

## ADDENDUM # 01

MPL Project Number: MPL-19-008  
QA Project Number: 19026.00  
Date: 10/16/2019



### Project Name

Milwaukee Central Library  
Multi-Level Roof Replacement  
814 W. Wisconsin Ave.  
Milwaukee, WI 53233

This addendum forms a part of the Contract Documents and modifies the original Contract Documents dated **10/03/2019**. Acknowledge receipt of this Addendum by inserting the number and issue date of this addendum in the blank space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

Bidders are responsible for inserting documentation contained within this Addendum into their originally issued Bid Documents. This document supersedes previously issued bid documents.

### **This Addendum consists of the following modifications and attachments:**

1. Bidder Walk-Through Attendee List – Dated 10/15/2019
2. Revised Specification Section: 07 13 53 - Elastomeric Sheet Membrane

### **SECTION 07 13 53 – ELASTOMERIC SHEET MEMBRANE**

#### **1. Part 2 – Products, 2.2 Acceptable Manufacturers:**

- Item A. Remains “Sika Sarnafil”, as originally noted.
- Item B. “Carlisle Syntec Systems” has been added as an acceptable manufacturer.
- Item C. Now reads “No Substitutions”.
- Item D. Now reads “Roofing Contractor must be and Approved Applicator of one of the listed Manufacturers.”
- Item E. Has been added and now reads “Other miscellaneous material manufacturers as listed below.”

#### **2. Part 2 – Products, 2.3 Base Layer / Vapor Retarder:**

- Item A. Product: Revised to read: “Sarnafil Sarnavap SA Air & Vapor Barrier (or approved Carlisle equivalent)”.
- Item E. Primer  
Line 2.: Revised to read: “Sarnafil Vapor Retarder Primer SB (or approved Carlisle equivalent)”.

#### **3. Part 2 – Products, 2.4 Sheet Waterproofing:**

- Item A. Manufacturer  
Line 2.: Revised to add the Manufacturer: “Carlisle”.

**END OF ADDENDUM #01**

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Milwaukee Public Library  
 Central Library Multi-Roof Replacement Project  
 814 W. Wisconsin Ave.  
 Milwaukee, WI 53233

Quorum Project Number: 19026.00  
MPL Project Number: MPL-19-008



Owner Contact: Armando Chacon - Library Facilities Manager 414-286-8798  
 Quorum Architects Contacts: Brian Kobasick / Brian Scotty 414-265-9265  
 Meeting Date: 10/15/2019  
 Time: 10:00am  
 Location: Meet in First Floor Rotunda

Sign-In Sheet

### Attendee Sign-In Sheet

<u>Name:</u>	<u>Entity:</u>	<u>Phone:</u>	<u>Email:</u>
Brian Kobasick	Quorum Architects	414-265-9265	bk@quorumarchitects.com
Josh Thull	JRT	262-442-8136	jrt@jrttopnotchroofs.com
Tom Bahr	JRT	262-442-8148	tom@jrttopnotchroofs.com
STEVE STUCKER	FJAC	414-445-4141	SSTUCKER@CHRISTIANSON ROOFING.COM
TODD SAMUEL	FJAC	414-788-2562	TSAMUEL@
Jake Tarantino	Schranz	414-358-3100	jake@schranzroofing.com
MATT LEMPKER	HOLTON	(262)377-7887	MATT@HOLTONBROTHERS.COM
Doug Biggar	Langer Rfy	414-476-5800	dbiggarr@langer-roofing.com
Mike HERNESMAN	BUILDING COMPANIES	608 516 8623	BEINCC@CHARTER.NET
Armando Chacon	Milwaukee Public Library	414-268-8798	ArChaco@milwaukee.gov



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SECTION 07 13 53  
ELASTOMERIC SHEET MEMBRANE

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. PVC sheet membrane waterproofing – field and flashings.
  - 2. High density gypsum coverboard
  - 3. Polyisocyanurate Insulation
  - 4. Adhesives
  - 5. Miscellaneous Accessories
  - 6. Roof Drains
  - 7. Sheet Metal Overflow Scuppers
  - 8. Sheet Metal Coping Caps
  - 9. Sheet Metal Counter-flashings

1.3 PREINSTALLATION MEETINGS

- A. Pre-Installation Conference: Conduct Conference at Project Site
  - 1. Review project including removal of existing roof assembly, preparation of underlying structural substrate, scope of new installation procedures, testing and inspection procedures, etc.

