



TO: Board of Directors  
FROM: Liz Jamieson, Director of Capital Projects  
SUBJECT: MTC Change Order Proposal No. 051 – Roofing & Metal Siding  
DATE: July 7, 2020  
TYPE: Action Needed

According to Board Policy No. 6957, construction Change Orders that exceed \$100,000.00 need Board approval.

Attached is Change Order Proposal (COP) No. 051 for the new Maintenance & Technology Center (MTC) project, increasing the contract with Colacurcio Brothers, Inc., by the amount not to exceed \$271,612.35.

This Change Order Proposal has two separate components.

- 1) Add metal wall system and associated flashing to MTC exterior to cover failed CMU wall to eliminate water intrusion.
- 2) Remove existing roof; replace deteriorated plywood sheathing, and install new roof system, gutters, downspouts and associated metal flashing at MTC building.

This Change Order Proposal does not change the project completion date. The overall contingency budget for all three projects (SHS/ALC/MTC) currently has a balance of \$3,524,456.62. This budget is reserved for change orders.

Please let us know if you have any questions.

**Recommendation:**

We recommend the board **move to approve MTC Change Order Proposal No. 051 to the contract with Colacurcio Brothers, Inc., not to exceed \$271,612.35, related to the new Maintenance & Technology Center project.**

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# CHANGE ORDER PROPOSAL

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PROJECT: **Stanwood-Camano School District Maintenance and Technology Center**

TITLE OF CHANGE: Add Metal Cladding and TPO Roofing.

PROPOSAL NO: 051

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REQUEST FOR MODIFICATION: Colacurcio Brothers Construction Company, Inc. Contractor, The Agreement with Stanwood-Camano School District #401 dated June 24, 2019 request the changes as outlined below and/or detailed on the attachments.

ISSUED BY: Manley McIntyre - Colacurcio Brothers, Inc.

DATE ISSUED: 5/18/2020

Add metal cladding and TPO roofing system as directed in CCD 041.

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**DISTRIBUTION** via e-mail (3) Colacurcio Brothers Construction (Manley McIntyre, Eric Reese, Cathie Wright), (2) McGranahan Architects (Stephen Black, Jason Gover), (2) Stanwood-Camano School District #401 (Victoria Cargile, Liz Jamieson).

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MODIFICATION PROPOSAL TO: **McGranahan Architects**

We propose to perform all changes described in the above request for a total **(ADDITION)** ~~(DEDUCTION)~~ to the

Contract sum of: Two hundred seventy-one thousand six hundred twelve dollars and 35/100. \$271,612.35  
State Sales Tax ~~(INCLUDED)~~ **(EXCLUDED)**

The amount covers all direct costs related to the change. All other provisions of the contract remain in full effect. Attached are Cost Proposal Detail Sheets. We request and **(EXTENSION)** ~~(REDUCTION)~~ (leave blank if "0" days) of **110** calendar days in the completion time because of this change. We agree to be bound by this proposal for 30 days from signature date.

SUBMITTED BY  DATE 5/18/2020  
(Contractor's Signature)

Returned to Contractor for revision/reevaluation. See comments above/attached

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**AUTHORIZATION TO:** McGranahan Architects (Jason Gover) recommends acceptance of the foregoing proposal.

RECOMMENDED BY \_\_\_\_\_ DATE \_\_\_\_\_

AUTHORIZED BY \_\_\_\_\_ DATE \_\_\_\_\_  
(Owner's signature)

As indicated above, the Owner accepts the foregoing proposal and authorizes performance of the changes specified. A Change Order (CO) will follow which includes the Change Order Proposal (COP) amount.

DISTRIBUTION After signature, (1) original retained by Owner, (1) original to Architect, (1) original to Contractor



# Ballard Sheet Metal Works, Inc.

4763 Ballard Avenue N.W. Seattle, Washington 98107 (206)784 0545  
Fax: (206)781- 0118

## Change Order Proposal

Date: 3/5/2020 BSM #9 (CCD041)

General Contractor: Colacurcio Brothers

Project Name: MTC - Stanwood

Attn: Manley

CCD 041 Pricing includes total of 6 security camera boxes (CCD 047) \* note all prefinished sheet metal (boxes/break metal) bid in prefinished 26 gauge sheet metal (only available gauge provided by specified manufacturer). In lieu of soldering prefinished – bidding corners and boxes with closed rivets and caulked.

Shop labor (shear/fab/load) hat, trim	147 hrs x \$92.82 = \$13,644.54
Field labor (install, field measure, foam closures, Wrapshield)	571 hrs X \$92.82 = \$53,000.22
Flatstock prepainted Pearl Gray 26 ga 25.69" x 10'165sheets	\$44.11/ea= \$7,278.15
Metal Panels 26 Nucor Reverse Classic Pearl Gray crating	33sqx\$180/sq= \$5,940.00
Flatsheet 20 gauge galvanized (hats)	33sheetsx\$39.00 = \$1287.00
Flatsheet 24 gauge stainless steel 304 2B	4 sheets x \$90.00 = \$360.00
Accessories (pins/fasteners/sealant, foam closure)	\$840.00
Wrapshield SA	5X\$775 = \$3,875.00
Liquiflash	8X\$25.75 = \$206.00
Equipment/Boomlift	\$2,950.00
Freight – Panels	\$2,650.00
Freight – Wrapshield SA	\$150.00
<b>Subtotal \$92,180.91 x 12% = \$103,242.62 TOTAL</b>	

## Subcontractor Breakdown Summary

Project Name: SCSD Maintenance & Technology Center

Date: 4/4/2020

Sub-Contractor: Sky Northwest, Inc.

Contractor Ref. No. CCD-041

Description: Delete painting at areas to be covered by new metal siding

**1. DIRECT CRAFT LABOR COST (from attached cost breakdown form)** \$ (1,231.00)

a. crew (apprentices, journeymen, & laborers)	\$ (1,231.20)
b. foreman	\$ -
c. lead foreman	\$ -
<b>DIRECT LABOR SUBTOTAL</b>	<b>\$ (1,231.20)</b>

**Labor Markups**

d. direct supervision (NTE 12% of 1a)	\$ -
e. safety (NTE 2% of lines 1a, b, & c)	\$ -

Supervision markup should be zero if any foreman time is included in direct labor costs.

**2. MATERIAL COST (from attached cost breakdown form)** \$ (650.00)

**3. EQUIPMENT COST (from attached cost breakdown form)** \$ -

**SUBTOTAL 1 thru 4** \$ (1,881.00)

**5. FEE** \$ -

a. OVERHEAD/PROFIT NTE 12% portion of 1, 2, 3, & 4 up to	\$ -
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**6. SUB-TIER SUBCONTRACTORS** \$ -

a.	\$ -
b.	\$ -
c.	\$ -
d.	\$ -
e.	\$ -
f.	\$ -

**7. OVERHEAD & PROFIT ON SUB-TIER SUBCONTRACTORS** \$ -

a. NTE 8% of Line 6 up to \$50,000 for each sub	\$ -
b. NTE 6% of Line 6 in excess of \$50,000 for each sub	\$ -

**9. BONDING** \$ -

% of 1-8

**TOTAL COST** \$ (1,881.00)







Commercial Roofing ~ Since 1975

Phone: 425-512-8289

2020 Blackford Avenue, #10 Spokane, WA 99290 • Cont. #RAINB0117306

**CHANGE ORDER REQUEST**

**Project:** Stanwood MTC – Maintenance Building

**Date of Bid:** April 13, 2020

**Estimator:** Stefani Christian

**Plans and Specification Section 075320 (per CCD 041)**

- Cut any large blisters in the existing roof system.
- Remove all existing edge metal.
- Mechanically attach one (1) layer of 3.5” polyiso insulation (R-20.5) at the west, middle and over heated space on the east deck only.
- Fully adhered one (1) layer of 3.5” polyiso insulation (R-20.5) at the west, middle and over heated space on the east deck only.
- Fully adhered ¼” dens deck primed at the west, middle and over heated space on the east deck only.
- Mechanically attach ¼” dens deck primed at the unheated space on the east deck only.
- Fully adhere 60 mil TPO roof membrane.
- Furnish TPO Clad metal to the sheet metal sub (includes 16 sheets of 4 x 10) for fabrication and installation of the TPO edge metal.
- Furnish and install tapered insulation transition from insulated to non-insulated are on the east side of the building.
- Strip in all new edge metal (by others) to make it a watertight condition.
- Meets a UL Class A fire rating.
- Meets FM 1-90 requirements as if installed over a proper FM approved deck.
- Includes a 72 mph wind rider to the Carlisle warranty.
- Includes a 20-year Manufacturer’s No Dollar Limit Warranty for labor and materials.

<b><u>Total Base Bid LABOR:</u></b>	<b>\$ 56,868.00</b>
<b><u>Total Base Bid MATERIALS:</u></b>	<b>\$ 42,223.00</b>
<b><u>Subtotal of Labor and Materials:</u></b>	<b>\$ 99,091.00</b>
<b><u>12% OH&amp;P:</u></b>	<b>\$ 11,891.00</b>
<b><u>TOTAL CHANGE ORDER REQUEST:</u></b>	<b>\$ 110,982.00</b>

**Exclusions:**

As-Builts  
 Bonds, permits or W.S.S.T. (unless listed above).  
 Roof protection from other trades.  
 Roof accessories.  
 Wood or wood working.

