SECTION 07513 – MODIFIED CAP SHEET SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
1. Roof removal and replacement with designated underlayments, insulations, and white cap sheet system.
2. Existing roof system includes a built up roof assembly – installed over wood decking.
3. New roof system will include a nailed base sheet to the wood deck, a ½" wood fiber insulation, three (3) plies of fiberglass felt and modified cap sheet assembly.
4. Roof system will include a 20 Year NDL Warranty from the manufacturer.
5. Manufacturer’s representative shall make on site visits three (3) days a week for the duration of the project.

1.3 PERFORMANCE REQUIREMENTS
A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
C. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that comply with requirements in FM Approvals 4470 as part of a membrane roofing system, Identify materials with FM Approvals markings.

1.4 QUALITY ASSURANCE
A. Manufacturer Qualifications: A qualified manufacturer that has UL listed and FM Approvals approved for membrane roofing system consistent to that used for this Project. Manufacturer shall inspect work in progress 3 days each week for the duration of the project.
B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

C. Source Limitations: Obtain components including roof insulation, fasteners, adhesive, and etc. as approved by membrane roofing manufacturer.

D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

E. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
   5. Review structural loading limitations of roof deck during and after roofing.
   6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
   7. Review governing regulations and requirements for insurance and certificates if applicable.
   8. Review temporary protection requirements for roofing system during and after installation.
   9. Review roof observation and repair procedures after roofing installation.

F. Preinstallation Roofing Conference: Conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.7 WARRANTY

A. Manufacturer's 20 Year NDL Warranty.

PART 2 - PRODUCTS

2.1 BUILT-UP ROOFING MANUFACTURERS

A. Basis of Design: Subject to compliance with requirements, provide products by the following:

2.2 BASE-SHEET MATERIALS

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

1. GLASS BASE FELT

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaking Strength @ 73.4°F min – Longitudinal</td>
<td>79 lbf/in</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>Breaking Strength @ 73.4°F min – Transverse</td>
<td>62 lbf/in</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>Pliability 90° Around, 1” Mandrel @ 77°F (pass/fail)</td>
<td>Pass</td>
<td>ASTM D 4601 Type II</td>
</tr>
<tr>
<td>Net Dry Mass – Coated Sheet min (lb/100 ft²)</td>
<td></td>
<td>ASTM D 228</td>
</tr>
<tr>
<td>Average of Rolls</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Individual Roll</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Moisture (as received), max %</td>
<td>0.6</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>Mass of Desaturated Glass Felt, min (lb/100 ft²)</td>
<td>2.0</td>
<td>ASTM D 228</td>
</tr>
<tr>
<td>Surfacing and Stabilizer, max (%)</td>
<td>53</td>
<td>ASTM D 228</td>
</tr>
<tr>
<td>Asphalt, min (lb/100 ft²)</td>
<td>9.0</td>
<td>ASTM D 228</td>
</tr>
<tr>
<td>Ash Glass Mat, (%)</td>
<td>74</td>
<td>ASTM D 228</td>
</tr>
<tr>
<td>Unrolling @ 40°F &amp; 140°F (pass/fail)</td>
<td>Pass/Pass</td>
<td>ASTM D 4601</td>
</tr>
</tbody>
</table>
2.3 ROOFING MEMBRANE PLIES


