SECTION 07 27 00

AIR AND WATER BARRIER

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

B. Refer to other Divisions of these specifications to determine the type and extent of work therein affecting the work of this trade, whether or not such work is specifically mentioned in this Section.

1.02 SUMMARY

A. Reference Drawings: The Work of this Section is shown on the Contract Drawings titled “Physical Education Building Exterior Renovations, Montgomery College, Germantown Campus Germantown, MD”.

B. The scope of work specified herein includes, but is not limited to, the following:

1. Existing direct applied stucco cladding over CMU backup walls will remain. Remove and dispose of loose or damaged existing stucco cladding; patch and repair damaged or removed stucco as required, see referenced Sections.

2. Provide new self-adhered membrane air/water barrier membrane and membrane flashing, and all related accessories for proper installation, as shown on the drawings.

3. Perform mockups of the work specified herein in coordination with mockups described in related Sections.

C. The work shown in the Contract Documents includes the work of all trades required and all labor, equipment, and materials and supervision necessary and incidental to the work indicated. The following description of the work represents a summary and should be considered in conjunction with the Drawings and all other Specifications.

D. All work is to be done in accordance with applicable codes and regulations.

1.03 RELATED SECTIONS

A. Coordinate the work of this Section with the work of other trades under this Contract, including, but not limited to, the following:

1. Section 02 41 19 – Selective Demolition

2. Section 04 20 00 – Unit Masonry

3. Section 04 22 00 – Concrete Unit Masonry

4. Section 04 72 00 – Cast Stone

5. Section 07 13 26 – Self-Adhered Sheet Waterproofing

6. Section 07 24 19 – Water-Drainage Exterior Insulation Finish System (EIFS)

7. Section 07 52 16 – Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing

8. Section 07 62 00 – Sheet Metal Flashing and Trim

9. Section 07 92 00 – Joint Sealants

10. Section 08 42 13 – Aluminum Framed Entrances and Storefronts

11. Section 08 44 13 – Glazed Aluminum Curtain Walls

1.04 PERFORMANCE REQUIREMENTS

A. Air/water barrier (AWB) assemblies shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed at the bottom of the wall and each lintel and shelf angle to discharge water penetration to the exterior at floor lines and above penetrations (e.g., windows). AWB assemblies shall be detailed in a manner that accommodates substrate movement and is continuous across substrate expansion and control joints, construction material changes, and transitions at perimeter conditions (e.g., to windows) without deterioration or air leakage exceeding specified limits.

B. Install air/water barrier materials in shingle fashion to avoid “bucking” of water at seams.

1.05 SUBMITTALS

A. See Section 01 30 00 – Submittals for general submittal procedures.

B. Submit the following items in time to allow for review by the Engineer and resubmittals, if needed, without delaying the work. Do not order materials or start work before receiving the Engineer's written approval.

1. Product Data: For each item, submit information on the component materials, information on the construction and application details, information on the manufacturer’s recommendations for application and use, test data substantiating that products comply with requirements, and material safety data sheets.

2. Shop Drawings: After field measurement and documentation of all existing conditions, participate in the preparation of Shop Drawings, coordinated among all participatory trades, which establish and accommodate existing constraints and the variance in existing conditions. Provide complete drawings for each assembly and fabrication required for the project, showing exact profile, lengths, locations of joints, terminations, and methods of

attachment. Coordinate Shop Drawings with all relevant work of other trades specified in other Specification Sections.

3. Samples: Provide samples of the components listed in part two that will become part of the final assembly. Flashing samples shall be made to the exact profiles used for the project, 12 in. minimum length.

4. Certificates (in time to prevent delay of the work) by the producers of the materials that all materials supplied comply with all the requirements of these Specifications and the appropriate standards, and that all materials are compatible with the materials that they will be in contact with, and are suitable for the intended purpose.

5. Reports for tests performed by the manufacturer of the pre-manufactured membrane sheet flashing/air-barrier tie-in certifying compatibility with, and proper adhesion to, the membrane substrate.

1.06 MOCKUPS

A. Build in situ mockup of typical wall assembly with brick masonry, EIFS cladding, curtain wall, and roofing to demonstrate aesthetic effects, quality of materials, sequencing, transitions between materials and cladding, and execution. Mockups should include all typical exterior wall components, including air/water barrier, insulation, through-wall flashing, sealants, and other wall components. Refer to Section 01 45 00 – Mockups.

1.07 QUALITY ASSURANCE

A. Engage experienced waterproofing personnel to perform work of this Section. The Contractor shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance, for a period of at least 5 yrs. The contractor shall staff the work of this Section with only qualified personnel experienced in the application of this system.