Walkpad  
 Weather delays  
 Handling of hazardous materials  
 Wind speeds exceeding 72mph  
 Metal or metal working



22706 58<sup>th</sup> Place South  
 Kent, WA 98032-4666  
 Licenses WA #INSULCI 117 KS OR #95002

Phone: (253) 395-1895  
 Fax: (253) 395-1896

# PROPOSAL

May 7, 2020  
 Estimator: John Jenkins

**Colacurcio Brothers Construction Company Inc.**  
**Manley McIntyre**

**Project: Stanwood Schools Maintenance & Technology Center Renovations**

This proposal of work includes all labor, material and equipment as is necessary to complete work as detailed below.

**Scope of Work: Additional Work at the Maintenance Building**

**Add \$ 744.00 to install R-19 batts and 10 mil poly vapor retarder at the additional exterior walls at the Maintenance Building. Please see attached signed extra work order dated 4-17-20.**

Labor Hours	7 hours	x	\$ 80.00	=	\$ 560.00
R-19 Fiberglass					
Batts	170 sq. ft.	x	\$ .30	=	\$ 51.00
10 Mil Poly	.25 roll	x	\$ 144.55	=	\$ 36.13
Subtotal				=	\$ 647.13
12 % Mark Up				=	\$ 97.06
Total Add				=	\$ 744.19

We have not included sales tax in our proposal  
 Price quoted valid for 30 days

Thermal ♦ Acoustical ♦ Commercial ♦ Industrial



**CONSTRUCTION CHANGE DIRECTIVE: 041**

**MTC – ADD EXTERIOR CLADDING, ROOF INSULATION & RE-COVER, REMOVE EXIST INSULATION**

**CONTRACT MODIFICATION:**

The Contractor is hereby directed to make the following change(s) to the Work:

1. Add to scope of work, at Maintenance Building, wall type 04ANA which is to be installed along Gridline L/2-6, Gridline 6/A-L and extending northward at Gridline 6/A to cover CMU wall extension as shown in plan. Install 04ANA along Gridlines E/1-6 and F/1-6 as shown in plan.
  - a. Install weather resistant barrier, where indicated on plan.
  - b. Install horizontal furring strips as noted on plan.
  - c. Install 24-gauge Nucor metal wall panel.
  - d. Install flashing where indicated on plan.
2. Add to scope of work, at Maintenance Building roof, partial removal of exist roof membrane, removal of exist roof flashing, gutters and downspouts and installation of new roof, flashing, gutters and downspouts as shown on drawings.
  - a. Remove existing gutters & flashing per roofing contractor's proposal.
  - b. Partially remove existing roof membrane as necessary for installation of new roof system.
  - c. Install rigid insulation at the roof, per plan.
  - d. Install coverboard, per plan.
  - e. Install 60 mil TPO membrane, per plan.
  - f. Install flashing, gutters and downspouts
3. Add Spec Section 07 42 15 Metal Wall Panels.
4. Add Spec Section 07 53 20 Single Ply Roofing
5. Add to scope of work, at the Maintenance Building roof, removal of existing FSK and existing batt insulation between Gridlines E6 to F1.

Reference: G0.01, A2.00, A2.07, A2.10, A2.11, A2.12, A2.19, A2.20, A2.21, Construction Drawings, Project Specifications

Attachments: G0.01, A2.00, A2.07, A2.10, A2.11, A2.12, A2.19, A2.20, A2.21, Spec Section 07 42 13 Metal Wall Panels, Spec Section 07 53 20 Single Ply Roofing.

**PROPOSED CONTRACT ADJUSTMENTS:**

The Contract Sum will be adjusted on following basis:

- Lump Sum (increase) (decrease) of:
- As provided in Article 7 of the General Conditions or,
- As follows: Time and Materials:

The Contract Time will:

- Remain unchanged;
- (Increase) (Decrease) by    days or;
- Be adjusted as provided in Article 8 of the General Conditions.

*When issued by the Architect and approved by the Owner, this document shall serve as authorization to proceed with the Work as described above. The Contractor shall proceed IMMEDIATELY. When the actual adjustments to the Contract Sum and/or Contract Time are agreed to by the Architect, Owner and Contractor, this Work shall be added to the Contract by Change Order.*

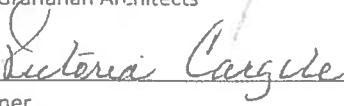
**Stanwood Maintenance and Technology Center**

Stanwood - Camano School District No. 401

1426-12

Issued By:   
McGranahan Architects

Date: 04/02/2020

Approved By:   
Owner

Date: 04/03/2020

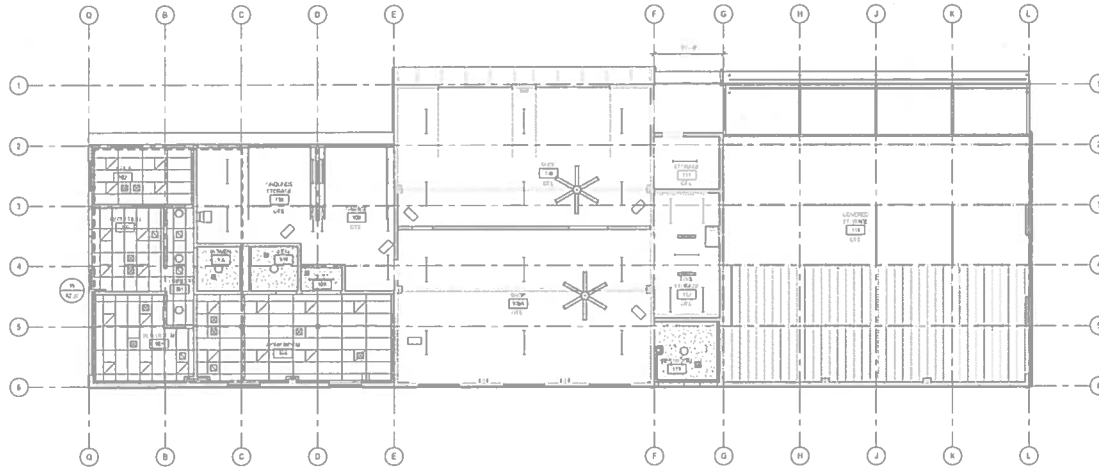
*Signature below indicates the Contractor's acknowledgement of the direction to proceed with the Work immediately.  
The Contractor  (agrees)  (disagrees) with the proposed method of adjustment in the Contract Sum and Contract Time.*

Accepted By: \_\_\_\_\_  
Contractor

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







REFLECTED CEILING PLAN 2  
S.W. 1/4" = 1'-0"

GENERAL

1. ALL DIMENSIONS ARE TO FACE UNLESS SPECIFIED OTHERWISE.
2. ALL EXTERIOR WALLS ARE 16" THICK CONCRETE.
3. ALL INTERIOR WALLS ARE 12" THICK CONCRETE.
4. SEE SECT A-M FOR FINISH SCHEDULES.
5. SEE SECT A-M FOR FINISH SCHEDULES.
6. CEILING JOISTS ARE 16" O.C. UNLESS OTHERWISE SPECIFIED.
7. FLOOR JOISTS ARE 16" O.C. UNLESS OTHERWISE SPECIFIED.
8. FLOOR FINISH IS 3/4" THICK POLISHED CONCRETE.
9. ALL FLOOR FINISHES ARE TO BE FINISHED TO A FINISH GRADE OF 1'-0" UNLESS OTHERWISE SPECIFIED.
10. ALL FLOOR FINISHES ARE TO BE FINISHED TO A FINISH GRADE OF 1'-0" UNLESS OTHERWISE SPECIFIED.
11. SEE SECT A-M FOR FINISH SCHEDULES.
12. SEE SECT A-M FOR FINISH SCHEDULES.
13. SEE SECT A-M FOR FINISH SCHEDULES.
14. SEE SECT A-M FOR FINISH SCHEDULES.
15. SEE SECT A-M FOR FINISH SCHEDULES.

LEGEND

- GENERAL NOTES:
- 1. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
  - 2. ALL EXTERIOR WALLS ARE 16" THICK CONCRETE.
  - 3. ALL INTERIOR WALLS ARE 12" THICK CONCRETE.
  - 4. SEE SECT A-M FOR FINISH SCHEDULES.
  - 5. SEE SECT A-M FOR FINISH SCHEDULES.
  - 6. CEILING JOISTS ARE 16" O.C. UNLESS OTHERWISE SPECIFIED.
  - 7. FLOOR JOISTS ARE 16" O.C. UNLESS OTHERWISE SPECIFIED.
  - 8. FLOOR FINISH IS 3/4" THICK POLISHED CONCRETE.
  - 9. ALL FLOOR FINISHES ARE TO BE FINISHED TO A FINISH GRADE OF 1'-0" UNLESS OTHERWISE SPECIFIED.
  - 10. ALL FLOOR FINISHES ARE TO BE FINISHED TO A FINISH GRADE OF 1'-0" UNLESS OTHERWISE SPECIFIED.
  - 11. SEE SECT A-M FOR FINISH SCHEDULES.
  - 12. SEE SECT A-M FOR FINISH SCHEDULES.
  - 13. SEE SECT A-M FOR FINISH SCHEDULES.
  - 14. SEE SECT A-M FOR FINISH SCHEDULES.
  - 15. SEE SECT A-M FOR FINISH SCHEDULES.