1. GLASS VI

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaking Strength; min; (lbf/in-width)</td>
<td>91 MD</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td></td>
<td>74 XMD</td>
<td></td>
</tr>
<tr>
<td>Pliability @ 77 °F &amp; 50%RH; ½&quot; radius;</td>
<td>Pass MD</td>
<td>ASTM D 2178/146</td>
</tr>
<tr>
<td>(pass/fail)</td>
<td>Pass XMD</td>
<td></td>
</tr>
<tr>
<td>Ash; ignition @ 1000 °F for 10min; max (%)</td>
<td>75</td>
<td>ASTM D 2178/146</td>
</tr>
<tr>
<td>Mass of Saturant; min (lb/100ft²)</td>
<td>6.6</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>Net Dry Mass of Desaturated Felt; min</td>
<td>2.2</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>(lb/100ft²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parting Agent &amp; Stabilizer; max (lb/100ft²)</td>
<td>0.7</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>Moisture, at point of manufacture; max (%)</td>
<td>0.6</td>
<td>ASTM D 95/146</td>
</tr>
<tr>
<td>Net Dry Mass of Saturated Felt; min</td>
<td>9.5</td>
<td>ASTM D 2178</td>
</tr>
<tr>
<td>(lb/100ft²)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.4 BASE FLASHING SHEET MATERIALS

A. Backer Sheet - Two Plies: smooth surfaced; suitable for application method specified.

1. GLASS VI

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaking Strength; min; (lbf/in-width)</td>
<td>91 MD</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td></td>
<td>74 XMD</td>
<td></td>
</tr>
<tr>
<td>Pliability @ 77 °F &amp; 50%RH; ½&quot; radius;</td>
<td>Pass MD</td>
<td>ASTM D 2178/146</td>
</tr>
<tr>
<td>(pass/fail)</td>
<td>Pass XMD</td>
<td></td>
</tr>
<tr>
<td>Ash; ignition @ 1000 °F for 10min; max (%)</td>
<td>75</td>
<td>ASTM D 2178/146</td>
</tr>
<tr>
<td>Mass of Saturant; min (lb/100ft²)</td>
<td>6.6</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>Net Dry Mass of Desaturated Felt; min</td>
<td>2.2</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>(lb/100ft²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parting Agent &amp; Stabilizer; max (lb/100ft²)</td>
<td>0.7</td>
<td>ASTM D 146</td>
</tr>
<tr>
<td>Moisture, at point of manufacture; max (%)</td>
<td>0.6</td>
<td>ASTM D 95/146</td>
</tr>
<tr>
<td>Net Dry Mass of Saturated Felt; min</td>
<td>9.5</td>
<td>ASTM D 2178</td>
</tr>
<tr>
<td>(lb/100ft²)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. Granule-Surfaced Sheet – One Ply: Grade G, Type I, II, or III, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified, and as follows:

1. Modified Bitumen Cap Sheet 250 FR GR

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness, mil (mm)</td>
<td>177 (4.5)</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Maximum Load, 73.4 ± 3.6ºF (23 ± 2ºC), lbf/in. (kN/m)</td>
<td>162 MD</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Elongation at Maximum Load, 73.4 ± 3.6ºF (23 ± 2ºC), %</td>
<td>61 MD</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Maximum Load, 0ºF ± 3.6ºF (-18 ± 2ºC), lbf/in. (kN/m)</td>
<td>165 MD</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Elongation at Maximum Load, 0ºF ± 3.6ºF (-18 ± 2ºC), %</td>
<td>57 MD</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Tear Strength, 73.4 ± 3.6ºF (23 ± 2ºC), lbf/in. (kN/m)</td>
<td>186 MD</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Low Temperature Flexibility, ºC</td>
<td>-18º</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Dimensional Stability, %</td>
<td>&lt;0.5</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Compound Stability, ºF</td>
<td>215º</td>
<td>ASTM D 5147/6164</td>
</tr>
<tr>
<td>Asbestos Content, %</td>
<td>Zero</td>
<td>EPA 600/R-93/116</td>
</tr>
<tr>
<td>Fire Resistance</td>
<td>Pass, Class A</td>
<td>ASTM E 108</td>
</tr>
</tbody>
</table>

C. Membrane-Reinforcing Fabric: Nonwoven, needle-punched white polyester fabric.

1.