1.4 ACTION SUBMITTALS

- A. Product Data
  - 1. Data sheets for all primary products to be used including description, tested physical and performance properties, storage information and other pertinent data.
  - 2. Manufacturer's written installation instructions.
- B. Shop Drawings
  - 1. Drawings of any detail that was not included in the specification package or will vary from a detail shown in the specification package.
  - 2. Tapered insulation layout from manufacturer.
  - 3. Coping Caps
- C. Samples
  - 1. 8" x 8" Sample of Waterproofing Membrane
  - 2. Sheet Metal samples showing gauge and finish

1.5 INFORMATIONAL SUBMITTALS

- A. Letter from manufacturer stating contractor is an approved applicator
- B. Sample warranty document from manufacturer

1.6 QUALITY ASSURANCE

- A. Contractor shall employ installers and supervisors who are trained and approved by the manufacturer.

1.7 FIELD CONDITIONS

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- A. Environmental Limitations
  - 1. Apply materials only within manufacturer-accepted range of ambient and surface temperatures.
  - 2. Do not apply materials over damp or wet substrate
  - 3. Do not apply materials during periods of precipitation.

1.8 GENERAL DESIGN CRITERIA

- A. All new roof assemblies shall comply with the City of Milwaukee and State of Wisconsin building codes, ordinances, rules or regulations.
- B. All materials furnished and installed shall meet or exceed the listed ASTM or Federal Specifications.
- C. All work shall conform with the roof system manufacturer's installation instructions and requirements.
- D. The roof assembly shall have been tested by Underwriter's Laboratories (UL) and Factory Mutual (FM) for the application herein specified and meet the following requirements:
- E. Wind Uplift Resistance
  - 1. Roof Assembly:

<u>Roof Area</u>	<u>Field</u>	<u>Perimeter</u>	<u>Corner</u>
9A & B, 11,			
17, 18, 19	FM 1-60	FM 1-90 (4')	FM 1-120 (4' x 4')
5	FM 1-75	FM 1-120 (4')	FM 1-180 (8' x 8')
  - 2. Roof Edge Systems:  
ANSI/SPRI FM 4458, ES-1  
FM 1-49
- F. Fire Resistance Classification  
Roof Assembly: (UL) Class "A"

1.9 WARRANTY

- A. Manufacturer
  - 1. 20-Year
  - 2. Total System Warranty covering all materials and labor supplied by the manufacturer
  - 3. Warranting against leaks and manufacturer's defects
  - 4. Non-Prorated
  - 5. Transferable
- B. Contractor
  - 1. 5-Year
  - 2. Workmanship Guarantee
  - 3. Guarantee against leaks and other failures
  - 4. Covering conditions not covered by the manufacturer's warranty

PART 2 – PRODUCTS

2.1 MATERIALS – GENERAL

- A. Source all new roof system materials from a single manufacturer

2.2 ACCEPTABLE MANUFACTURERS

- A. Sika Sarnafil

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- B. Carlisle Syntec Systems
- C. No Substitutions
- D. Roofing Contractor must be an Approved Applicator of one of the listed Manufacturers
- E. Other miscellaneous material manufactures as listed below