B. Conduct a quality control program that includes, but is not limited to, the following:

1. Inspection of materials to assure conformity with contract requirements, and that materials are new and undamaged.

2. Establishment of procedures for executing the work.

3. Inspecting surface preparation prior to material application.

4. Inspection of work in progress to ensure work is being done in accordance with established procedures, manufacturer's instructions, and specific Engineer instructions.

5. Inspection of work completed and prompt correction of defective work.

C. Obtain each type of material from a single manufacturer for the duration of the project.

D. Work in conjunction with the other trades employed on the project by promptly completing the work of this Section as required to meet the project schedule and so as not to impede other trades. Coordinate the work of this Section with other trades so the intent of the Drawings and Specifications is carried out. Coordinate with other trades to maximize efficient use of scaffolding, to minimize disruption to the building, and to avoid unnecessary traffic over areas of completed work or existing to remain materials.

E. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the site only in manufacturer’s original containers, clearly marked with legible, intact labels with manufacturer's name and brand name and identifying contents of containers.

B. All materials to be new. Handle all materials to prevent damage. Place materials on pallets. Use waterproof and fireproof canvas tarpaulins (not plastic) to cover all stored materials top to bottom.

C. Protect all materials in original, unopened, labeled containers and packaging and in compliance with manufacturer’s directions. Comply with manufacturer’s recommendations for minimum and maximum time and temperature limits for storage.

D. Promptly remove from the site all materials rejected by the Engineer or exposed to any moisture anywhere, at any time, during transportation, storage, handling, or installation.

E. Do not stockpile materials or equipment to overload any building or site component.

F. Materials shall be marked with the date of manufacture and shelf life. Do not use products beyond the expiration of their shelf life. Store flammable materials in a cool, dry, protected area away from sparks and open flames.

1.09 PROJECT CONDITIONS

A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.

B. Field Measurements: Verify all site conditions and dimensions by field measurements before material fabrication or delivery and indicate measurements on Shop Drawings. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the contract drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work. Consider the special conditions associated with repairs to existing construction when measuring for shop drawings.

C. Coordination requirements: Coordinate installation with other trades, to help ensure proper installation sequencing for assemblies.

D. Protection

1. Protect the building and its contents, including interior finishes not part of the work area, from risks associated with the work in this Section. Schedule and execute work without exposing adjacent building areas to water, dust, and debris, or materials used by this Contractor. Protect adjacent areas from damage and stains with appropriate barriers and masking. Repair damage as a result of the work of this Section to its condition at the start of work, or if such cannot be determined, to its original condition. Clean stains by approved means.

2. Do not damage existing materials scheduled to remain. Provide adequate protection of all mechanical equipment to prevent breakage, scratches, staining, and any other damage during work associated with this Section.

3. Where work is performed above or near roofing surfaces, clean the work areas free of all debris including fasteners, scrap metal, and metal shards, on a daily basis. Notify the Engineer immediately if any damage to the existing or new waterproofing and roofing system is observed, regardless of the source of the damage. Ensure that all adjacent roofing is covered with plywood protection board with taped joints prior to commencing work in the area.

E. Schedule and execute all work to avoid exposing the building and its contents to inclement weather. Keep water out of the building at all times.

1.10 WARRANTY

A. Applicator Warranty: Guarantee work under this section in a document stating that if, within 2 yrs after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective, including sources found to be the cause of water intrusion into interior space, or not in accordance with the Contract Documents, the Applicator shall, at its sole cost and expense, correct it promptly after receipt of a written notice from the Owner to do so, unless the Owner has previously given the Applicator a written acceptance of such condition. Also, state that the Applicator shall bear costs incurred by the Owner, including reasonable attorney's fees, court costs, and expert witness and consultant fees, to enforce Applicator’s compliance with the obligations of this Guarantee. The obligations of this Guarantee shall run directly to the Owner and its successors and assigns, and may be enforced by the Owner and its successors and assigns against the Applicator, shall survive the termination of the Contract, and shall not be limited by conditions other than this contract.

B. Manufacturer’s Warranty: Provide air/water barrier manufacturer’s standard warranty for the air/water barrier system.

PART 2 – PRODUCTS

2.01 MANUFACTURER

A. Air and water barrier components and accessories must be obtained as a single-source from the manufacturer to ensure total system compatibility and integrity. If an alternate system is used, all accessory materials are subject to review and approval by the Engineer. Alternate components must meet or exceed the performance requirements of the basis-of-design. No other alternates or substitutions will be accepted.

1.	Basis-of-Design System:	Blueskin SA By Henry Company.
2.	Acceptable Alternatives:	Perm-A-Barrier Wall Membrane W.R. Grace & Co. CCW-705 Carlisle Coatings & Waterproofing Inc.

