SECTION 07 27 20 – SHEET MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 CONTROLLING DOCUMENTS

A. This specification is controlled by Division 08 Section "Exterior Enclosure System Requirements". In addition to the requirements of this document, all requirements of Controlling Documents must also be met. The more onerous conditions of this document or the Controlling Document must be met.

1.2 SUMMARY

A. Provide the requirements of this Section in accordance with requirements of the Contract Documents.

B. This Section includes, but is not limited to the following:

1. Vapor retarding sheet air barriers **AB-03**.
2. Vapor permeable sheet air barriers **AB-04**.

C. Related Work:

1. Division 03, Section 03 30 00 "Cast-In-Place Concrete".
2. Division 04, Section 04 20 00 "Unit Masonry" for embedded flashings.
3. Division 06, Section 06 16 00 “Sheathing” for wall sheathing and sheathing joint-and-penetration treatments. Joint treatment components shall be compatible with air and water barrier assembly.
4. Division 07, Section 07 21 00 "Thermal Insulation" for board and batt thermal insulation.
5. Division 07, Section 07 27 26 “Fluid Applied Air and Water Barriers” for liquid applied air-barriers.
6. Division 07, Section 07 21 80 "Fluid Applied Thermal Insulation" for aerogel type liquid applied thermal insulation.
7. Division 07, Section 07 62 00 "Sheet Metal Flashing and Trim" for sheet flashings.
8. Division 07, Section 07 52 16 “Modified Bituminous Membrane Roofing” for roof vapor barriers.
9. Division 07, Section 07 72 00 "Roof Accessories".
10. Division 07, Section 07 92 00 "Joint Sealants" for joint-sealant materials and installation.

1.3 DEFINITIONS

A. ABAA: Air Barrier Association of America.

B. Air and Water Barrier Material: A primary element that provides a continuous barrier to the movement of air.

C. Air and Water Barrier Accessory: A transitional component of the air barrier that provides continuity.

D. Air and Water Barrier Assembly: The collection of air and water barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

E. Air-Barrier System: The combination of air-barrier assemblies installed to provide a continuous barrier to the movement of air through building enclosures. This term applies to the whole building.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Agenda: Review air-barrier requirements and installation procedures, including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, sequence of installation, special details and fluid applied and sheet membrane flashings, mockups, air-leakage and bond testing and special inspection procedures, air-barrier protection and repair recommendations, and work scheduling that covers air barriers.
2. Attendees: Include installers of other construction connecting to air barrier, including roofing, masonry, sealants, glazed curtain walls, and door frames.

1.5 ACTION SUBMITTALS

A. Product Data: Manufacturer's technical literature for each product and system indicated.

1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; and tested physical and performance properties of products.
2. Include data on air and water-vapor permanence based on testing according to referenced standards.

B. Shop Drawings: For air-barrier assemblies.

1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions.
2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
3. Include details of interfaces with other materials that form part of air barrier.
4. Include details of mockups

C. Shop Drawings of Mock-Up: Submit shop drawings of proposed mock-ups showing plans, elevations, large-scale details, and connections to the test apparatus.

D. Sustainable Design Submittals:

1. Indoor Environmental Quality, Low Emitting Materials: Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method V1.1-2010 or v1.2 2017, using the applicable exposure scenario.

    a. Adhesives and Sealants: For wet applied on-site products, submit printed statement showing compliance with the applicable chemical content requirements of SCAQMD Rule 1168, effective July 1, 2005 and rule amendment date of January 7, 2005.

1.6 INFORMATIONAL SUBMITTALS

A. Installer Qualifications: Provide letter for air-barrier manufacturer indicating that installer is trained and approve by manufacturer. Include list of ABAA-certified installers and supervisors employed by Installer, who work on Project.

B. Manufacturer's Technical Representative: For each system installed, provide manufacturer's technical representative on site to observe the first 5 days of installation, observe 5 other full days on installation, inspect completed installations, and provide written acceptance of each completed installation.

C. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come into contact with the barrier.

D. Warranty: Provide manufacturer's written warranty covering materials and installation (labor) stating obligations, remedies, limitations, and exclusions.

E. Field Quality Control Reports: Written report of testing and inspection required by "Field Quality Control".

F. Sustainable Design Submittals:

1. Building Product Disclosure and Optimization - Environmental Product Declarations

a. Submit product specific type III EPDs or Industry wide (generic) EPDs, USGBC approved program declaration or products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.

2. Building Product Disclosure and Optimization - Material Ingredients

a. Material Ingredient Reporting: Submit documentation confirming chemical inventory of products to at least 0.1 % (1000pm) with at least one of the following:

1) Submit published manufacturer inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
2) Submit documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
3) Submit Declare product label indicating that all ingredients have been disclosed down to 1000 ppm or designated as Red List Free or Declared
4) Living Product Challenge
5) Product Lens Certification
6) USGBC approved program.

b. Material Ingredient Optimization: Submit documentation confirming chemical inventory of products to at least 0.01 % (100pm) and/or that has a compliant material ingredient optimization report with at least one of the following:

1) Submit GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
2) Submit third-party verified documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
3) Submit third-party verified Cradle to Cradle v3 Material Health certificate at the Bronze Level or better
4) Submit third-party verified Declare product label indicating that all ingredients have been disclosed down to 100 ppm
5) Submit third-party verified documentation that product is Living Product Challenge certified with a Red List Free or LBC Red List Free Declare label.
6) Submit documentation that product has a manufacturer prepared action plan with material inventory to at least 1000 ppm.