2.3 BASE LAYER / VAPOR RETARDER

- A. Product: Sarnafil Sarnavap SA Air & Vapor Barrier (*or approved Carlisle equivalent*)
- B. Rubberized asphalt laminated to a polyethylene film.
- C. Application
  - 1. Prior to adhering, prime substrate (*See Below*).
  - 2. Self-adhered directly over concrete deck without voids or wrinkles.
  - 3. Begin at low points and work upslope.
  - 4. Lap all edges a minimum of 2 ½" downslope.
  - 5. Roll immediately after installation with 100-150 lb roller.
  - 6. Incorporate 2" long bead of lap sealant internally along T-joints & step-offs.
  - 7. Turn up vertical planes a minimum of 3" or as required to create water tight condition.
  - 8. Leave and maintain in watertight condition until covered
  - 9. Vapor retarder may not be left exposed for greater than 7 days.
- D. Physical Properties
  - 1. Thickness: 40 mils
  - 2. Tensile Strength 200 psi ASTM D412
  - 3. Elongation 200% ASTM D412
  - 4. Pliability -15°C ASTM D146
  - 5. Peel Adhesion 5 lb/in ASTM D903
  - 6. Puncture Resistance 20 lb ASTM E154
  - 7. Permeability 0.05 perms ASTM E96
- E. Primer
  - 1. Contact adhesive/primer – rubber/solvent blend
  - 2. Sarnafil Vapor Retarder Primer SB (*or Carlisle equivalent*)
  - 3. Spray-applied according to manufacturer's approved application rates.  
(83-138 sq. ft./lb)
  - 4. Allow to dry prior to adhering membrane (typically 5 minutes)
  - 5. VOC Content 500 g/L
  - 6. Non-flammable when dry

2.4 SHEET WATERPROOFING

- A. Manufacturer:
  - 1. Sarnafil
  - 2. Carlisle
- B. System: Single-Ply Thermoplastic
- C. Material: Polyvinyl Chloride with Fiberglass Reinforcement (PVC)
- D. Thickness: 60 mil (*Minimum – Not Nominal*)
- E. Color: White
- F. Application: Fully Adhered
- G. Physical Properties:
  - 1. Meeting Standard Specification for PVC Sheet Roofing ASTM D4434
  - 2. Sheet Width 10' minimum
  - 3. Weight: 0.434 lb/ft<sup>2</sup>
  - 4. Thickness over scrim: 30 mil ASTM D4434
  - 5. Tensile Strength: 1550 psi ASTM D638
  - 6. Tear Resistance: 17.5 lbf ASTM D1004
  - 7. Elongation at Break – MD/CD: 250%/220% ASTM D638

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- |     |   |            |               |
|-----|---|------------|---------------|
| 8.  | Linear Dimensional Change – CD:         | -0.02%     | ASTM D1204    |
| 9.  | Resistance to Water Absorption          | 1.8%.      | ASTM D570     |
| 10. | Puncture Resistance - Static:           | >33 lbf    | ASTM D5602-98 |
| 11. | Puncture Resistance - Dynamic:          | 7.3 ft-lbf | ASTM D5635-04 |
| 12. | Energy Star initial solar reflectance:  | 0.87       | Reflectometer |
|     | Energy Star solar reflectance – 3 years | 0.61       | Reflectometer |
| 13. | CRRC initial solar reflectance:         | 0.87       | ASTM C1549    |
| 14. | CRRC initial thermal emittance:         | 0.95       | ASTM C1371    |
| 15. | Leed thermal emittance:                 | 0.94       | ASTM E408     |
| 16. | Solar Reflectance Index (SRI)           | 110        | ASTM E1980    |
- H. Seaming Method
1. 2”-3” Lap
  2. Hot Air Welding – Automatic Welding Machine
  3. Hand held welders may only be used where the logistics to not allow the use of automatic welding machine. Follow hand welding with a 2” silicone roller.
  4. Minimum 1 ½” Wide Weld
  5. Welding equipment shall be provided by the manufacturer
  6. 1/8” bead of sealant applied to cut edges
  7. All seams situated downslope
  8. No seams within 4’ of drains
  9. All completed seams to be inspected/probed for continuity
  10. Field Seam Strength (% of Tensile Strength): 75 (ASTM D638)
  11. 4” round reinforcement patches applied to all T-joints & inside/outside corners.
- I. Special Flashing Membrane
1. Non-reinforced PVC
  2. Used for pipe wraps, T-joint reinforcement, inside/outside corners & stripping plies.
  3. Nominal thickness 30 mil
  4. Tensile Strength 1500 psi ASTM D638
  5. Elongation 200% ASTM D638
  6. Tear Strength 10 lbf/in ASTM D1004
- J. Membrane Adhesives, Cleaners, Solvents, Etc.
1. Supplied and/or approved by the membrane manufacturer
  2. Applied according to the manufacturer’s installation instructions