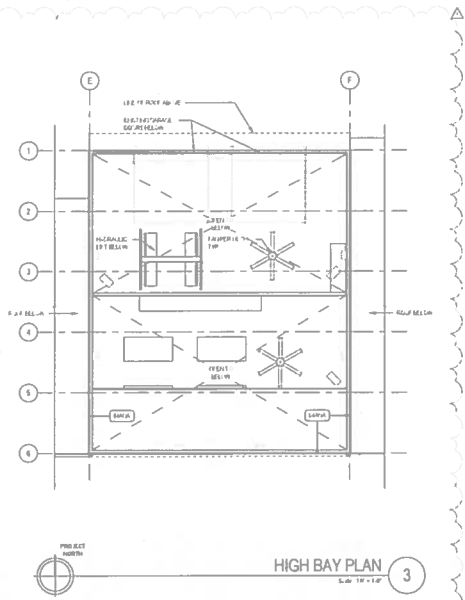
PROJECT: MAINTENANCE & TECHNOLOGY CENTER  
 CLIENT: STANFORD-CANAD SCHOOL DISTRICT  
 LOCATION: STANFORD, WA

PROJECT NO. 1422.002  
 MAINTENANCE BUILDING FLOOR PLAN AND REFLECTED CEILING PLAN

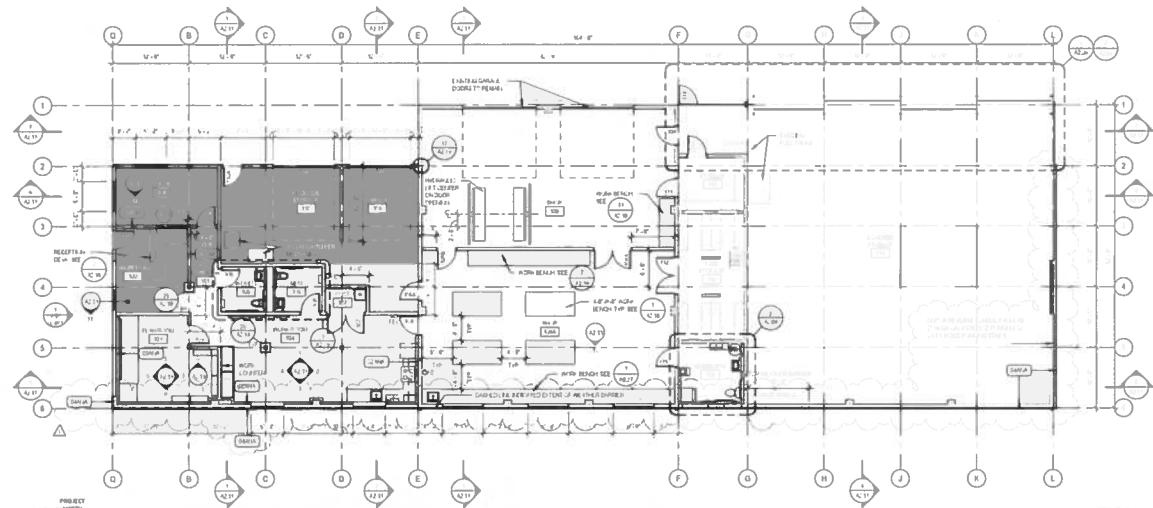
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 DRAWN BY: J. KELLY  
 CHECKED BY: J. KELLY  
 PROJECT NO. 1422.002

DATE: 08/14/14  
 DRAWN BY: J. KELLY  
 CHECKED BY: J. KELLY  
 PROJECT NO. 1422.002

DATE: 08/14/14  
 DRAWN BY: J. KELLY  
 CHECKED BY: J. KELLY  
 PROJECT NO. 1422.002



HIGH BAY PLAN 3  
S.W. 1/4" = 1'-0"



FLOOR PLAN 1  
S.W. 1/4" = 1'-0"

ORIGINAL SHEETS BY: J. KELLY  
 DATE: 08/14/14  
 PROJECT NO. 1422.002

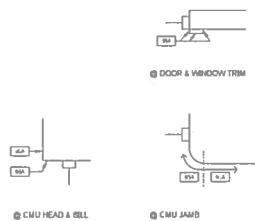
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 CHECKED BY: J. KELLY  
 PROJECT NO. 1422.002

DATE: 08/14/14  
 DRAWN BY: J. KELLY  
 CHECKED BY: J. KELLY  
 PROJECT NO. 1422.002



PHOTOS w / PAINT CALL-

6



TYPICAL PAINT DIAGRAM

5

LEGEND

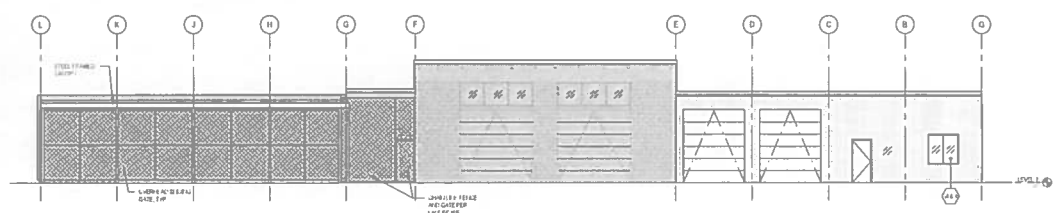
- ① EXTERIOR STEEL TO MATCH [A]
- ② EXTERIOR PAINT TO MATCH [A]
- ③ CMU HEAD & SILL TO MATCH [A]
- ④ CMU SILL TO MATCH [A]
- ⑤ EXTERIOR STEEL PANEL TO MATCH [A]
- ⑥ EXTERIOR STEEL PANEL TO MATCH [A]
- ⑦ WOOD PANEL TO MATCH [A]

GENERAL

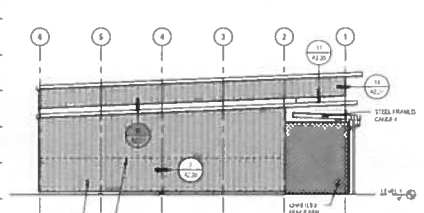
1. USE BEST MATERIALS AVAILABLE
2. SEE ALL RELATED DRAWINGS

CLADDING GENERAL NOTES:

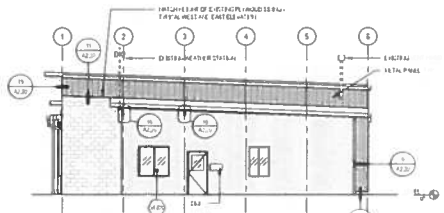
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2. ALL EXTERIOR CLADDING SHALL BE INSTALLED OVER A 1/2" THICK Gypsum Board OR 1/2" THICK INSULATED Gypsum Board UNLESS NOTED OTHERWISE.



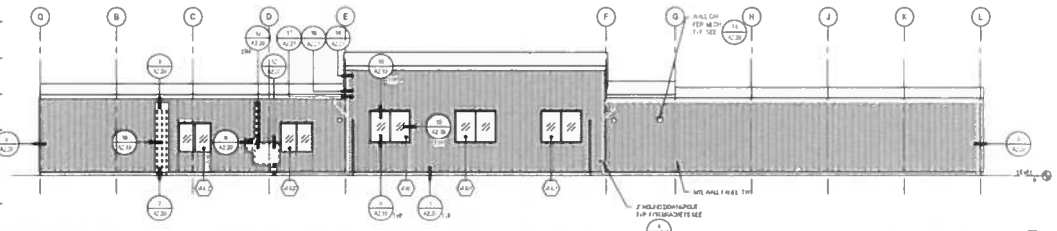
NORTH ELEVATION 3



EAST ELEVATION 4



WEST ELEVATION 2



SOUTH ELEVATION 1

ARCHITECT  
 HOBBAN/KASPER ARCHITECTS  
 CONSULTING ARCHITECTS  
 10000 10TH AVENUE, S.E.  
 BELLEVUE, WA 98003  
 PHONE: (206) 461-1111  
 FAX: (206) 461-1112  
 WWW: HOBBAN-KASPER.COM



PROJECT  
 MAINTENANCE & TECHNOLOGY CENTER  
 STANFORD-GAMMA SCHOOL DISTRICT  
 STANFORD, WA

PROJECT NUMBER  
 MAINTENANCE BUILDING EXTERIOR ELEVATIONS

DATE  
 15 MAR 10  
 16 APR 10  
 16 APR 10  
 16 APR 10  
 16 APR 10

DATE  
 15 MAR 10  
 16 APR 10  
 16 APR 10







ARCHITECT  
 HOBAS/ARCHITECTS  
 15000 15TH AVENUE  
 WESTMINSTER, CO 80039  
 ARCHITECT OF RECORD  
 PEI STRUCTURAL SOLUTIONS  
 MECHANICAL ENGINEER  
 ECE ENGINEERS  
 ELECTRICAL ENGINEER  
 MCE ENGINEERS  
 CIVIL ENGINEER OF RECORD  
 ENR/ENGINEERING INC.

