SPEC WRITERS NOTE: This specification includes materials and installation procedures for **BlockShield™ SA Plus** for Roofs which is a self-adhered non-asphaltic, durable, impermeable air, water and vapor barrier membrane. **BlockShield SA Plus** sheet membrane is used as a roofing underlayment designed for low and steep slope roof applications applied direct to steel roof decks or over a gypsum thermal barrier board. **BlockShield SA Plus** roofing underlayment is also designed for steep slope applications over plywood, or OSB or exterior rated gypsum board. This guide specification should be adapted to suit the requirements of individual projects. It is prepared in CSI Master Format and should be included as a separate section under Division 7 - Thermal and Moisture Protection.

SELF-ADHERING IMPERMEABLE AIR BARRIER UNDERLAYMENT FOR SLOPED ROOFS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. This specification is applicable to all trades involved with substrates, preparation, application of air barrier membrane and subsequent connections to surrounding construction materials. It is the [Contractors] [Construction Managers] responsibility to inform all trades the extent of their work associated with the membrane system and overlapping Work.

B. Examine all Drawings and all Sections of the Specifications for requirements and provisions affecting the work of this Section.

1.2 DESCRIPTION OF WORK

A. The work of this Section includes furnishing and installation of BlockShield SA Plus, a fully self-adhered, non-asphaltic, durable, impermeable air, water, and vapor barrier membrane with an aggressive pressure-sensitive adhesive, incorporated in exterior low and steep sloped roofing assemblies, at locations indicated on Drawings and elsewhere as noted and as required by code.

B. The work of this Section also includes furnishing and installation of compatible flashing materials to bridge gaps, for transition areas of roof to openings and interface and elsewhere as indicated or required by code to provide a continuous air barrier assembly. Locations include, but are not limited to, the following:
   1. Connection of the roof to wall air barrier assembly.
   2. Openings and penetrations of roof system for skylights, roof hatches and mechanical equipment including piping, conduit, ducts and similar penetrations.
   3. All leakage pathways between the building envelope and the roofing assembly

C. Provide material and work for this Section as required to complete mock-up of sloped roof assembly. Refer to exterior elevations for extent of mock-up panels or as indicated herein.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all of the Contract Documents for requirements which effect the work of this section.

B. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following:
   1. Section 015010 -Temporary Permeable Air-Water Barrier for Mass Timber Construction.
   2. Section 053100 - Steel Deck
   3. Section 061600 - Sheathing
   4. Section 061700 - Shop Fabricated Structural Wood.
   5. Section 061713 - Laminated Veneer Lumber.
   6. Section 072100 - Building Insulation and Vapor Barriers.

7. Section 072200 - Roof and Deck Insulation.
8. Section 072727.01 - Self-Adhering Water-Resistive Air Barrier Membrane System-WrapShield
9. Section 072743 - Highly Permeable Self-Adhering Air Barrier Membrane/Roofing Underlayment
10. Section 073000 – Steep Slope Roofing
11. Section 073100 - Shingles and Shakes.
12. Section 073116 - Metal Shingles.
13. Section 073129 - Wood Shakes and Shingles.
14. Section 073213 - Clay Roof Tiles.
15. Section 074113.13 - Formed Metal Roof Panels.
16. Section 074113.16 - Standing-Seam Metal Roof Panels.
17. Section 074113.19 - Batten-Seam Metal Roof Panels.
18. Section 074116 - Insulated Metal Roof Panels.
19. Section 075216 FL - Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing.
20. Section 075316 FL - Chlorosulfonate-Polyethylene (CSPE) Roofing.
21. Section 075323 FL - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing.
22. Section 075416 FL - Ketone Ethylene Ester (KEE) Roofing.
23. Section 075419 FL - Polyvinyl-Chloride (PVC) Roofing.
24. Section 075423 FL - Thermoplastic-Polyolefin (TPO) Roofing.
25. Section 075552.13 FL - Atactic-Polypropylene (APP) Modified Bituminous Protected Membrane Roofing.
26. Section 075552.16 FL - Styrene-Butadiene-Styrene (SBS) Modified Bituminous Protected Membrane Roofing.
27. Section 075556 FL - Fluid-Applied Protected Membrane Roofing.
28. Section 076100 - Sheet Metal Roofing.
29. Section 078400 - Firestopping.
30. Section 079200 - Joint Sealants.