## 2.5 INSULATION

- A. Coverboard
1. Glass mat reinforced, water resistant, gypsum board with non-asphaltic integral surface treatment.
  2. Manufacturer’s Product: Georgia Pacific – Dens Deck Prime
  3. Supplier: Roof Membrane Manufacturer
  4. Board Size: 4’ x 8’ rigid boards.
  5. Thickness: ¼”
  6. Meeting the following Physical Properties:
 

a.	R-value	0.28
b.	Compressive Strength	500 psi
c.	Fire Classification	FM Class 1, UL Class A
d.	Flame Spread (ASTM E 84)	0.0
e.	Maximum Moisture Absorption (ASTM C 473)	10%
- B. Insulation
1. Polyisocyanurate with medium fiberglass facer
  2. Supplied and/or approved by membrane manufacturer
  3. Board Size: 4’ x 8’ rigid boards.
  4. Thickness:
 

a.	Flat Stock (Sloped Decks)	2 layers of 2.6”
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- b. Tapered (Flat Decks) ¼":12" (Average R-Value of 30)
  - 5. Meeting the following Physical Properties:
    - a. R-value (LTTR) 5.7/in
    - b. Minimum Compressive Strength 20 psi
    - c. Minimum Density 2 pcf
    - d. Flame Spread (ASTM E84) < 50
    - e. Maximum Moisture Absorption 1%      ASTM C209
    - f. CFC Free
- C. Tapered Saddles
  - 1. Polyisocyanurate
  - 2. Slope: ½":12"
  - 3. Meeting physical properties listed above.
  - 4. Used to replace existing lightweight concrete saddles.
  - 5. Match existing saddle layout – adapt as required to promote drainage
  - 6. Exact layout may not be able to be determined until the roof assembly is removed.
- D. Edge Strips
  - 1. Wood Fiberboard
  - 2. 18" Wide – Tapered
  - 3. Used as required to create sumps at drains.
- E. Stagger all insulation board joints of separate layers. Offset joints of boards within the same layer. There shall be no gaps between insulation boards greater than ¼"
- F. Storage of insulation prior to use shall be on raised pallets, covered with a waterproof tarp. Slice shrink-wrap in which insulation was delivered to alleviate condensation. Broken or damp insulation may not be used.

2.6 INSULATION ADHESIVE

- A. For attaching insulation and coverboard.
- B. Supplied/Approved by membrane manufacturer
- C. Product: Olybond 500 BA (*or equivalent*)
- D. Low-rise, two-component polyurethane expanding foam adhesive.
- E. Physical Properties
 

1. Mixed Ratios by Volume	1:1	Part A to Part B
<ul style="list-style-type: none"> <li>a. Part A: Polymeric Isocyanate</li> <li>b. Part B: Polyols, Surfactants &amp; Catalysts</li> </ul>		
2. Viscosity – Part A	225 CPS	(@ 25°C)
Viscosity – Part B	275 CPS	(@ 25°C)
3. Avg. Net Weight – Part A	10.32 lbs/gallon	
Avg. Net Weight – Part B	8.54 lbs/gallon	
4. Water Absorption	5.1%	ASTM D2843
5. Closed Cell Content	90%	ASTM D2856
- F. Application
  - 1. Do not apply during temperatures below 45°F.
  - 2. Apply in parallel rows of beads ½" to ¾" in width using manufacturer supplied/approved cart at the following spacing
    - a. Field: 12"
    - b. Perimeter: 6"
    - c. Corner: 4"
    - d. Meeting wind uplift requirements listed above in General Design Criteria at the listed field, perimeter and corner regions.
    - e. Add rows of beads as required to ensure that all board edges are adhered tightly to the substrate.
  - 3. Place insulation boards in place after allowing beads to rise to ½" to ¾" to develop "string body" but not yet "tack free".

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4. Walk and roll boards in place using a 150lb roller.
  5. Install 1 layer of insulation at a time. Allow to set before proceeding to subsequent layers
  6. Pull tests will be conducted at the beginning of the project to confirm satisfactory uplift resistance.
- G. Storage: Maintain temperature of stored material above 55°F.