FOR THE ARCHITECT  
 CHRISTOPHER J. KELLEY  
 TITLE: ARCHITECT

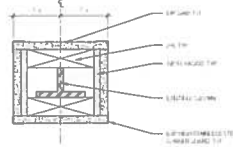
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 MAINTENANCE & TECHNOLOGY  
 CENTER  
 STANFORD-CAMDEN SCHOOL  
 DISTRICT  
 STANFORD, WA

Project No. 143833  
**MAINTENANCE  
 BUILDING  
 DETAILS**

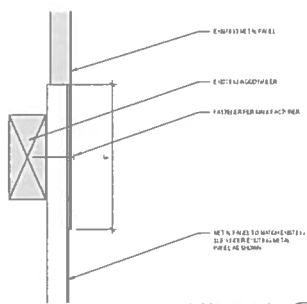
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 DESIGN DEVELOPMENT 15/04/11  
 CD/CONCEPT 12/14/11  
 PERMIT SET 10/14/11  
 COMPANION SET 08/14/11  
 PERMIT SUBMITTAL 06/14/11

DATE: 12/14/11  
 02/11/11  
 04/11/11  
 06/11/11

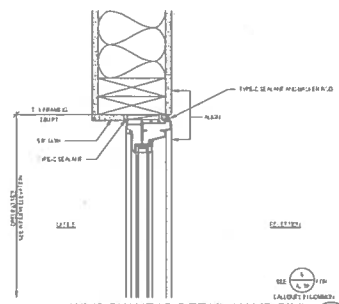
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**A2.19**



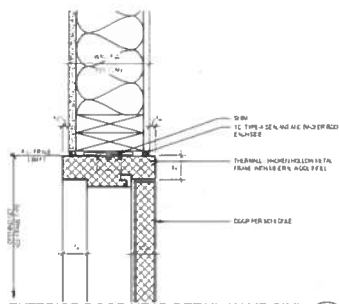
INTERIOR DETAIL 20



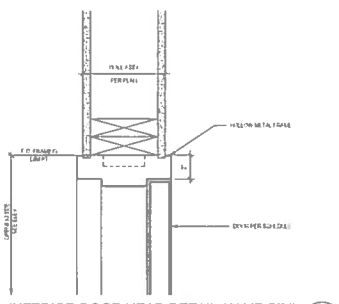
METAL PANEL TRANSITION DETAIL 16



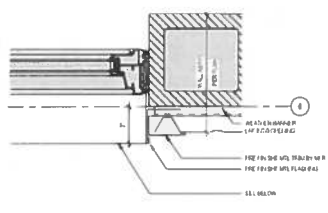
WINDOW HEAD DETAIL (JAMB SIM) 12



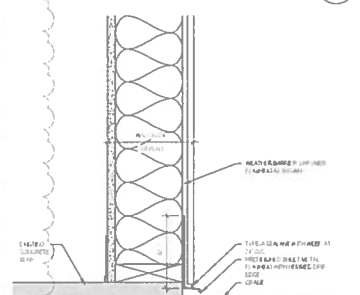
EXTERIOR DOOR HEAD DETAIL (JAMB SIM) 8



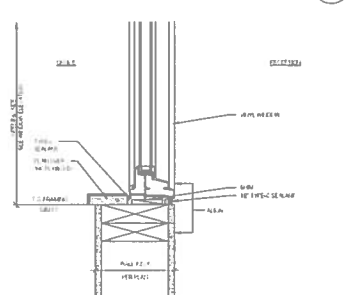
INTERIOR DOOR HEAD DETAIL (JAMB SIM) 4



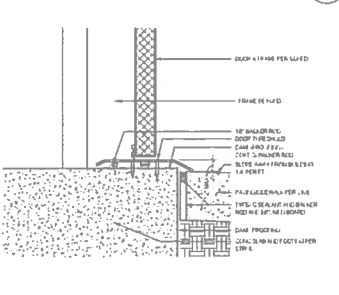
05 - WDO JAMB 19



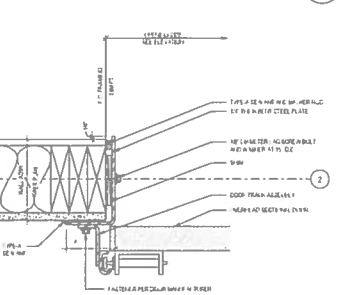
BASE OF WALL DETAIL 15



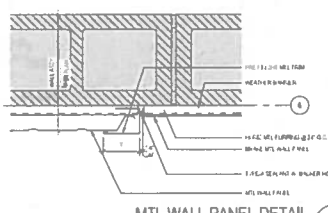
WINDOW SILL DETAIL 11



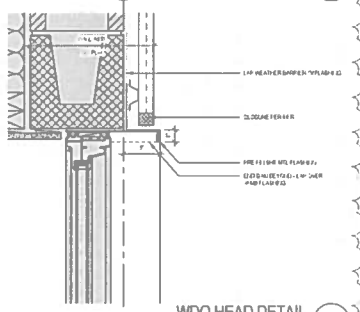
EXTERIOR DOOR THRESHOLD DETAIL 7



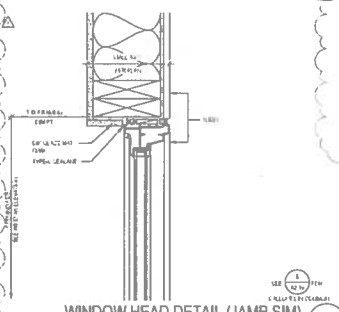
SECTIONAL DOOR JAMB DETAIL 3



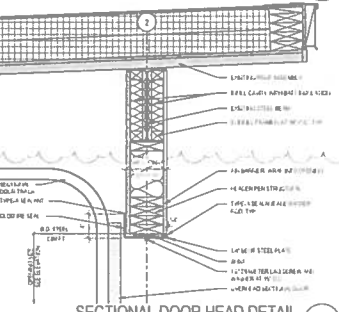
MTL WALL PANEL DETAIL 18



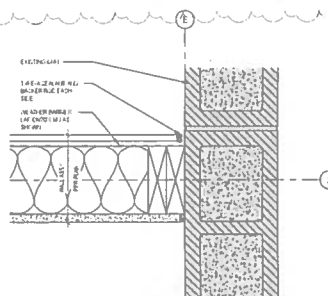
WDO HEAD DETAIL 10



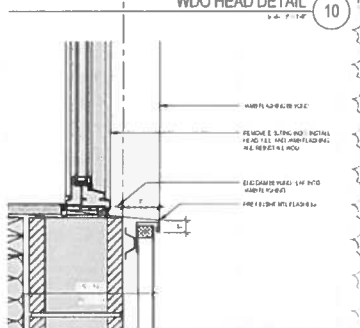
WINDOW HEAD DETAIL (JAMB SIM) 6



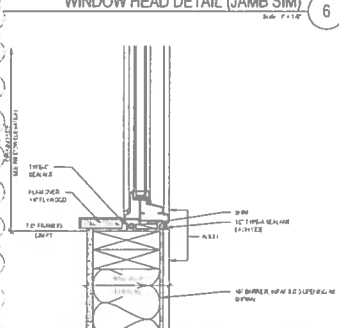
SECTIONAL DOOR HEAD DETAIL 2



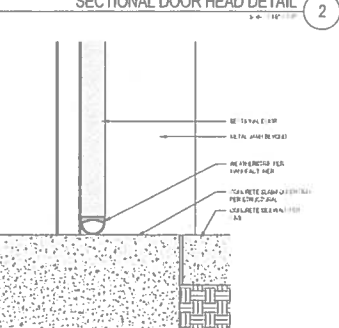
WALL TERMINATION DETAIL 17



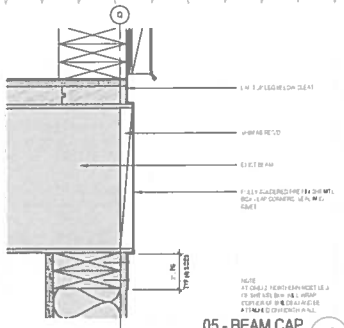
WDO SILL DETAIL 9



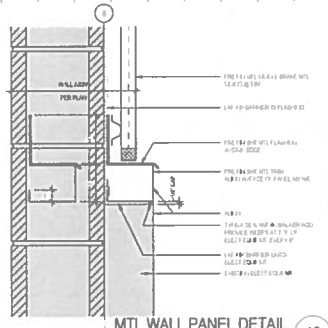
WINDOW SILL DETAIL 5



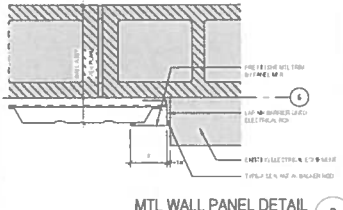
SECTIONAL DOOR SILL DETAIL 1



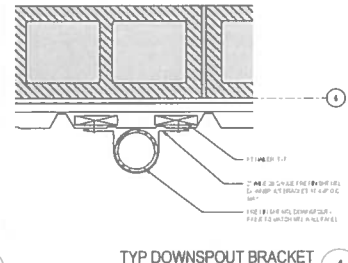
05 - BEAM CAP  
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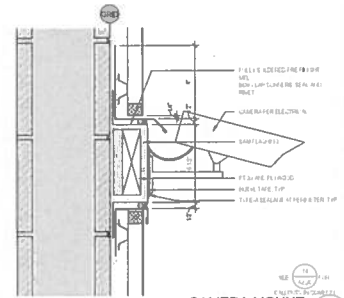
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S.D. P-108