1.4 REFERENCE STANDARDS

A. American Society of Civil Engineers: ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

B. ASTM International (ASTM):
1. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
2. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
3. ASTM D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
4. ASTM D3330 - Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape.
5. ASTM D5034 - Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).
6. ASTM D7349 - Standard Test Method for Determining the Capability of Roofing and Waterproofing Materials to Seal Around Fasteners.
7. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
8. ASTM E96/96M - Test Methods for Water Vapor Transmission of Materials.
9. ASTM E154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
10. ASTM E398 - Standard Test Method for Water Vapor Transmission Rate of Sheet Materials Using Dynamic Relative Humidity Measurement.
11. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials.
12. ASTM F1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor

C. CAN/ULC-S742-11-R2016

D. International Code Council Evaluation Service, Inc. (ICC-ES): ICC-ES - Acceptance Criteria for Water-Resistive Barriers. 1.3.5 Self-adhered polymeric-based barrier, 1.3.6 Air Barrier

E. CDPH/EHLB Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2.

1.5 SUBMITTALS

A. Submit manufacturers' current product data sheets, details and installation instructions for the water-resistive vapor impermeable air barrier membrane components and accessories.

B. Submit samples of the following:
1. Manufacturer's sample warranty.
2. 3 each water-resistive vapor impermeable air barrier membrane, minimum 8 by 10 inches (203 by 254 mm).
3. Accessory components.
   a. VaproBond™, 1 sausage
   b. 3 each VaproShim SA™ Self-Adhered, 3 mm (⅛ in.), 1 in. x 4 in. (2.5 cm x 10.1 cm)
   c. 3 each VaproShim SA™ Self-Adhered, 7 mm (¼ in.), 1 in. x 4 in. (2.5 cm x 10.1 cm)
4. Membrane flashing products.
   a. 3 each BlockFlashing Samples, minimum, 8 by 10 inches (203 by 254 mm).
5. Sealants (included by others) required to provide a complete air barrier membrane system.

Delete section C if not pursuing LEED certification.

C. LEED Submittals:
1. Integrative process [IP] has a 1 pt. potential. VaproShield encourages this through preconstruction planning, for 'building envelope attributes'.
2. Energy and Atmosphere [EA].
   a. Minimum Energy requirement prerequisite and performance points – by providing a complete air barrier system: up to 18 pts.
   b. Commissioning (i.e., BECx): Energy load reductions, Indoor Environmental Quality, and longevity of building components which are required to satisfy the prerequisite if commissioning / verification for building envelope is chosen as a path prior to DD. Envelope Commissioning may qualify for additional 2 pts, on top of the 4 pts via building energy simulation (enhanced commissioning), or complying with the prescriptive paths in ASHRAE 90.1-2010
3. Indoor Environmental Quality [IEQ/EQ].
   a. As part of IAQ Management plan for construction phase which protects building from moisture infiltration, BlockShield SA Plus can help provide an additional 1 pt.
   b. BlockShield SA Plus complies with exterior product (emission req. exempt) requirements and VOC limits per SCAQMD Rule #1168 (as published Sept. 2017).
      1) All window sealant and flashing materials exposed to interior must pass CDPH/EHLB/Standard Method V1.2 (Sect. 01350) for VOCs after 14 days cure time.
4. Awareness and Education [AE] and/or Innovation [IN/ID]
   a. Applies to projects which offer both a case study and educational outreach program, which use the project as an example. 1 pt. available.

1.6 QUALITY ASSURANCE

A. Single Source: Obtain self-adhered water and vapor impermeable air barrier membrane components and accessories from a single-source membrane system manufacturer to ensure total system compatibility and integrity.

B. Manufacturer Qualifications:
   1. Company specializing in manufacturing and supply of highly vapor permeable water resistive air barrier products and water and vapor impermeable air barrier products specified in this Section with minimum [**10**] ten years' experience and successful installations in similar project applications.
      a. Provide manufacturer's experienced in-house technical and field observation personal qualified to provide technical support.