2.7 LIQUID FLASHINGS

- A. Supplied/approved by membrane manufacturer
- B. Waterproof Coating
  1. 2-Component
  2. Polymethyl Methacrylate (PMMA)
  3. Color – White
  4. 55 mil base application. 25 mil Finish application
- C. Fabric Reinforcement
  1. Fleece
  2. Embedded in base coat of waterproof coating

2.8 SHEET METAL ITEMS

- A. Termination Bars
  3. 1 3/4" Deep x 1/8" thick extruded aluminum.
  4. Pre-punched & fastened 6" o.c.
  5. Lip to receive caulk.
  6. Installed across the top edge of all flashings on vertical planes.
- B. Coping Caps
  1. Meeting ANSI/SPRI, FM 4458 ES-1
  2. Supplied/accepted by Membrane Manufacturer
  3. .040 Pre-Finished Aluminum Snap-On Cap – 12' sections.
  4. 22 Ga. Galvanized Steel Cleats – 12" wide
  5. Cleats spaced 4' o.c. & fastened with 2 anchors per side.
  6. Incorporate 8" wide concealed splice plates with caulk tape.
  7. Incorporate all necessary miters, end caps and transition pieces.
  8. Fascia extender with continuous cleat fastened 12" o.c. as required to extend past wood blocking and lap onto wall cladding a minimum of 3".
- C. Counterflashing
  1. Masonry Walls:
    - a. 2-Piece, Reglet-Mounted Design
    - b. Receiver with 1" leg inserted into new saw-cut reglet.
    - c. Caulk top edge of reglet.
    - d. 6" Fascia – snap design into receiver
    - e. 10' Sections
  2. Metal Panel Walls & Curbs:
    - a. 1-Piece, Slip-Mounted Design
    - b. Fastened 12"-18" o.c.
    - c. 4" Fascia
  3. .040 pre-finished aluminum.
  4. Incorporate all necessary end pieces and miters.
  5. 2" laps at adjoining sections.
- D. Gutters
  1. Installed at existing locations.
  2. Refer to section details for design and dimensions
  3. .050 pre-finished aluminum.
  4. Sealant within all seams.
  5. 2" wide x 0.10 mill finished aluminum Gutter straps @ 18" o.c.
  6. 2" x 0.125 mil finished aluminum Support brackets @ 30" o.c.
- E. Downspouts
  1. Installed at existing locations.

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2. Refer to section details for design and dimensions
  3. .040 pre-finished aluminum.
  4. Open face
  5. Support brackets spaced no greater than 10' o.c.
  6. Attached to gutters with 4" flanged sleeve.
- F. Overflow Scuppers:
1. Installed where indicated on roof plan.
  2. Remove brick masonry as required to achieve 12" wide by 6" high opening.
  3. Add wood blocking at base of opening to achieve minimum 3" height above finished roof surface.
  4. PVC Coated, 26 Ga. Steel – Supplied by membrane manufacturer
  5. Sleeve – 6" x 12" x wall depth (Opening lined with PVC prior to inserting metal sleeve).
  6. Exterior Frame – Finished hem around scupper opening.
  7. Flanges set against flashing in water cut-off mastic & fastened 3" o.c. Strip-in flanges with 6" wide PVC flashing ply.
  8. Refer to section detail.
- G. Other miscellaneous sheet metal items as called out on section details

2.9 PLUMBING

- A. Roof Drains
1. All existing roof drains will be replaced including the vertical conductor and first elbow.
  2. Manufacturer: J. R. Smith (*Or Approved Equivalent*)
  3. Cast Iron Drain Bowl, Clamping Ring & Strainer
  4. Cast aluminum, epoxy coated gravel guard & clamping ring.
  5. Conductor opening to match existing size
  6. Seal to existing conductor with new lead and oakum caulking
  7. Installed by licensed plumber.