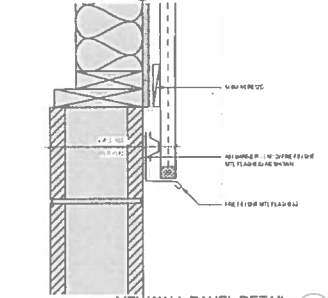
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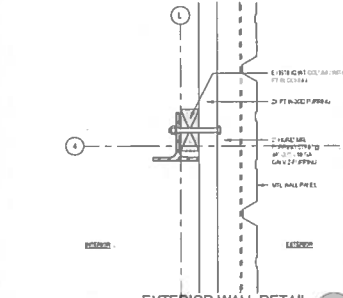
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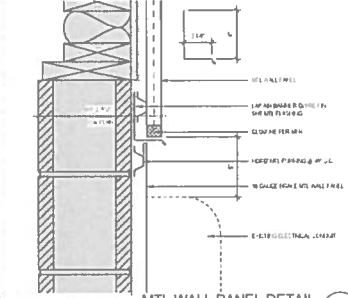
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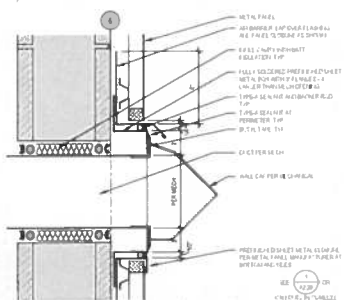
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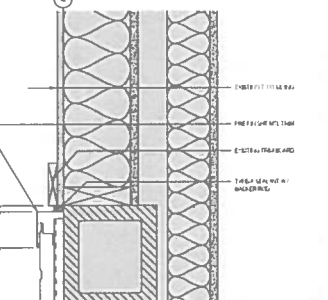
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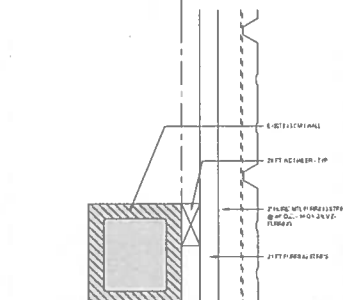
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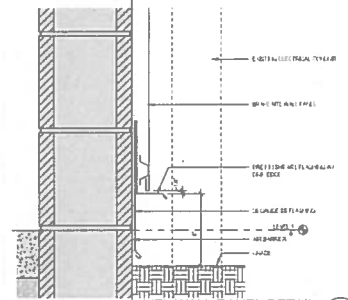
METAL PANEL PENETRATION  
S.D. P-116



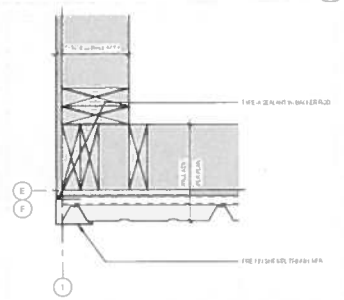
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S.D. P-117



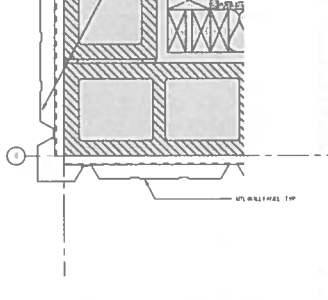
PLAN DETAIL  
S.D. P-118



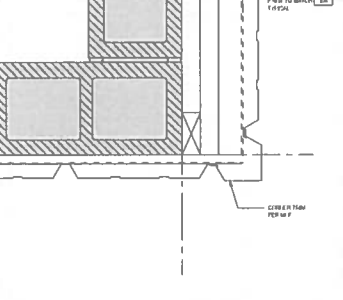
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S.D. P-119



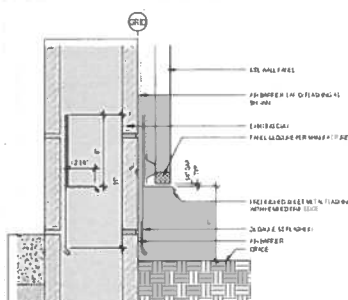
05 - MTL CORNER HIGH  
S.D. P-120



PLAN DETAIL  
S.D. P-121



PLAN DETAIL  
S.D. P-122



BASE OF WALL  
S.D. P-123

**VAPROSHIELD**  
2 Sides & Sides, 2 Sides & Sides

Penetrations



For all penetrations, first VaproLiqui-Flash evenly at least 2" up the face and at least 1" out along all sides of the penetration.

**WRAPSHIELD SA**  
SELF-ADHERED  
**VAPROLIQUI-FLASH**

DESIGNED BY AP DATE: 04/10/14

PROJECT DESCRIPTION: VaproLiqui-Flash is a liquid-applied, self-adhering, elastomeric membrane that provides a waterproofing barrier for all penetrations.

WRAPSHIELD SA is a self-adhering, elastomeric membrane that provides a waterproofing barrier for all penetrations.

WRAPSHIELD SA is a self-adhering, elastomeric membrane that provides a waterproofing barrier for all penetrations.

WRAPSHIELD SA is a self-adhering, elastomeric membrane that provides a waterproofing barrier for all penetrations.

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WRAPSHIELD SA is a self-adhering, elastomeric membrane that provides a waterproofing barrier for all penetrations.

ARCHITECT  
MOHRAN+PARTNERS ARCHITECTS  
CHIEF ARCHITECT  
CORPORATE ARCHITECT  
MECHANICAL GROUP  
STRUCTURAL ENGINEER  
PCA STRUCTURAL SOLUTIONS  
MECHANICAL ENGINEER  
BCE ENGINEERS  
ELECTRICAL ENGINEER  
BCE ENGINEERS  
GENERAL CONTRACTOR  
SHERIDAN CONSTRUCTION, INC.