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Warp</td>
<td>74 lbs</td>
<td>ASTM D 5034</td>
</tr>
<tr>
<td>Tensile Fill</td>
<td>45 lbs</td>
<td>ASTM D 5034</td>
</tr>
<tr>
<td>Elongation Warp</td>
<td>21%</td>
<td>ASTM D 5034</td>
</tr>
<tr>
<td>Elongation Fill</td>
<td>51%</td>
<td>ASTM D 5034</td>
</tr>
<tr>
<td>Elongation</td>
<td>61.5%</td>
<td>ASTM D 1682</td>
</tr>
<tr>
<td>Ball Burst</td>
<td>111 lbs</td>
<td>ASTM D 3787</td>
</tr>
<tr>
<td>Mullen Burst</td>
<td>176 lbs</td>
<td>ASTM D 3786</td>
</tr>
</tbody>
</table>
2.5 ASPHALT MATERIALS

A. Roofing Asphalt: ASTM D 312, high elongation, as provided by roofing system manufacturer for application.

1. SRP 1000

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Softening Point</td>
<td>190-205°F</td>
<td>ASTM D 36</td>
</tr>
<tr>
<td>Flash Point</td>
<td>555°F or greater</td>
<td>ASTM D 92</td>
</tr>
<tr>
<td>Penetration</td>
<td>15-20 units, 25°C</td>
<td>ASTM D 5</td>
</tr>
<tr>
<td>Ductility</td>
<td>3.5 cm, 25°C</td>
<td>ASTM D 113</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>80-90 psi</td>
<td>ASTM D 412</td>
</tr>
<tr>
<td>Elongation</td>
<td>150% min.</td>
<td>ASTM D 412</td>
</tr>
<tr>
<td>Density</td>
<td>1.0 or greater</td>
<td>ASTM D 70</td>
</tr>
<tr>
<td>Asbestos Content, %</td>
<td>None</td>
<td>EPA 600/R-93/116</td>
</tr>
<tr>
<td>Cold Temperature Bend</td>
<td>40°F min.</td>
<td>ASTM D 3111</td>
</tr>
<tr>
<td>Fire Resistance</td>
<td>Class A</td>
<td>ASTM E 108</td>
</tr>
</tbody>
</table>

2.6 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

2.7 ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing".
B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

   1. At end of each day's work, provide tie-offs to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
   2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
   3. Remove and discard temporary seals before beginning work on adjoining roofing.

D. Asphalt Heating: Do not raise roofing asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating. Do not heat roofing asphalt within 25 deg F (14 deg C) of flash point. Discard roofing asphalt maintained at a temperature exceeding finished blowing temperature for more than four hours.

E. Asphalt Heating: Heat and apply roofing asphalt according to roofing system manufacturer's written instructions.

F. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

G. Membrane installation further requirements:

   1. Place ply sheets to ensure water will flow over or parallel to, but never against, exposed edges.
   2. Ply should never touch ply even at roof edges, laps, tapered edge strips, and cants.
   3. Apply hot melt adhesive no more than ten feet ahead of each roll being embedded.
   4. Avoid excessive application of asphalt adhesive over top ply, leave top ply exposed with minimal asphalt at ply lines.
   5. Light brooming or squeegeeing may be required to aid adhesion of ply sheets, base sheets, and/or cap sheets.
   6. Avoid traffic on all newly installed membrane.
   7. Overlap previous day's work 24 inches.
   8. Lap ply sheet ends six inches. Stagger end laps twelve inches minimum.
   9. Fit plies into roof drain rims, install metal flashing and finishing plies, secure clamping collars, and install domes.
  10. Cut out fishmouths/side laps that are not completely sealed. Replace all sheets that are not fully and continuously bonded.
  11. Roof is to be inspected and approved by representative from roof system warrantor before application of surfacing.
  12. Follow warranty supplier's recommendations for backnailing requirements.
H. Daily Waterstop/Tie-Ins

1. Install "deadman" insulation filler at insulation staggers.
2. Extend roofing plies at least twelve inches onto prepared area of adjacent roofing. Embed plies into Specified Interply Adhesive. Strip edges with twelve-inch wide ply sheet embedded completely in alternate uniform courses of Specified Interply Adhesive.
3. At beginning of next day's work, remove temporary connection by cutting felts evenly along edge of existing roof system. Remove "deadman" insulation fillers.