C. Applicator:
   1. Company specializing in performing Work of this Section with minimum [3] three years' experience.

D. Fire Performance Characteristics: Provide water-resistive barrier meeting the following fire-test characteristics.
   1. Surface-Burning Characteristics: ASTM E84
      a. Flame spread index: 5 or less
      b. Smoke developed index: 15 or less
   2. Conforms to UL 790 and CAN/ ULC-S107. Utilizing a ¼" thermal board applied to the roof deck will create a UL Class roof assembly.

1.7 MOCK-UP

A. Construct mock-up in accordance with Section 014339 - Mock-up, or as specified under General Requirements Section 011000.

B. Provide mock-up of specified water and vapor impermeable air barrier materials under provisions of Section 013323 - Shop Drawings, Product Data and Samples.

Generally, retain first subparagraph below if requiring preconstruction testing.

   1. Coordinate construction of mockups to permit inspection and testing of impermeable air barrier placed along with interfacing parapet, wall, curb flashing and roofing components, before roof insulation and roof products are installed.
   2. Prior to installation of specified water and vapor impermeable air barrier materials on the building low or steep sloped roof, construct a 100 square foot mockup of typical exterior roof assembly, including connection between roof and parapet or wall to indicate relationship of materials with water/air barrier and quality of workmanship. Provide mock-up using actual water/air barrier membrane and associated products, for low and steep sloped roof materials. Provide several mock-ups if necessary to include the various conditions. Acceptable mock-ups, undamaged at time of Substantial Completion, may be incorporated into the finish work. Rebuild mock-up's which are not approved at no additional cost to the Owner.
   3. Construct mock-up in accordance with details of mock-up indicated on the Drawings or as specified.

1.8 PRE-INSTALLATION CONFERENCE

A. Provide a pre-installation conference [two] [Insert] weeks prior to commencing work of this section, under provisions of Section 013119 - Project Meetings or as specified under General Requirements Section 011000. Location of conference is at building site, unless noted otherwise.

B. Ensure all contractors responsible for creating a continuous plane of water and air tightness are present.

C. Agenda includes the following:
1. Review of approved submittals.
2. Review of mock-ups.
3. Coordination with sequence of installation with adjacent materials.
4. Schedule for subsequent work covering impermeable air, water, and vapor barrier membrane.
5. Procedures for quality assurance.

1.9 DELIVERY, STORAGE AND HANDLING

A. Refer to current Product Data Sheet, Installation Instructions and Safety Data Sheets (SDS) at www.vaproshield.com for proper storage and handling.

B. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.

C. Store roll materials on end in original packaging. Protect rolls from direct sunlight and inclement weather until ready for use.

D. Waste Management and Disposal
1. Separate and repurpose or recycle waste materials in accordance with Section [017419 Construction Waste Management and Disposal], and with the Waste Reduction Work Plan.

1.10 COORDINATION

A. Ensure shingled lapping and continuity of the fully self-adhered water and vapor impermeable air barrier membrane throughout the scope of this section.
1. Provide BlockShield SA Plus including self-adhered water/air barrier membrane, transition membranes, flashing and sealants at penetrations. Provide BlockFlashing including VaproBond™ by VaproShield, a liquid-applied sealant.
2. Coordinate for optimal sequencing with all related or interfaced building components and trades to facilitate best practices including: shingle-fashion, drainage, water-tightness, and air barrier continuity.

1.11 ALTERNATIVES

A. Submit request for alternates in accordance with Section 012500 - Substitution Procedures.

B. Submit requests for alternates a minimum of ten (10) working days prior to bid date.

C. Alternate submission to include:
1. Evidence that alternate materials meet or exceed performance characteristics of specified Product requirements as well as documentation from an approved independent testing laboratory certifying the minimum physical dimensions, tensile strength, fire burning characteristics, vapor permeance and air leakage rates of the fully self-adhered

water-resistive vapor impermeable air, water, and vapor barrier membrane. All testing to be performed without the aid of primers or surface conditioners.
2. Manufacturer's complete set of details for fully self-adhered impermeable air, water, and vapor barrier membrane.
3. Air barrier membrane system showing a continuous plane of water and air tightness throughout the building enclosure.
4. Manufacturer of alternate materials has experienced in-house technical and field observation personnel qualified to provide expert technical support.

D. Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to bid date shall not be permitted for use on this project.

1.12 WARRANTY

A. Provide manufacturer's standard material warranty in which manufacturer agrees to provide replacement material for the fully self-adhered water and vapor impermeable air barrier material installed in accordance with manufacturer's instructions that fail due to material defects within [20] twenty years from the date of substantial completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide a fully self-adhered water and vapor impermeable air barrier membrane and accessories obtained from a single-source manufacture to ensure total system compatibility and integrity.

B. Water and Vapor Impermeable Self-Adhered Air Barrier Materials for Low and Steep Sloped Roofs.
1. Basis-of-Design Product: Subject to compliance with requirements, provide fully self-adhered air barrier sheet membrane BlockShield™ SA Plus Water and Vapor Impermeable Air Barrier Sheet as manufactured by VaproShield, a zero VOC fully self-adhered vapor impermeable air barrier sheet membrane consisting of laminated layers of polypropylene with adhesive. Provide sheet membrane tested in accordance with ICC-ES.
2. Criteria to meet IBC and IRC requirements for weather resistive barriers having the following properties:
   a. Color: white membrane with allowable UV exposure for 6 months, prior to coverage.
   b. Thickness: 0.26 mm (10.2 mil)
   c. Weight: ASTM D5147 Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material: 289 g/m^2 (0.95 oz/yd^2)
   d. Roll Weight with release film: 1.5 m (60") W 18.6 kg (41 lbs) and 0.76 m (30") W 8.6 kg (19 lbs)
   e. Roll Width and Length: 1.5 m x 30.5 m (60" x 100') and 0.76 m x 30.5 m (30" x 100')
   f. Roll Coverage: 1.5 m (60") equals 46.5 m^2 (500 ft^2) gross and 0.76 m (30.5") equals 23.2 m^2 (250 ft^2) gross
   g. Warranty: 20 years
   h. Ultraviolet Light Exposure: 6 months prior to covering
   i. Service Temperature: -40 °C (-40 °F) – 132 °C (270 °F)
   j. Installation Temperature minimum: -6.7 °C (20 °F)
   k. Composition: Heat Laminated polypropylene
   l. Primer: No Primer Required
   m. Elongation to ASTM D412: MD – 409%, XMD – 276%
   n. Tensile Strength, Minimum to ASTM D412: MD – 16.96 MPa (2460 psi), XMD – 11.87 MPa (1721 psi)

o. Dry Tensile Strength, to ASTM 882: MD – 3.85 N/mm (22 lbf/in), XMD – 3.85 N/mm (22 lbf/in)
p. Elongation at Break to ASTM D882: MD – 541%, XMD – 617%
q. Dry Breaking Force (Grab Method) to ASTM D5034: MD – 338 N (76 lbf), XMD – 356 N (80 lbf)
r. Elongation at Break to ASTM D5034: MD – 120%, XMD – 157%
s. Minimum Puncture Resistance to ASTN E154: Deflection 5.84 cm (2.3”), Max Load 249 N (56 lbf)
t. Vapor Permeance tested to ASTM E96 desiccant method, procedure A: 0.0173 perms (0.992 ng/Pa•s•m^2).
u. Water Vapor Permeance tested to ASTM F1249 (23 °C 50% RH): 0.0193 perms (1.10 ng/Pa•s•m^2).
v. 90° Peel Adhesion to ASTM D3330 Method F: All conditions PASS ≥ 0.26 N/mm (1.5 lbs/in).
w. Air Permeance: 0.0027 L/s•m^2 @ 75 Pa (0.0018 cfm/ft^2 @ 1.57 psf) when tested in accordance with ASTM E2178.
x. Air Permeance for an Assembly: 0.00912 L/s•m^2 @ 75 Pa (0.0005 cfm/ft^2 @ 1.57 psf) when tested in accordance with ASTM E2357.
y. Nail Sealability to ASTM D1970 section 7.9 referring to ASTM D7349: PASS
z. AC 48 Acceptance Criteria for Self-Adhered Roof Underlayments for use as Ice Barriers. Section 4.4.1 Water-ponding Test (610 mm water column for 48 hours): No leakage - Pass.
aa. 90-Degree Peet Strength to ASTM D3330.
    1) Steel Deck 879 N/m (5.02 lb./in)
    2) Gypsum Board 751 N/m (4.29 lb./in)
    3) Coated Fiberglass Faced Board 380 N/m (2.27 lb./in
bb. Surface Burning Characteristics tested to ASTM E84: Class A, Flame-Spread index of less than 5, Smoke-Developed index of less than 15.
cc. Deflection and maximum load to ASTM E154:
dd. Uplift Strength: FM LPDS 1-52 Field Verification of Roof Wind Uplift Resistance:
    1) Steel deck – 11.12 kN/m^2 (232.5 psf).