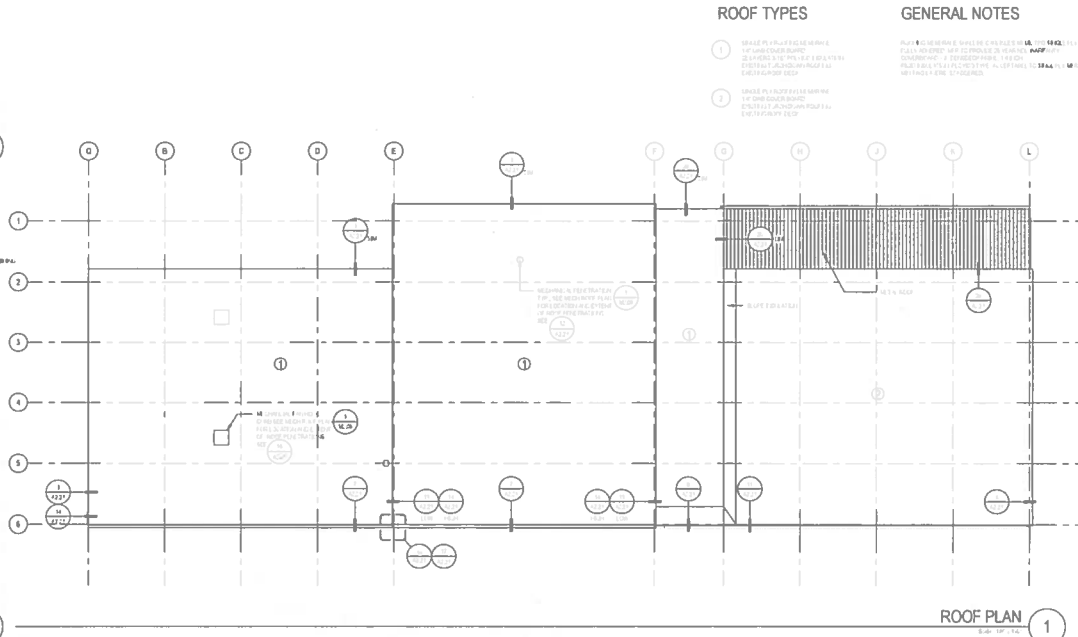
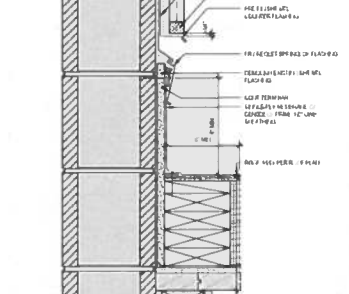
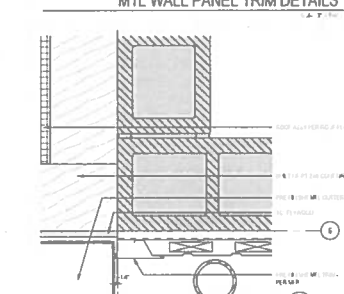
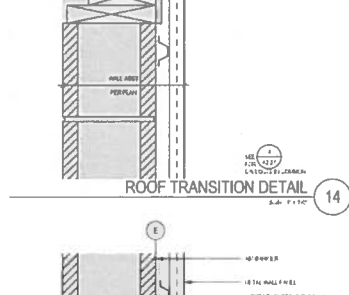
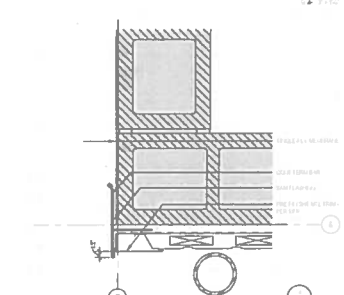
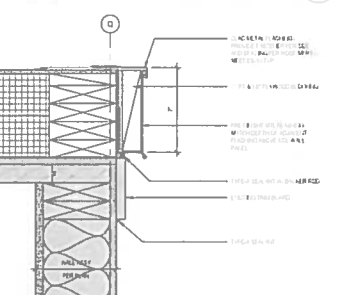
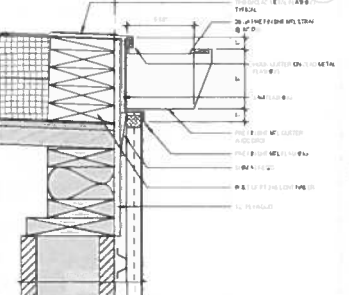
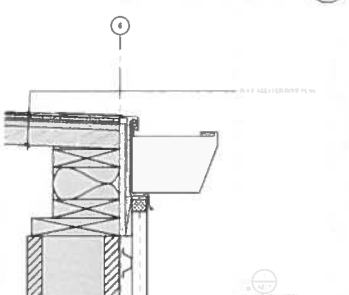
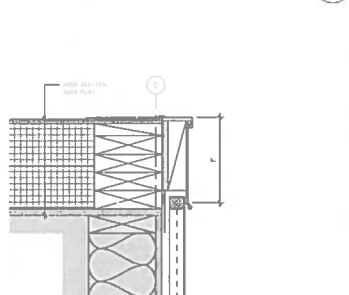
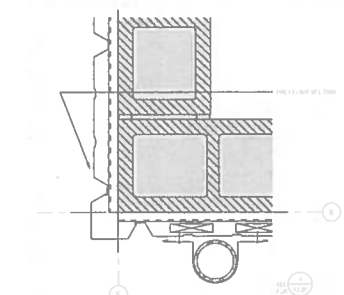
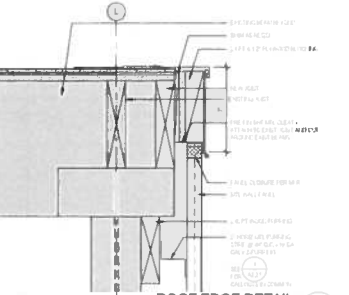
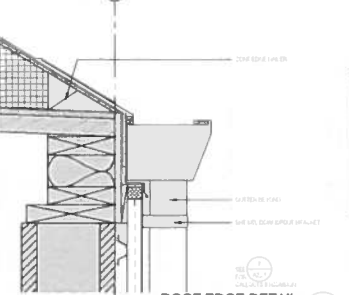
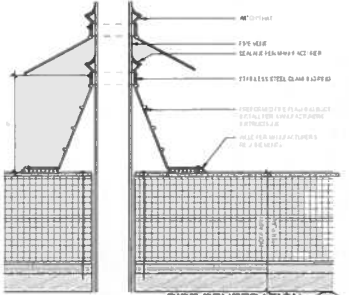
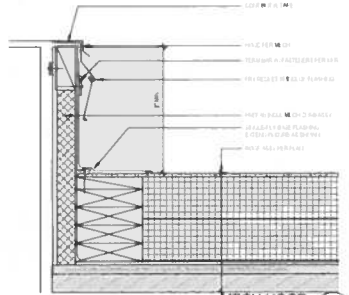
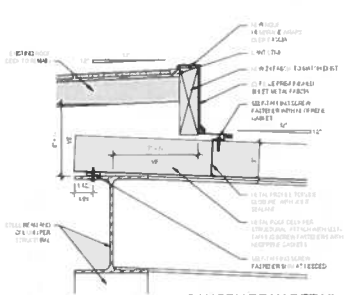
PROJECT LOCATION  
STANFORD JUNIOR SCHOOL  
SITE OF RECONSTRUCTION

PROJECT LOCATION  
STANFORD JUNIOR SCHOOL  
DISTRICT  
STANFORD, WA

PROJECT NAME  
MAINTENANCE BUILDING  
EXTERIOR  
DETAILS

DATE  
DAS  
DRAWN BY  
CA  
CHECKED BY  
ASST.

A2.20



ARCHITECT  
MORGAN AND DETMERS  
1011 14TH STREET  
CROFTON, MD 21114  
STRUCTURAL ENGINEER  
PCL STRUCTURAL SOLUTIONS  
10000 WOODBURN ROAD  
ROCKVILLE, MD 20850  
MECHANICAL ENGINEER  
ICE ENGINEERS  
10000 WOODBURN ROAD  
ROCKVILLE, MD 20850  
ELECTRICAL ENGINEER  
ICE ENGINEERS  
10000 WOODBURN ROAD  
ROCKVILLE, MD 20850

THE HENNINGSEN ARCHITECTS  
10000 WOODBURN ROAD  
ROCKVILLE, MD 20850

PROJECT  
MAINTENANCE & TECHNOLOGY CENTER  
10000 WOODBURN ROAD  
ROCKVILLE, MD 20850

Project No. 202002  
**MAINTENANCE BUILDING EXTERIOR DETAILS**

DATE: 08/20/20  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]  
DATE: 08/20/20

A2.21

## METAL WALL PANELS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Manufactured steel panels for walls, with related flashings and accessory components.
- B. Shimming of furring and hat channels to install metal panels plumb and level.
- C. Provide sufficient fastening for project design wind speed.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 35 00 - WSSP Sustainable Building Requirements.
- B. Section 01 40 00 - Quality requirements: Mock-up.
- C. Section 05 40 00 - Cold-Formed Metal Framing: Wall panel substrate and "Z" furring for insulation and hat channel installation..
- D. Section 07 13 00 - Membrane Flashings. Self adhering flashing installed with Metal Wall Panels.
- E. Section 07 21 00 - Board and Batt Insulation. Insulation for installation under hat channels at "Z" furring.
- F. Section 07 92 00 - Joint Sealants: Sealants installed at metal wall panels.
- H. Section 09 20 00- Gypsum Sheathing.
- I. Structural Drawings: Project wind speed.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- B. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010.
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- D. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

#### 1.04 DESIGN REQUIREMENTS

- A. Maximum Allowable Deflection of Panel: 1/90 of span.
- B. See Structural Drawings for project design wind speed of 115 MPH. Provide sufficient attachment to meet positive and negative pressures resulting from this wind speed.
- C. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
- D. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
- E. Products: Provide continuity of thermal barrier at building enclosure elements .
- F. Provide panel fastening that meets the requirements of this project.

#### 1.05 SUBMITTALS

- A. See Division 1 for submittal procedures.
- B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.
- C. Samples: Submit two samples of wall panel, 12 inch by 12 inch in size illustrating finish color, sheen, and texture.
- D. Submit sample of each aluminum molding and two samples of each laminated panel indicated.
- E. Submit Structural calculations demonstrating that panel fastening meets the uplift and pressure requirements of the project wind speed.



### 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

### 1.07 MOCK-UP

- A. Construct mock-up of each wall panel system specified herein. Mock-up size shall be approximately 10 feet long by 10 feet wide; include panel system, glazing, attachments to building frame, associated vapor retarder and air seal materials, weep drainage system, sealants and seals, related insulation, and flashing in mock-up.
- B. Mock-up: A combined mock-up will be constructed that will include metal framing, sheathing, air barrier, masonry, metal siding, aluminum siding, fiberglass windows and storefront, flashing and sealants.
  - 1. Provide masonry for an approximately 100 square foot mock-up.
  - 2. The mock-up may not remain as part of the work.
  - 3. See Drawings for size and configuration.
- C. See Drawings for required mock-up configuration. Locate where directed.
- D. See Section 01 40 00 - Quality Requirements for additional requirements.
- E. Mock-up may not remain as part of the Work.

### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- B. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that may cause discoloration or staining of products.

### 1.09 WARRANTY

- A. See Division 1 for Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after the Date of Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.
- C. Correct defective Work within a five year period after the Date of Substantial Completion, including defects in water tightness and integrity of seals.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS OF METAL WALL PANELS:

- A. Basis of Design is the Reverse Classic Panel by Nucor Building Systems..
- B. Other acceptable manufacturers (acceptance contingent on Architects approval of panel profile):
  - 1. Morin.
  - 2. Centria.
- C. Substitutions: See Section 01 60 00 - Product Requirements.
  - 1. Products must fully comply with specified requirements and meet all of the requirements of the Basis of Design panel..

### 2.02 MANUFACTURED METAL WALL PANELS

- A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
  - 1. Provide exterior panels, interior liner panels, soffit panels, and subgirt framing assembly.
  - 2. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall.
  - 3. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
- B. Metal Wall Panels:
  - 1. Prefinished Zinalume sheet, ASTM AZ50 made up of 55% aluminum, 1.6% silicon and the balance zinc as described in ASTM specification A792.
  - 2. Gauge: 24 gauge.