2.8 BASE-SHEET INSTALLATION

A. Install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:

1. Attach glass base sheet to wood decking using approved fasteners in a pattern to achieve FM-I90 wind uplift.
2. Adhere a single layer of ½" wood fiber insulation to attached base sheet in a full mopping of specified asphalt.

2.9 ROOF MEMBRANE INSTALLATION

A. Install roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Adhere to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 deg F (218 deg C). Asphalt application shall result in approximately 25 pounds of asphalt (± 25% on a total job average basis) per roof square between each ply.
2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
3. Install specified membrane as starter strips at all edges, perimeters, transitions, around equipment curbs, and penetrations, and drains, a minimum of 18" width from the top of the cant strip or from the edge on to the roof in specified ply adhesive.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

C. Install roofing membrane sheets so side and end laps shed water.
2.10 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions, and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Backer Sheet Application: Adhere backer sheet to substrate in a solid mopping of hot roofing asphalt at not less than 425 deg F (218 deg C).
3. Backer Sheet Application: Adhere backer sheet to substrate in asphalt roofing cement at rate required by roofing system manufacturer.
4. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 deg F (218 deg C).
5. Flashing Sheet Application: Adhere flashing sheet to substrate in asphalt roofing cement at rate required by roofing system manufacturer.
7. Liquid Applied: Two Coats, Apply base coat and embed fabric at rate required by roofing system manufacturer, apply top coat at rate required by roofing system manufacturer.

B. Additional instructions for mineral surface flashing cap.

1. Snap a chalk line 6” from the toe of cant out onto roof membrane.
2. Measure the distance from the chalk line up the wall to where flashing will be terminated. On sloped roofs, take two measurements 1 meter (39”) apart.
3. Measure down length of a roll of specified membrane, and cut, in cross machine direction, a section same length. If roof is sloped, start at the bottom, and transfer height measurement to cutting of the flashing cap. Each section is 1 meter (39”) in width.
4. The joints of the membrane covering the deck should be staggered so that the membranes covering the vertical face of the parapet or curb do not coincide with those covering the deck.
5. Starting at the low end of the area being flashed, apply section in specified adhesive using a strapping method, overlapping the exposed smooth selvage with each new section. Bottom of flashing cap must be lined up 6” from toe of cant, on chalk line.
6. The salvage of the last section should be cut flush to the mineral surface prior to the application, ensuring that total flashing surface is mineral surfaced.
7. All areas where excessive adhesive is exposed on side laps may be coated with specified heat reflective coating or granules sprinkled in as flashing sections are installed.

C. Additional instructions for white plastic clad flashing cap

1. Calculate the length of membrane required covering the flashing or curb.
2. Use 39” wide (roll width) strips of membrane cut from length of roll and install in a strapping to cover the vertical flashing area of the wall or curb. Overlap the smooth selvedge with each piece.
3. The joints of the membrane covering the deck should be staggered so that the membranes covering the vertical face of the parapet or curb do not coincide with those covering the deck.
4. Dry fit flashing pieces.
5. Note: If the bottom edge of the flashing is to be adhered to a white clad surfaced modified bitumen field sheet, the white cladding in the lap areas of the field sheet must be removed.
6. Using a chalk line, lay-out a straight line on the field membrane ply surface, parallel to the roof edge, six (6) inches inside the roof from the base of the previous base-flashing ply installed.
7. Using a torch and heated trowel, remove the white cladding from the soft bitumen from the chalk line toward the flashing area. NOTE: this procedure may also be accomplished through the use of cladding removal knife tool.
8. Solidly torch surfacing ply of flashing cap over the previously installed base ply or plies. Always work from the 3” selvedge. Using a damp sponge, apply pressure to the membrane to assure that it has made full contact with the substrate. Care should be taken not to deform the waffle pattern.
9. When preparing an outside or inside corner, where membrane will lap over the clad surfacing, the white surfacing must be removed by the following procedure before welding membrane to itself:
10. Carefully score the clad surface with a sharp utility knife along the outer edge of area where cladding is to be removed and bitumen is to be exposed (use straight blade, not hooked).
11. Care must be taken to cut only through the cladding, not through the membrane fabric reinforcement.
12. Lightly warm the surface of the metal to be removed using a torch enough to loosen the bond between the cladding and bitumen.
13. Care must be taken to not overheat this area or scorching adjoining area of finished surfaces. Immediately after warming surface of cladding, carefully peel off the area to be removed.
14. Additional warming and cutting may be necessary. To facilitate, warm the surface as you peel away cladding.
15. Ensure the two membranes are perfectly welded, without air pockets, wrinkles, fish mouths or tears.
16. After installation of the top ply, check all lap seams on the top ply using a seam probe.
17. During installation, avoid asphalt seepage greater than ¼” at seams.

D. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and a maximum of 14 inches above finished roof, and 4 inches (100 mm) onto field of roofing membrane.

E. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing, fasten minimum of 8 inches on center.


F. Install specified counter flashing system as per detail drawings.

G. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer’s written instructions.

H. Flashing at Single and Multiple Penetrations-Small Pipes and Conduits.
1. Remove existing pitch pans.
2. Install new insulation and roofing membrane system.
3. Apply 1/16 inch uniformly thick layer of asphalt mastic to surface receiving metal flange.
4. Install specified pitch pan(s) around penetration(s).
5. Prime metal flange, projection, and pitch pan interior with asphalt primer. Do not prime pan interior or projection if urethane pitch pocket sealant is used.
7. Fill to pitch pan 3/4" from top with non shrink grout, allow to set up.
8. Seal top with specified pitch pan sealant.
9. All penetrations will receive a bonnet or watershed as shown in detail drawings.

I. Flashing at Plumbing Vents.

1. Remove existing stack flashing.
2. Wedge plumbing vent tight against deck.
3. Fabricate and install plumbing vent flashing from specified lead.
   a. Flange, six inches wide minimum, extend completely around periphery of vent flashing. Set flange into asphalt mastic. Neatly dress flange with wood block.
   b. Pipe outside diameters greater than two inches: Bend lead inside pipe one inch minimum with rubber/plastic mallet. Replace cracked lead.
   c. Pipe outside diameters two inches or less: Cut lead at vent top. Fabricate and install integral lead cap.
   d. Prime metal flange with asphalt primer and allow to dry.
   e. Apply flashing adhesive on metal flange and onto roof.
   f. Flash with three targets of flashing base ply felt, four, eight, and twelve inches larger than lead flange.

J. Flashing at Equipment Stands – “I” Beams and Angle Irons.

1. Remove existing flashing. Weld 1/4 inch plate steel (where required) to open portion of beam. Slope to shed water away from I-beam. Fill beam interior below sloped plate to roof deck with batt insulation. Install vertical and horizontal sections of wood blocking around column. Blocking height to be a minimum of 8 inches above final insulation surface. Provide tapered edge strip and cant around stand. Mechanically attach to deck; miter corners.
2. Install new roofing two inches beyond top edge of cant. Adhere base ply(s) of specified flashing membrane. Overlap section four inches. Extend flashing ply four inches beyond toe of cant.
3. Install top ply of specified flashing membrane over the base ply, extend six inches beyond base flashing ply. Mechanically fasten top of flashing to substrate with one inch cap nails eight inches o.c. Adhere flashing tape, to vertical flange of welded plate and around entire column. Surface flashing with specified reflective coating (if specified).
4. Fabricate and install new aluminum counterflashing. Mechanically fasten counterflashing to structural beam with compatible bar/fasteners. Extend counterflashing two inches below top of base flashing. Wipe clean top surface of
counterflashing with metal cleaner. Caulk top of counterflashing, provide watershed, and tool neatly. Paint exposed installed steel with specified reflective coating.