2.02 AIR AND WATER BARRIER MEMBRANE (BASIS-OF-DESIGN)

A. Sheet air/vapor barrier membrane: Blueskin SA manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a blue engineered thermoplastic film. Membrane shall have the following physical properties:

1. ASTM E2357: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies,

2. Air leakage: <0.0001 CFM/sq ft @1.6 lbs/sq ft to ASTM E2178 and ASTM E283 and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/sq ft for 1 hr and gust wind load pressure of 62.8 lbs/sq ft for 10 sec when tested at 1.6 lbs/sq ft to ASTM E331,

3. Vapor permeance: 0.03 perms to ASTM E96 (Desiccant Method),

4. Membrane Thickness: 0.0394 in. (40 mils),

5. Low temperature flexibility: -22ºF to CGSB 37-GP-56M,

6. Elongation: 200% to ASTM D412-modifed,

B. Low temperature air/vapor barrier membrane: Blueskin SA LT by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a blue engineered thermoplastic film for application temperatures between 40°F down to 10°F.

C. Membrane flashing at exposed areas: Foilskin by Henry; a SBS modified bitumen, self-adhering sheet membrane complete with surface layer of metallic aluminum film that many sealants adhere well to.

2.03 POLYURETHANE FOAM AIR BARRIER

A. Spray Foam Insulation (to form air barrier between top of CMU walls and underside of steep-slope roof deck): Two-component polyurethane foam system dispensed as a spray or stream, Handi-Foam Spray Foam by Fomo Products, Inc, or approved equal. The system shall comply with the following:

1. Class 1 foam.

2. Density: 1.75 lbs pcf, min.

3. Lath: Diamond Mesh Lath, galvanized, by AMICO Building Products or approved equal

B. Thermal Barrier Coating (for placement over spray foam insulation in concealed construction spaces): Polyurethane foam manufacturer recommended spray applied thermal barrier product for installation over spray foam, Handi-Foam Ignition Barrier by Fomo Products, Inc, or approved equal.

2.04 METAL FLASHING

A. See Section 07 62 00 – Sheet Metal Flashings and Trim

2.05 ACCESSORIES

A. Through-wall flashing Membrane: Blueskin TWF by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a yellow engineered thermoplastic film.

B. Primer for self-adhering membrane: Blueskin Adhesive by Henry; a synthetic rubber based adhesive, quick setting, having the following physical properties. Water-based primers are not permitted:

1. Color: Blue,

2. Weight: 6 lbs/gal,

3. Solids by weight: 35%,

4. Drying time (initial set): 30 min.

5. Application temperatures: 10°F and rising

C. Penetration, Termination, and Lap Sealant: HE925 BES Sealant by Henry; a moisture-curing medium modulus polymer modified STPe sealant compatible with self-adhered air/water barrier membranes.

D. Termination Bar: Continuous aluminum termination bar, pre-punched at 6 in. o.c.

E. Fasteners for Termination Bar: 1/4 in. dia. Nylon Nailin with stainless steel nail and mushroom head by Rawl Powers Inc., New Rochelle, New York, with length to

provide a minimum of 1-1/4 in. embedment, or as specified in Section 07 62 00 – Sheet Metal Flashing and Trim.

F. Termination and Lap Sealant at Rough Openings: Air-Bloc LF by Henry; a moisture-curing single component STPe liquid-applied flashing compatible with self-adhered air/water barrier membranes and fenestration perimeter sealant.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Contract Drawings.

B. Examine all surfaces to receive air/water barrier for roughness, contaminants, unsound structural substrates, or other conditions that may impair the application. Notify the General Contractor and Engineer in writing of any such conditions; do not commence work until all defects are remedied.

3.02 SUBSTRATE PREPARATION

A. Refer to manufacturer's literature for requirements for preparation of substrates. Surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces.

B. Remove dust, dirt, loose stucco and debris from all new and existing substrates. Substrate preparation may involve power washing and/or mechanical abrasion, as determined by the Contractor's means and methods. Refer to Section 02 41 19 – Selective Demolition.

C. Ensure all Work relating to the backup wall substrate, including repairs to the existing direct-applied stucco, is complete and properly cured prior to applying the primary air/water barrier membrane.

D. Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.

3.03 GENERAL SELF-ADHERED MEMBRANE INSTALLATION

A. Primer

1. Prime all surfaces to receive air/water barrier. Apply primer only to the area to be covered with membrane during the current working day. Apply primer with a roller or brush at the rate recommended by the manufacturer. Do not spray.

2. Primed surfaces not covered by waterproofing membrane during the same working day must be re-primed.

3. Follow all manufacturer's recommended safety precautions and installation instructions when applying the primer and membrane, including no smoking, open flame or sparks in the work area during installation. Notify Engineer if safety precautions cannot be reasonably met at specific locations on the building.

B. Membrane Installation

1. Install air/water barrier as shown on the drawings. Apply sheets in longest lengths practical, and ensure minimum 2 in. overlap at all end and side laps of membrane, or as required by the membrane manufacturer. Shingle laps so they do not "buck" water. Stagger all vertical joints.