3. Factory fabricated panels - 36" net panel coverage.
4. Panel profile:
  - a. Height: 1 1/4".
  - b. Width: 36" panel coverage.
5. Acceptable panel: Reverse Classic Pattern by Nucor Building Systems..

### 2.03 MATERIALS

- A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

### 2.04 ACCESSORIES

- A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.
- B. Sealants:
  1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
  2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
- C. Sealants: Specified in Section 07 92 00. Manufacturer's standard type suitable for use with installation of system; non-staining; color as selected.
- D. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
- E. Field Touch-up Paint: As recommended by panel manufacturer.
- F. Hat channel: 7/8" 20 gauge hat channel furring.
- G. "Z" Furring: 20 gauge "Z" furring - size as indicated on the Drawings.
- H. 16 gauge pre-finished metal backing material. Install where other features are shown to be installed at metal wall panels.
- I. Clips and accessories required for installation of all panels.

### 2.05 FINISH

- A. Fluorocarbon Coating:
  1. Full strength 70% Kynar 500® coating baked on to a nominal dry-film thickness of 1.0 mil.
  2. 20% reflective gloss (ASTM D 523). (Low Gloss).
  3. 0.3 mil baked on epoxy primer.
  4. Colors: See Drawings for colors and locations.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that building framing members are ready to receive panels.
- B. Verify that the weather barrier has been installed over substrate completely and correctly.

### 3.02 PREPARATION

- A. Verify Furring system installation is complete and ready for the installation of wall panels.
- B. Verify installation of insulation is complete.

### 3.03 INSTALLATION

- A. Comply with manufacturer's instructions for assembly, installation, and erection in order to achieve weathertight installation. Install in accordance with approved shop drawings.
- B. Anchor component parts securely in place allowing for expansion and contraction resulting from thermal and structural movement. Provide expansion joints in sheet metal work at necessary intervals.
- C. Dissimilar Members:

1. Where sheet metal is in contact with dissimilar metals, execute juncture to facilitate drainage and minimize possibility of galvanic action.
  2. At point of contact with dissimilar metal, coat metal with protective paint or tape which can be placed between metals.
- D. Field apply sealant to penetrations, transitions, and other locations necessary (not standing seam) for airtight, waterproof installation.
- E. Provide expansion joints where indicated.

**3.04 TOLERANCES**

- A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.
- B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

**3.05 CLEANING**

- A. Remove site cuttings from finish surfaces.
- B. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

**END OF SECTION**

## SINGLE PLY ROOFING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Elastomeric roofing membrane, fully adhered .
- B. Insulation: Flat and tapered sections.
- C. Flashings.
- D. Roofing accessories.
- E. TPO Coated Metal (Clad Metal).

#### 1.02 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: Treated wood nailers and blocking
- B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counter-flashings.

#### 1.03 REFERENCES

- A. ASTM D 751 - Standard Test Methods for Coated Fabrics; 1995.
- B. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- C. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fourth Edition.
- D. ANSI/SPRI/FM 4435 ES-1 Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2017.
- E. ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low-Slope Roofing Systems; 2003.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Submittals, Shop Drawings, Product Data & Samples, for submittal procedures.
- B. Product Data:
  - 1. Product data sheets for each material required, including:
    - a. Membrane.
    - b. Membrane adhesive.
    - c. Insulation.
    - d. Fasteners.
    - e. Caulk and sealants.
    - f. Un-reinforced flashing material.
    - g. Other required materials.
  - 2. Standard details for each applicable project condition.
  - 3. Installation instructions.
- C. Samples:
  - 1. Insulation: Three 12 x 12 inch pieces.
- D. Certification: Membrane manufacturer's written approval of this specification and of any proposed deviations from the specification or drawings or previously approved details. The manufacturer's approval does not constitute a waiver of the requirements of this specification or the drawings or approval of deviations not specifically itemized.
- E. Written approval by authorized representative of the insulation manufacturer certifying suitability for use and the performance of the product in the proposed system.

### 1.05 QUALITY ASSURANCE

- A. Pre-application Roofing Conference: Approximately two weeks prior to scheduled commencement of roofing installation and associated work, meet at project site with Installer, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing that must precede or follow roofing work (including mechanical work if any), Architect, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of the work, including (where applicable) Owner's insurer, test agencies, and governing authorities.
1. Review foreseeable methods and procedures related to roofing work, including but not necessarily limited to the following:
    - a. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations, and other preparatory work performed by other trades.
    - b. Review structural loading limitations of deck and inspect deck for loss of flatness and for required mechanical fastening.
    - c. Review roofing system requirements (drawings, specifications, and other contract documents).
    - d. Review required submittals, both completed and yet to be completed.
    - e. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - f. Review required inspection, testing, certifying, and material usage accounting procedures.
    - g. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
  2. Record discussions of conference, including decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
  3. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
  4. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
  5. Installer Qualifications: Roofing contractor authorized by roof membrane manufacturer.
    - a. Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

### 1.06 SYSTEM DESCRIPTION

- A. Mechanically fastened membrane applied roofing with U.L. Class A rating. Note: It is the sole responsibility of roofing membrane manufacturer to provide necessary barrier board over insulation to achieve U.L. Class A rating.
- B. Installation in compliance with Factory Mutual Class I-90 with special warranty provisions to withstand 70 mph wind damage.

### 1.07 DELIVERY AND STORAGE

- A. Deliver materials with packaging labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions.
- B. Store materials in their original undamaged packaging; maintain storage conditions in accordance with the manufacturer's requirements.

### 1.08 PROJECT CONDITIONS

- A. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.

### 1.09 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 80 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

### 1.10 WARRANTY

- A. See Section 01 74 50 - Warranty Procedures, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.
- C. Provide an NDL material (membrane) and labor warranty, 20-year period.
- D. Submit installer's request for warranty to manufacturer, before delivery to Architect.

## PART 2 PRODUCTS

### 2.01 MANUFACTURER

- A. Membrane Materials:
  - 1. GenFlex TPO.
  - 2. Carlisle TPO.
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 MATERIALS

- A. Membrane: Scrim reinforced, thermoplastic polyolefin sheet (TPO) size per manufacturer's standard sheet size; white.
- B. Thickness, nominal (ASTM D 751): 60 mil.
- C. Flashing: Same membrane as specified above.
  - 1. For vent stacks, pipes, drains, and corners: Prefabricated pipe boots and inside and outside corners provided by manufacturer.
  - 2. Field-fabricated flashing for vent stacks, pipes, drains, and corners utilizing manufacturer's recommended membrane.
- D. Bonding Adhesive: Manufacturer's Bonding Adhesive; use to adhere membrane and flashings to substrates including insulation surfaces, masonry surfaces, plywood, concrete, and metal; DO NOT use bonding adhesive in seams.E. Perimeter Sheets: Same membrane as specified above, sized and located as specified in Part 3.
- F. Primer and Solvent: Use manufacturer's recommended materials.
- G. Insulation:
  - 1. Rigid Board Insulation: Polyisocyanurate roof insulation shall be UL approved; ASTM C1289, Type II, Class I, Grade 3 (25 psi). Insulation shall be approved in writing by the roofing and insulation manufacturer for intended use and for use with the specified roof assembly.
  - 2. Thickness: match existing insulation thickness. (Assume minimum 4" thickness for bidding purposes.)
- H. Tapered Roof Insulation: Polyisocyanurate, tapered panels and standard fill panels composed of a closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber facers, in full compliance with ASTM C 1289, Type II. The tapered system shall provide ¼ inch per foot positive drainage at all roof areas when installed.
  - 1. Crickets: Same material as tapered insulation; slope 1/2 inch per foot.
- I. TPO Coated Metal:
  - 1. Perimeter Edge Flashing: TPO-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. 25 gauge, G90 galvanized metal sheet with a 20 mil unsupported membrane laminated on one side.



- J. Cover Board: A panel composed of moisture resistant gypsum core and fiberglass mat facers, ¼” thick, 48” X 48” or 48” x 96” with a non-asphaltic, heat cured coating.
  - 1. Product: GP Dens-Deck Prime™.
  - 2. National Gypsum DEXcell FA Glass Mat Roof Board.
- K. Insulation and Cover Board Adhesive: Two component or one step polyurethane low-rise adhesive for bonding insulation and cover board to approved compatible substrates.
  - 1. Olympic Olybond500 Adhesive: A two component low-rise polyurethane foam used to attach insulation to approved compatible substrates. Adhesive is applied with a pace cart in bands 12 in. on center. Application rates are typically one gallon per square.
  - 2. Millennium Weather-Tite Adhesive: A one step low-rise polyurethane foam used to attach insulation to approved compatible substrates. Adhesive is applied with a gravity fed applicator or by hand with a dual component caulk gun in bands 12 in. on center.
- L. Insulation and Cover Board Mechanical Fasteners:
  - 1. Approved Manufacturers:
    - a. Rawl Manufacturer, Plastic disc and corrosive resistant coated screws.
    - b. Dekfast; Plastic disc and corrosive resistant coated screws.
    - c. Olympic; Plastic disc and corrosive resistant coated screws.
  - 2. Screw length; The depth of the shiplap substrate varies, the screw length shall be sufficient to engage the substrate a minimum of 3/4 inch.
- M. Miscellaneous Fasteners and Anchors.
  - 1. All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel.
  - 2. Metal types and methods of contact shall be assembled in such a manner as to avoid galvanic corrosion.
  - 3. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins.
  - 4. All concrete fasteners and anchors shall have a minimum embedment of 1¼ inch (32 mm) and shall be approved for such use by the fastener manufacturer.
  - 5. All miscellaneous wood fasteners and anchors used for flashings shall have a minimum embedment of 1 inch (25 mm) and shall be approved for such use by the fastener manufacturer.
- N. Wood Nailers: For treated wood nailers and blocking, see material requirements per Section 06 10 00.