2.10 MISCELLANEOUS

- A. Plywood
1. As required to replace existing plywood on the inside of the parapet walls.
  2. CD-X
  3. 3/4" Thick
  4. Attached to inside of parapet walls with masonry anchors and 2" stress plates.
- B. Pre-Fabricated Pipe Flashing:
1. Supplied and approved by membrane manufacturer
  2. Utilized for pipes up to 6" wide.
  3. Clamp and caulk top edge.
  4. Installed according to manufacturer's requirements.
- C. Pipe/Conduit/Condensate Supports
1. Miro Industries Inc. (*or approved equivalent*)
  2. Pre-Fabricated supports for any type of conduit or piping running across the roof including condensate lines.
  3. Polycarbonate Bases
  4. Steel Supports
  5. Utilize appropriate type and size of stand to accommodate item being supported.
    - a. Miro Strut Pipe Support System for heavier piping/conduits
    - b. Miro Fixed Pipe Stands for lighter conduits, condensate lines, etc.
    - c. Meeting required weight capacity.
  6. Wood blocking will not be acceptable
- D. Walkway Pads:
1. Supplied and approved by membrane manufacturer
  2. White with yellow caution lines along edges.
  3. Diamond pattern tread.

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4. Installed where indicated on roof plan.
  5. Installed at the base of all doors, stairs, ladders and access points
  6. Installed at the base of all downspouts.
  7. Installed completely around all rooftop units.
  8. Set below all items loose laid on the roof.
  9. Additional walkway pads may be requested by owner.
- E. Pourable Sealer:
1. Black, 2-component, polyurethane based sealant.
  2. Used to fill pitch pans.

PART 3 – EXECUTION

3.1 REMOVAL, DISPOSAL, PREPARATION

- A. Traffic paths over existing roofs that are not a part of the project work should be avoided. If absolutely necessary, those paths must be lined with plywood and insulation boards. Materials and equipment must not be stored on non-work areas.
- B. On a daily basis the contractor shall familiarize himself with the areas below which he will be working and take note of any special conditions that need to be addressed.
- C. Remove and dispose of all existing roofing materials (pavers, membrane, insulation, sheet metal items) down to the structural steel deck. Dispose of refuse materials as required by Federal, State and Local ordinances and codes. Convey materials directly to dumpsters by means of enclosed chutes or a crane box.
- D. It is anticipated lightweight concrete saddles, if present, will need to be removed and disposed of due to being in a deteriorated state. The project should be bid under that assumption. However, contractor should examine saddles when removed. If saddles appear to be in satisfactory condition it should be brought to the attention of the Consultant. If saddles can be left in place and reused a credit will be negotiated.
- E. Extend existing soil stack pipes to a minimum height of eight inches (8") above the finished elevation of the new roof assembly. Provide cast iron pipe, or PVC pipe (as required to match existing) and FernCo type couplings to provide mechanical attachment to the existing vent pipes.
- F. If metal wall panels are not high enough to achieve a 12" flashing height they must be trimmed and raised.

3.2 TEMPORARY ROOF / BASE PLY / VAPOR RETARDER

- A. Broom clean / vacuum surface of roof to remove any loose debris.
- B. Spray-apply primer over entire roof deck and base of walls at manufacturer-recommended rate. Allow to dry thoroughly.
- C. Install self-adhering vapor retarder over entire primed roof deck. Lap all seams downslope 2 ½". Go over with steel roller to ensure solid bond. Avoid wrinkles, voids and irregularities.
- D. Turn vapor retarder up all vertical transitions at least 3".
- E. Apply bead of sealant along seams and at the top edge of vertical transitions.
- F. Maintain temporary roof in a watertight condition until new roof system is installed.

3.3 ROOF DRAINS

- A. All existing roof drains, vertical conductors and initial elbows will be removed and replaced with new.

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- B. Install new cast iron roof drain assembly – match existing size.
- C. Make all plumbing reconnections including sealing to existing conductor with lead and oakum caulking.
- D. Incorporate new stainless steel strainer and hardware.
- E. Patch existing concrete deck around drains as required.
- F. All plumbing work must be performed by licensed plumber.