C. Vapor Impermeable Transition and Flashing Membrane
1. Provide self-adhered air barrier transition and flashing membrane for all sloped roofing transitions. Provide pre-cut BlockFlashing by VaproShield. BlockFlashing is a zero VOC fully self-adhered vapor impermeable sheet membrane having the following properties:
    a. Same material and properties as BlockShield SA Plus Self-Adhered Water and Vapor Impermeable Air Barrier Sheet. (See 2.1.B.1 above).
    b. Physical Dimensions: BlockFlashing White: 6.5 inches x 100 feet (16.5 cm x 30.5 m), 11.75 inches x 100 feet (29.8 cm x 30.5 m), 14.75 inches x 100 feet (37.5 cm x 30.5 m)

SPEC WRITERS NOTE: Acceptable substrates for BlockShield SA Plus Water and Vapor Impermeable Air Barrier Sheet; exterior grade gypsum board, plywood, OSB, precast concrete, cast-in place concrete, steel, aluminum and galvanized metal deck. Best practice guidelines for the application of BlockShield SA Plus on clean, dry surfaces of sheathing surfaces without the use of adhesive-primers. Applications of BlockShield SA Plus on sheathing surfaces clean of oil, dust, bulk water or other contaminants including primers, should be followed by roller pressure to ensure good adhesion, immediately after installation of material.
Rough opening flashing system includes: BlockFlashing.

D. BlockShield SA Plus End Laps over Metal Deck
1. Provide 24 gauge by 6 inch (15.2 cm) wide galvanized sheet steel strip for placement over flutes of metal deck at membrane end laps. Attach metal strip to deck flutes using #10 pancake head screws through 9/32 inch (7.14 mm) predrilled oval holes.

E. Transition Flashing
1. Transition flashing includes VaproSilicone Transition™ Sheet by VaproShield, a flexible 80 mil (2 mm) extruded silicone sheet.
a. VaproSilicone Transition™ Sheet: 4, 6 or 9 inches (10.2, 15, 23 cm) x 50 feet (15.24 m) long.
b. Dynamic Movement Capability: +200 / -50 % when tested in accordance to ASTM C1523.
2. Elongation: 400 % when tested in accordance to ASTM D412.
a. Tensile Strength: 295 psi (2.03 MPa) when tested in accordance with ASTM D412.
b. Tear Strength: 20 ppi (3.5 N/mm) when tested in accordance to ASTM D624.

F. Metal Roofing Fastener Shims
1. At fastener securement locations provide self-adhering VaproShim SA below clips. Shim sizes are 1 inch (2.54 cm) by 4 inches (10.16 cm) by [**⅛ inch (3.17 mm)**] [**¼ inch (6.35 mm)**] thick, 3 inch (7.62 cm) by 4 inches (10.16 cm) by 1/8 inch (3.17 mm) thick or custom sized**.**

2.2 PENETRATION SEALANT

A. Provide sealant for penetrations as recommended by manufacturer and as specified under Section 079200 - Joint Sealants, and complying with ASTM C920. Appropriate sealant shall be VaproBond™.

2.3 ROOF ROLLER

A. Provide extendible roller tool designed to provide optimal leverage for roller-based self-adhered membrane. Provide roller incorporating heavy duty design die-cast second handle for additional leverage, two handed operations to firmly secure the adhesive to the substrate. Provide unit that is compact and lightweight with a 7.5 inch (19 cm) wide design.
1. When appropriate a floor roller may be used for low and steep sloped roof installations.

SPEC WRITERS NOTE: VaproShield's self-adhered membranes incorporates a pressure sensitive adhesive (PSA) that requires pressure rolling to activate the adhesion.