## 2.03 ACCESSORIES

- A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- D. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- E. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- F. Sealants: As recommended by membrane manufacturer.

## PART 3 EXECUTION

### 3.01 GENERAL

- A. Do not deviate from this specification without written approval of the Architect.
- B. Should deviations or changes occur without the manufacturer's approval, the project shall still be eligible for warranty coverage.

### 3.02 EXAMINATION

- A. Verify that surfaces to be bonded to are dry, clean and free of debris.
- B. Verify that the roofing substrate is acceptable to the roofing manufacturer.
- C. Make sure new mechanical curb installation and nailers have been completed.

### 3.03 PREPARATION

- A. Clean top side of decking and existing membrane remaining as required by manufacturer. Protect adjacent finishes from damage.
- B. Install separator sheet at existing built-up roofing as recommended by manufacturer.

### 3.04 WOOD NAILER INSTALLATION

- A. Install continuous wood nailers at perimeter of roof and around roof projections and penetrations as shown on Drawings.
- B. Nailers shall be anchored to resist a minimum force of 300 pounds per lineal foot in any direction. Individual nailer lengths shall not be less than 3 feet long. Nailer fastener spacing shall be at 12 inches on center or 16 inches on center if necessary to match the structural framing. Fasteners shall be staggered 1/3 the nailer width and installed within 6 inches of each end. Two fasteners shall be installed at ends of nailer lengths. Nailer attachment shall meet this requirement and that of the current Factory Mutual Loss Prevention Data Sheet 1-49.

### 3.05 INSULATION AND COVERBOARD INSTALLATION

- A. Handle and secure insulation boards so as to not damage or rupture the face and surface. Cut out damaged areas and replace with structurally sound insulation, properly secured in place.
- B. Install base layer of insulation (flat stock and tapered) or cover board where shown on drawings over existing built-up roof with specified mechanical fasteners as recommended by manufacturer.
  - 1. Installation shall not be less than the recommended FM Global I-90 requirement and as recommended by roofing manufacturer.
  - 2. Place insulation in voids left from removing existing mechanical curbs with a 1/8" seam gap maximum.
- C. Adhesive installation for subsequent insulation layers and cover board (installation may be by means of adhesive or mechanically attached, at roofing installer's option):
  - 1. Apply using pneumatic spray equipment over properly installed and prepared substrates at a rate according to the manufacturer's requirements.
  - 2. Primer may be required prior to application of adhesive if excessive dirt or dust remains on substrate. Contact the Manufacturer for specific primer requirements.
  - 3. Apply adhesive in a smooth, even coating with no gaps, globs, puddles or similar inconsistencies. Only areas that can be made completely watertight in the same day's operations shall be coated.
- D. Verify that positive roof slope exists in all areas.

### 3.06 MEMBRANE INSTALLATION

- A. Fully Adhered Membrane System: Install sheets in accordance with manufacturers recommended procedure using membrane adhesive as recommended by membrane manufacturer .
  - 1. Over the properly installed and prepared substrate surface, adhesive shall be applied using solvent-resistant 3/4 inch (19 mm) nap paint rollers. The adhesive shall be applied to the substrate at a rate according to roof membrane manufacturer's requirements. The adhesive shall be applied in smooth, even coating with no gaps, globs, puddles or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be coated with adhesive. The first layer of adhesive shall be allowed to dry completely prior to installing the membrane.
  - 2. When the adhesive on the substrate is dry, the roof membrane is unrolled. Adjacent sheets shall be overlapped 3 inches. Once in place, one-half of the sheet's length shall be turned back and the underside shall be coated with adhesive at a rate of 1/2 gallon per 100 square feet. When the membrane adhesive has dried slightly to produce strings when touched with a dry finger, the coated membrane shall be rolled onto the previously-coated substrate being careful to avoid wrinkles. Do not allow adhesive on the underside of the roofing membrane to dry completely. The amount of membrane that can be coated with adhesive before rolling into substrate will be determined by ambient temperature, humidity and crew. The bonded sheet shall be pressed firmly in place with a minimum 100 lb (45 kg) steel, membrane roller, by rolling in two directions.

3. The remaining un-bonded half of the sheet shall be folded back and the procedure repeated.
  - a. The Applicator shall count the amount of pails of adhesive used per area per day to verify conformance to the specified adhesive rate.
  - b. Do not install when air temperature is within 5° of dew point.
  - c. No adhesive shall be applied in seam areas. All membranes shall be applied in the same manner.
  - d. Hot-air weld overlaps according to the manufacturer's requirements. Seam test cuts shall be taken at least 3 times per day.
4. Securement at Roof Perimeter and around Rooftop Penetrations:
  - a. Around all perimeters, at the base of walls, drains, curbs, vent pipes, or any other roof penetrations, adhere the membrane with the recommended adhesive and according to the manufacturer's instructions.
  - b. Manufacturer shall confirm that no mechanical fasteners are required to secure perimeter.
- B. Seaming (Ensure both mating surfaces are free of debris and no moisture is present on the splicing surfaces):
  1. Position the top membrane to overlap the bottom membrane.
  2. Thoroughly clean an area on both sheets at least 4 inches wide if seam area has become contaminated with dirt, debris, etc.
  3. Using an approved automatic heat welding machine or hand held heat gun and Teflon roller, continuously weld a minimum seam. Only approved Automatic Walker Welders shall be used to weld all field seams.
- C. Flashing:
  1. Perimeter wall flashing, flashing around vents, and miscellaneous roof projections must be installed using TPO membrane, and TPO pre-molded corners and pipe boots.
  2. TPO un-reinforced flashing is only to be used at inside and outside corners and field wrapped pipe boots and NOT to be used as a general purpose flashing.
- D. Night Seal:
  1. At the completion of each day's work, temporarily seal any loose edge of membrane with Night Seal. Care must be used to guarantee that no water flows beneath any completed sections of roof. Consult manufacturer's standard detail for method of attachment. Night Seal must be cut out and discarded prior to resumption of work.
- A. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and the manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.
- B. Adhesive for Membrane Flashings
  1. Over the properly installed and prepared flashing substrate, adhesive shall be applied according to the manufacturer's instructions. The adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
  2. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.
- C. All flashings shall extend a minimum of 8 inches (0.2 m) above roofing level unless otherwise accepted in writing by the Owner's Representative and the manufacturer.
- D. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place.
- E. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with manufacturer's termination bar at 6-8 inches (0.15-0.20 m) on center.
- F. Coated flashings shall be terminated according to the manufacturer's recommended details.

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- G. All flashings that exceed 30 inches (0.75 m) in height shall receive additional securement per the manufacturer's requirements.

**3.08 METAL FLASHINGS**

- A. Metal details, fabrication practices and installation methods shall conform to the applicable requirements of the following:
  - 1. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
  - 2. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - latest issue.
- B. Complete all metal work in conjunction with roofing and flashings so that a watertight condition exists daily.
- C. Metal shall be installed to provide adequate resistance to bending to allow for normal thermal expansion and contraction.
- D. Metal joints shall be watertight.
- E. Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the wood nailer a minimum of 1 inch (25 mm).
- F. Airtight and continuous metal hook strips are required behind metal fascias. Hook strips are to be fastened 12 inches (0.3 m) on center into the wood nailer or masonry wall.
- G. Counter flashings shall overlap base flashings at least 4 inches (100 mm).
- H. Hook strips shall extend past wood nailers over wall surfaces by 1½ inch (38 mm) minimum and shall be securely sealed from air entry.

**3.09 FIELD QUALITY CONTROL**

- A. Seam Tests: Probe the entire lap edge of each seam with an approved seam probing tool after seam has cooled completely to verify seam consistency. Probing before the seam area has cooled will damage the membrane.
- B. Field Service: Upon completion of the installation, have the manufacturer's representative make an inspection to ascertain that the roofing membrane system has been installed according to manufacturer's approved specifications and details.
- C. Warranty Inspection: Provide manufacturer's inspection for acceptance for warranty.
- D. Rejection of Defective Work: Areas having excessive patching as a result of damage to the membrane or faulty installation may be rejected by roof membrane or the Architect; replace the membrane completely in these areas.

**3.10 PROTECTION AND CLEANING**

- A. Protect membrane in progress and completed membrane from foot traffic.
- B. Clean soiled surfaces, remove trash and debris, and leave project site in a clean condition.

**END OF SECTION**