2. Roll membrane onto primed surfaces, pulling release paper in front of roll such that once release paper is removed, membrane is immediately set onto surface. Place sheets without fishmouths or wrinkles. Do not stretch the membrane.

3. If fishmouths or wrinkles appear, cut out and flatten the affected area, and cover with membrane extending at least 6 in. beyond the cut on all sides; orient patch in a diamond-shape to limit water from bucking along the top edge.

4. Immediately after applying membrane sheet, hand press into contact with the substrate and roll entire membrane toward the lap seams with a hand-held neoprene roller.

5. Seal all membrane seams, laps, perimeter edges, termination bars, fasteners, and miscellaneous membrane penetration or termination details with manufacturer's specified sealant.

C. Transitions

1. At transition areas such as curbs, and through-wall flashings, etc. prime surfaces per the manufacturer's instructions. Align and position self-adhered membrane; remove protective film and press flashing firmly into place. Ensure membrane laps 3 in. onto all substrates, 2 in. overlap at all side laps, and 3 in. overlap at all end laps of the membrane. Roll all laps and membrane with a counter top roller.

D. Windows and Rough Openings

1. Extend air/water barrier membrane into all rough openings beyond the interior fenestration air seal, as shown in the Drawings.

2. Provide membrane patches at all three-way corners in the substrate to eliminate pinholes in the membrane assembly.

3. Seal all membrane edges and seams with the termination and lap sealant that is compatible with the silicone sealant that will be installed around the window perimeters.

E. Through-wall Flashing Membrane

1. Apply through-wall flashing membrane along the base of masonry veneer walls and where shown in the Drawings.

2. Prime surfaces and allow to dry, press membrane firmly into place, overlap minimum 2 in. at all end and side laps. Promptly roll all laps and membrane to ensure the seal.

3. Applications shall form a continuous flashing membrane and shall extend up a minimum of 8 in. up the backup wall.

4. Seal the top edge of the membrane where it meets the substrate using termination sealant. Trowel-apply a feathered edge to seal termination to shed water.

5. Shingle-lap the primary air/water barrier membrane over the top edge of the through-wall flashing.

6. Install through-wall flashing membrane and extend 1/2 in. inboard from outside edge of veneer. Provide end dam flashing at all rough openings, changes in substrate, and where shown in the Drawings.

F. Coordinate membrane installation with insulation installation, installation of EIFS accessories specified in Section 07 24 19 – Drainable Exterior Insulation and Finish System, and flashing installation specified in Section 07 62 00 – Sheet Metal Flashing and Trim.

3.04 INSTALL FOAM INSULATION/FILLER TO SEAL TOP OF CMU WALLS

A. Provide foam insulation/filler between top of partition wall and sheet metal transition strip on underside of metal deck.

B. Provide foam insulation/filler in top and bottom flutes of metal deck above partition wall. Encapsulate foam insulation/filler with sheet metal transition strips.

C. Perform all required surface preparation and provide all manufacturer accessories to adhere or attach foam insulation/filler to the metal deck and/or sheet metal transition strips.

3.05 CLEANING AND PROTECTION

A. Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed work.

B. Promptly as the work proceeds and on completion clean up and remove from site all rubbish and surplus materials resulting from the foregoing work.

C. Protect completed membrane waterproofing from subsequent construction activities, including backfilling, as recommended by manufacturer.

D. Provide protection of installed materials from water infiltration into or behind them.

E. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.

3.06 SITE QUALITY CONTROL

A. Adhesion Testing: Contractor shall test for membrane adhesion in compliance with ASTM D4541.

1. Perform all testing prior to applying the metal lath and EIFS assembly. Coordinate all testing with other trades to ensure adequate time is provided to remediate test area and address deficiencies in installation or surface preparation, if necessary.

2. Perform a minimum of one test for every 250 lf of building footprint where the air/water barrier system is applied, with a minimum of one test per primary building elevation. Test shall be evenly distributed throughout the construction area, substrate materials, and construction schedule.

3. In addition to the testing protocol described above, one test shall be conducted on the in-situ mockup and observed by the Engineer.

4. Conduct an additional test, not included in the testing described above, at each area where surface preparation or primer differs from the tested and approved mockup construction.

5. The test shall be considered failed if the adhesion is less than 9 psi or if the backup wall substrate delaminates prior to the membrane debonding from the substrate. Remediate all failed test areas and retest the membrane in that area; repeat in this manner until the area passes the test.

6. Repairs or remediation measures conducted shall pass testing, and if they constitute a change to design, the change shall be implemented throughout Work as determined by the Engineer.

7. Installer shall patch and repair all test areas according to the Contract Documents.

8. Contractor shall submit written and illustrated reports of testing results for the Engineer’s information.

9. All testing costs shall be paid by the Contractor.

END OF SECTION