K. Flashing at Expansion Joints, Roof Dividers, and Coping.

1. Install new wood blocking at flashing base. Provide tapered edge strip over installed insulation at blocking edge. Firmly butt tapered edge strip to blocking. Edge strip shall be properly adhered or attached to the substrate.
2. Properly adhere or attach cant strip securely to substrate and blocking.
3. Extend new roofing at least two inches beyond top edge of cant.
4. Adhere flashing base ply(s) and top ply to flashing substrate in a continuous application of flashing adhesive. Remove wrinkles and voids. Overlap sections four inches. Extend flashing ply four inches beyond toe of cant, and top ply four inches beyond toe of base ply.
5. Expansion Joints shall receive the following:
   a. Install vinyl water barrier over joint opening. Allow barrier to drape four inches within joint opening. Nail both sides of barrier eight inches o.c.
   b. Insert fiberglass batten insulation into expansion joint opening; fill entire opening.
6. Install flashing as specified.
7. Install joint cover as shown on detail drawing.

L. Flashing at Scuppers.

1. Remove existing scupper liners and membrane to wood blocking.
2. Replace rotted and untreated blocking as needed and approved by owner’s representative with new, treated wood blocking.
3. Install base membrane over wood blocking, into the port and out onto the roof 2 feet in all directions, set in a bed of asphalt mastic.
4. Install pre-manufactured scupper.
5. Install scupper head below outside of port and new downspouts.
6. Prime metal surfaces to receive membrane plies and allow to dry.
7. Solidly adhere roof membrane plies completely to stripping plies, scupper flanges, cant, and port, progressing plies 1-2” further than previous applied ply.
8. Wall flashings shall extend over flanges and roof membrane out 6” past cant.

M. Flashing at Gravel Stops, Drip Edges, and Fascia.

1. Remove existing edge flashing system to wood blocking.
2. Replace rotted blocking as needed and approved by building owner's representative.
3. Provide tapered edge strip along gravel stop, over installed insulation at blocking edge. Firmly butt tapered edge strip to blocking. Fully adhere edge strip to insulation.
4. Solidly adhere roof membrane plies completely to insulation and blocking. Envelope felts. Ensure complete bond and continuity without wrinkles or voids.
5. Install fascia system and stripping plies according to detail drawings.
6. Install new downspouts at spill-out scupper locations. Dimensions to match existing.

N. Flashing at Edge/Gutters.
1. Remove existing edge flashing, gutters and downspouts.
2. Replace rotted blocking as needed and approved by building owner’s representative. Install insulation firmly butting against wood blocking.
3. Solidly adhere roofing membrane plies completely to insulation blocking. Ensure complete bond and continuity without wrinkles or voids. Envelope felts.
4. Fabricate and install new edge/gutter with outlet tubes. Locate outlet tubes in original position. Slope gutter to outlets.
5. Install gutter support system.
6. Provide gutter expansion joints every 30 feet.
7. Fasten and strip-in drip edge flange according to detail drawing.
8. Install new downspouts. Dimensions to match existing.

O. Roof Drains: Set 30-by-30-inch- (760-by-760-mm-) square metal flashing in bed of asphalt roofing cement on completed roofing membrane. Cover metal flashing with roofing membrane cap-sheet stripping and extend a minimum of 6 inches (150 mm) beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring. Refer to Section 22146 – Roof Drains for further information.

2.11 FIELD QUALITY CONTROL

A. Manufacturer must provide a full time technical employee – authorized to make field decisions to support warranty coverage. Frequency of visits shall be 3 days each week – for the duration of the project.

B. Test Cuts: Test specimens may be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.
2. Test specimens will be examined for interply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
3. Repair areas where test cuts were made according to roofing system manufacturer's written instructions.

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

D. Roofing system will be considered defective if it does not pass tests and inspections.
1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.
2.12 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075113