3.4 INSULATION

- A. Install tapered or flat stock polyisocyanurate insulation over the temporary roof.
- B. Overlay insulation with tapered polyisocyanurate saddles where indicated on roof plan and/or required.
- C. Create 48" x 48" sump at all drains to promote the evacuation of water.
- D. Along the gutter of area 18 transition from 2 layers of flat stock to 1 layer of flat stock and a 4' wide tapered board to promote drainage to gutter.
- E. After roof deck is exposed it may be necessary to adapt to the saddles to properly drain water from the roof surface. NOTE: Ponding water in excess of 48 hours will not be acceptable. Contractor must bring any concerns with the condition of the substrate to the Consultant to determine proper methods for addressing.
- F. Overlay the polyisocyanurate with 1/4" Dens Deck Prime Coverboard.
- G. Offset board edges within the same layer. Stagger all board joints of separate insulation layers.
- H. Allow no gaps between boards greater than 1/4". Butt tightly against perimeter, walls, parapet walls and curbs.
- I. Discard broken boards.
- J. Adhere all insulation boards, saddles and coverboard in polyurethane foam adhesive according to the following minimum rates. Narrow as required to meet specified wind uplift requirements:
  - 1. Field: 12" Bead Spacing
  - 2. Perimeters: 6" Bead Spacing
  - 3. Corners: 4" Bead Spacing
- K. Create 48" wide drain sumps. Utilize tapered polyisocyanurate and/or tapered wood fiber edge strips. Taper to height of base of drain head.

3.5 MEMBRANE INSTALLATION – FIELD & FLASHING

- A. Field Layout / Adhesion
  - 1. Fully adhere new PVC membrane over the new coverboard bed in a solid application of bonding adhesive. Apply the adhesive according to the manufacturers approved procedures and application rates.
  - 2. Every attempt must be made to avoid wrinkles and voids. If the Consultant determines that any section of membrane is excessively wrinkled the contractor will be required to replace that section.
  - 3. At the base of vertical transitions the field membrane should be turned up the vertical plane as shown on section details. Secure the field membrane with appropriate fasteners and 2" barbed low profile metal seam plates, or anchor bars, at a rate of 12" o.c
- B. Seams
  - 1. Minimize seams.
  - 2. Wherever possible, situate seams downslope.
  - 3. Clean and dry edges of membrane prior to welding.

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4. Lap all seams as required by manufacturer. All seams shall be hot air welded. Weld at temperature and speed as recommended by the membrane manufacturer in conjunction with the automatic heat welding machine manufacturer.
  5. Hand welders may be utilized where the logistics do not allow the use of automatic welding machines.
  6. Seams must be probed to insure adequate bond.
  7. Test cuts of seams may be taken periodically.
  8. Incorporate all necessary "T" joint reinforcement patches.
  9. As required apply 1/8" bead of PVC sealant to all cut edges with exposed reinforcement scrim
- C. Drain Flashings
1. Extend PVC field membrane into drain sumps.
  2. Incorporate a solid application of water cut-off mastic below the membrane within the sump region.
  3. Extend the membrane past the drain clamping ring and drain bolts at least 1/2". Do not extend into the drain bowl to a point where the diameter of the PVC opening is less than the downspout.
  4. Tighten clamping ring. Replace any missing or damaged bolts.
- D. Wall & Curb Flashings
1. Adhere a separate ply of PVC flashing membrane to all vertical substrates in bonding adhesive.
  2. All flashing membrane must make a clean turn at the base of the vertical transition.
  3. Crease the membrane as required to avoid any bridging. Adhere over the fasteners and seam plates of the field membrane.
  4. Extend out onto the horizontal plane of the roof field a minimum of 4". Hot air weld to field membrane.
  5. At parapet walls adhere the flashing up and over the wall so that the wood blocking is completely covered. Temporarily secure.
  6. At masonry walls adhere the flashing up the walls a minimum of 12".
  7. At metal panel walls adhere the flashing to the underside of the metal panels.
  8. At the top edge of all flashings terminated on the vertical plane Incorporate water cut-off mastic behind the top edge of the flashing.
  9. At unit curbs adhere the flashing up onto the top of the curb.
  10. Completely line overflow scupper openings with PVC on both sides, top and bottom. After metal sleeve is installed-strip in flanges with 6" wide PVC flashing ply.
  11. Incorporate reinforcement patches at all inside and outside flashing corners.
  12. Secure the top edge of all flashings on vertical planes with an extruded aluminum termination bar fastened 6" o.c.
- E. Penetration Flashings
1. Where appropriate, flash round penetrations with pre-fabricated boots. Weld boots to surface of PVC. Secure top of boot with clamp. Caulk top edge.
  2. Flash vent stacks, pipes, round posts, etc. with non-reinforced PVC flashing field wrap. according to manufacturer's requirements, including the structural support posts on top of the parapet walls and the lighting support posts on the small curbs.
  3. Where necessary, flash non-curbed conduits and other round items with pre-fabricated pockets. Weld to membrane. Fill with pourable sealer. Ensure minimum 2" clearance between penetration and side of pocket.