PART 3 - EXECUTION

3.1 GENERAL

A. Verify that surfaces and conditions are ready to accept the work of this section. Notify [**Envelope Consultant**] [**Engineer**] [**Architect**] [**Construction Manager**] in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrates. For low and steep slope roofing, contact VaproShield technical for assistance.

B. All new surfaces must be dry, sound, clean, free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the water and vapor impermeable air barrier membrane and flashings. Fill voids and gaps in substrate greater than 7/8 inch (22 mm) in width to provide an even surface. Remove any sealant products from low and steep sloped roof sheathing surface prior to installation of air barrier membrane.

C. Minimum application temperature of fully self-adhered membrane and flashings to be above 20 °F (minus 6.7 °C). New substrate must be clean, dry and **frost free - No frozen condensation**.

D. Ensure all preparatory work is complete prior to applying primary fully self-adhered vapor impermeable air barrier sheet membrane.

E. Set flush with roof sheathing, any mechanical fasteners used to secure sheathing surfaces or that penetrate sheathing surfaces. Provide fasteners secured into solid backing and covered with the upper overlapping membrane. If exposed fasteners are present on the surface of the membrane, cover and seal with VaproBond™.

F. If exposed fasteners are required, use VaproCaps™ with the appropriate fastener into structural members to ensure water/air tight seal.

3.2 COORDINATION OF SELF-ADHERED VAPOR IMPERMEABLE AIR BARRIER MEMBRANE INSTALLATION

A. Download Installation Instructions at http://vaproshield.com/public-documents/installation-instructions.

B. Installation Summary:
1. Self-adhered water and vapor impermeable water/air barrier is installed on exterior roof assemblies of exterior plywood, OSB board, gypsum sheathing board or other approved substrates.
2. Complete detail work at; roof openings, building transitions and penetrations prior to field applications allowing for shingle laps with release film temporarily left in place as needed.
3. Install fully self-adhered water and vapor impermeable water/air barrier sheet over the outside face of exterior roof sheathing board or substrate, measure and pre-cut into manageable sized sheets to suit the application conditions.
4. Install fully self-adhered water and vapor impermeable water/air barrier complete and continuous to roof substrate minimal overlapping weatherboard as per slope.
   a. Requires a weatherboard shingled 3-inch (76 mm) overlap including any vertical seams.
5. Stagger all end lap seams.
6. Roll installed membrane with a two-handed roller to ensure positive contact and adhesion with substrate immediately.

3.3 BUILDING TRANSITION CONDITIONS

A. Tie-in to intermittent floors, parapet curbs, at the interface of dissimilar materials with self-adhering air barrier transition sloped roof and flashing membrane.

B. Align and position fully self-adhered water and vapor impermeable water/air barrier membrane, remove protective film and press firmly into place. Provide minimum 3 inch (76 mm) lap on to substrates.

C. Ensure minimum overlap at side and end laps of membrane.

D. Roll membrane and lap seams with roller to ensure positive contact and adhesion, immediately.

3.4 MECHANICAL EQUIPMENT PENETRATIONS

A. Electrical services penetrating the roof assembly and fully self-adhered vapor impermeable water/air barrier membrane must be placed in appropriate conduit and secured solid into position.

B. Install manufactured flanged penetration sleeves as recommended by sleeve manufacturer.

C. For roof penetrations, cut and fit fully self-adhered vapor impermeable water/air barrier to accommodate sleeve, install VaproBond™ or BlockShield SA to seal the water/air barrier membrane to ductwork or preformed flange sleeve.

D. For pipe penetrations, refer to manufacturer's standard details.

3.7 FIELD QUALITY CONTROL

A. Make notification when sections of work are complete to allow review prior to covering fully self-adhered water-resistive vapor impermeable water/air barrier system.

B. Owner to engage independent consultant to observe substrate and membrane installation prior to placement of cladding system(s) and provide written documentation of observations.

3.8 PROTECTION

A. Protect roof areas covered with self-adhered water impermeable water/air barrier from damage due to construction activities, high wind conditions.

B. Review condition of fully self-adhered water-resistive vapor impermeable air barrier prior to installation of roofing membrane. Repair, or remove and replace damaged sections with new membrane.

END OF SECTION