capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, integral metal cant, and integrally formed structure-mounting flange at bottom.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Material: Aluminum sheet, 0.090 inch thick.
 1. Finish: Clear anodic.
- D. Construction:
 1. Curb Profile: Manufacturer's standard compatible with roofing system.
 2. Insulation: Factory insulated with 1-1/2-inch- thick glass-fiber board insulation.
 3. Fabricate equipment supports to minimum height of 12 inches above roofing surface unless otherwise indicated.

2.3 METAL MATERIALS

- A. Aluminum Sheet: ASTM B 209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
 1. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
 2. 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.
- B. Aluminum Extrusions and Tubes: ASTM B 221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- 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. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
- C. Seal joints with sealant as required by roof accessory manufacturer refer to Division 07 Section "Joint Sealants".

3.2 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Division 09 Section "Exterior Painting."
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

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. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Butyl joint sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.5 FIELD 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.
 - 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.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, 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.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

2.4 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C 1311.

2.5 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

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 performance of the Work.
- 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.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

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 bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. 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.

- F. 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. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 CLEANING

- 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.

3.5 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, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Joints between metal components.
 - b. Control and expansion joints in and other.
 - c. Other joints as indicated on Drawings.
 1. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
 2. Joint Sealant: Butyl or urethane, nonstaining, S, NS, 25-50, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 099113 - EXTERIOR PAINTING

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 paint systems on the following exterior substrates:

- 1. Steel and iron.
- 2. Galvanized metal.

1.3 DEFINITIONS

- A. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- B. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

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.

1.5 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.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

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

methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Steel and Iron Substrates:

- 1. Water-Based Light Industrial Coating System MPI EXT 5.1C MPI EXT 5.1M:
 - a. Prime Coat: Primer, alkyd, anti-corrosive for metal, MPI #79.
 - b. Prime Coat: Primer, rust inhibitive, water based MPI #107.
 - c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (MPI Gloss Level 5), MPI #163.
 - d. Topcoat: Light industrial coating, exterior, water based, gloss (MPI Gloss Level 6), MPI #164.
- 2. Alkyd System MPI EXT 5.1D MPI EXT 5.1Q:
 - a. Prime Coat: Primer, alkyd, anticorrosive, for metal, MPI #79.
 - b. Topcoat: Alkyd, exterior, semi-gloss (MPI Gloss Level 5), MPI #94.
 - c. Topcoat: Alkyd, exterior, gloss (MPI Gloss Level 6), MPI #9.

B. Galvanized-Metal Substrates:

- 1. Water-Based Light Industrial Coating System MPI EXT 5.3J:
 - a. Prime Coat: Primer, galvanized, water based, MPI #134.
 - b. Topcoat: Light industrial coating, exterior, water based, semi-gloss (MPI Gloss Level 5), MPI #163.
 - c. Topcoat: Light industrial coating, exterior, water based, gloss (MPI Gloss Level 6), MPI #164.
- 2. Alkyd System MPI EXT 5.3B:
 - a. Prime Coat: Primer, galvanized, cementitious, MPI #26.
 - b. Topcoat: Alkyd, exterior, flat (MPI Gloss Level 5), MPI #8.

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- c. Topcoat: Alkyd, exterior, semi-gloss (MPI Gloss Level 5), MPI #94.
- d. Topcoat: Alkyd, exterior, gloss (MPI Gloss Level 6), MPI #9.

END OF SECTION 099113