3.6 SHEET METAL ITEMS

- A. Coping Caps
1. Install new coping caps on parapet walls.
  2. Fasten each 12" wide clip with 4 fasteners. Clips will be spaced 4' o.c.
  3. Snap-on 12' long covers.
  4. Incorporate 8" wide splice plates with factory-applied caulk tape.
  5. Incorporate all necessary miters, end and transition pieces.

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6. As required, install coping fascia extender with continuous cleat fastened 12" o.c. to lap over wall cladding 3" past wood blocking.
- B. Counterflashing
1. Masonry Walls
    - a. Saw cut reglet into mortar joint above flashing membrane on masonry walls.
    - b. Insert receiver into reglet.
    - c. Caulk top edge of receiver.
    - d. Attach sheet metal counterflashing fascia into receiver.
    - e. Incorporate all necessary miters, end pieces and transition pieces.
  2. Metal Panel Walls
    - a. Install slip mounted counterflashing behind metal wall panels.
    - b. Fasten 12" o.c. through panels.
    - c. Incorporate all necessary miters, end pieces and transition pieces
  3. Curbs
    - a. Slip mount counterflashing behind caps.
    - b. Fasten 12" o.c.
- C. Overflow Scuppers
1. 12" W x 6" high openings will have been previously cut through the parapet walls. Openings will be cut at a point located 3" above the finished roof surface.
  2. Line scupper opening with PVC flashing. Incorporate corner reinforcement patches to create watertight condition.
  3. Insert flanged sleeve fabricated from PVC coated metal.
  4. Press interior flanges against flashing in water cut-off mastic & fasten 3" o.c.
  5. Strip-in interior flanges with 6" wide PVC flashing plies. Weld edges.
  6. Exterior face will have hemmed edges to create finished appearance.

3.8 FINISHING

- A. Install walkway pads around HVAC units and at the base of access ladders. Tack-weld walkway pads to membrane per manufacturer's requirements.
  - B. All free-standing items on the roof will be set on protective walkway pad material supplied by membrane manufacturer
  - C. Place all piping, conduits, HVAC drainage lines, condensate lines, etc. on Miro supports. Utilize appropriate Miro product for item being supported. Supports shall be spaced no greater than 5' on center. Reduce spacing as required to adequately support lines and prevent deflection. Set supports on membrane slip sheet.
  - D. Reinstall all temporarily removed equipment, conduits, electrical lines and lighting. All must be returned to full operation.
  - E. New membrane is intended to be white and to meet the specified reflectivity standards. Some discoloration and markings are to be expected within reason. However, the Contractor is expected to take precautions to maintain the cleanliness and color of the membrane. As deemed appropriate, the Consultant will exercise his right to request that the Contractor power wash and/or clean the membrane with manufacturer-approved methods and chemicals to restore the roof to its intended, white appearance.
  - F. Clean field surface, walls, fascia and other areas of any excessive adhesive spills, etc.
  - G. At the end of each workday ensure that the new membrane is adequately tied off to prevent water infiltration. Situate all loose field edges down slope. Temporarily adhere to existing adjoining membrane with flexible pourable sealer. Thoroughly embed membrane and check that continuous contact is made. On the next workday, peel open seam and trim off section where the sealer was applied.
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