1.7 QUALITY ASSURANCE

A. Manufacturer: Company with full time technical representatives that can attend preinstallation meetings, field testing, first installation and periodically during installation to ensure that installation is acceptable for manufacturer warranty.

B. Installer Qualifications: An entity with a minimum of 5 year successful experience applying specified air barrier materials on projects of equivalent size and scope, and that employs installers and supervisors who are trained and approved by manufacturer.

1. Manufacturer Acceptance: Installer shall be certified, approved, licensed, or acceptable to manufacturer to install products and licenses by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.

C. Mock-ups: Prior to fabrication and installation, build mock-up for each form of construction and finish required to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mock-up using materials indicated for the completed Work.

1. Build mock-up in the location and of the size indicated or, if not indicated, as directed by Architect. Contractor shall provide structural support framework.

    a. Build integrated mockups of exterior wall assembly, incorporating backup wall construction, external cladding, glazed aluminum framing, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air and water barriers, and sealing of gaps, terminations, and penetrations of air and water barrier assembly.
    b. If indicated, coordinate construction of mockups to permit inspection by Owner's testing agency of air and water barrier before external insulation and cladding are installed.
    c. Include junction with roofing membrane, building corners and, foundations.

2. Notify Architect seven days in advance of the dates and times when mock-up will be installed.
3. Obtain Architect's acceptance of mock-ups before starting fabrication or installation.
4. Acceptance of mock-ups does not constitute acceptance of deviations from the Contract Documents contained in mock-ups unless such deviations are specifically noted by Contractor and accepted by Architect in writing.
5. Demolish and remove mock-ups when directed by Architect unless accepted to become part of the completed Work.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Owner may engage a qualified testing agency to perform preconstruction testing on field mockups

B. Mockup Testing: Air-barrier assemblies shall comply with performance requirements indicated, as evidenced by reports based on mockup testing by a qualified testing agency.

1. Air Leakage Volume Testing - Assembly: Mock-ups shall be tested for air-leakage rate according to ASTM E 783 or ASTM E 2357.
2. Adhesion Testing: Mock-ups shall be tested for air-barrier adhesion according to ASTM D 4541.

C. Laboratory Mockup Testing: Coordinate with Division 08, Section 08 40 00 "Exterior Wall System Requirements" for integrated laboratory testing mockup requirements.

1. Notify Architect seven days in advance of the dates and times when laboratory mockups will be tested.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier manufacturer.

B. Remove and replace liquid materials that cannot be applied within their stated shelf life.

C. Protect stored materials from direct sunlight.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.

1. Protect substrates from environmental conditions that affect air-barrier performance.
2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.11 COORDINATION

A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

1.12 WARRANTY

A. Manufacturer's Warranty: Furnish manufacturer's written material and labor warranty signed by an authorized representative using manufacturer's standard form agreeing to furnish materials and labor required to repair or replace work which exhibits material defects caused by manufacture or design of product. "Defects" are defined to include but not limited to deterioration or failure to perform as required.

1. Warranty Period: Manufacturer shall warrant the products to be free from material and labor Defects for a period of 5 years from date of Substantial Completion.

B. Installer's Warranty: Furnish installer's written workmanship warranty signed by an authorized representative using installer's standard form agreeing to provide labor required to repair or replace work which exhibits workmanship defects. "Defects" is defined to include but not limited to deterioration or failure to perform as required.

1. Warranty Period: Installer shall warrant the installation to be free from workmanship Defects for a period of 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, provide product by one of manufacturers listed. If not listed, submit as substitution according to Conditions of the Contract and Division 01 Section 01 25 13 "Product Substitution Procedures".

2.2 MATERIALS

A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.3 PERFORMANCE REQUIREMENTS

A. General: Air barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration.

1. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
2. Air barrier membranes shall be compatible with substrates, including glass faced gypsum sheathing, concrete masonry units, concrete, preservative treated plywood sheathing, and fire-retardant treated cants, blocking, and furring strips.

B. Air-Barrier Air Leakage - Assembly: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa), when tested according to ASTM E 2357.

C. Low-Emitting Materials:

1. Adhesives and Sealants wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.
2. All adhesives and sealants wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01, Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C."

2.4 SHEET MEMBRANE AIR BARRIERS, VAPOR RETARDING

A. Modified Bituminous Sheet, Vapor Retarding **AB-03**: Minimum 40-mil-thick, self-adhering sheet consisting of rubberized asphalt laminated to a cross-laminated polyethylene film with release liner on adhesive side and formulated for application with primer that complies with VOC limits.

1. Products: Subject to compliance with requirements, provide one of the following:
    a. Carlisle Coatings & Waterproofing Inc; CCW-705.
    b. GCP Applied Technologies Inc. (formerly Grace Construction Products); Perm-A-Barrier Wall Membrane.
    c. Henry Company; Blueskin SA.
    d. W. R. Meadows, Inc; Air-Shield.

2. Physical and Performance Properties:

   a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference; ASTM E2178.
   b. Tensile Strength: Minimum 250 psi (1.7 MPa); ASTM D412, Die C.
   c. Ultimate Elongation: Minimum 200 percent; ASTM D412, Die C.
   d. Puncture Resistance: Minimum 40 lbf (180 N); ASTM E154/E154M.
   e. Water Absorption: Maximum 0.15 percent weight gain after 48-hour immersion at 70 deg F(21 deg C); ASTM D570.
   f. Vapor Permeance: Maximum 0.1 perm **(**57.5 ng/Pa x s x sq. m); ASTM E96/E96M, Desiccant Method, Procedure A, or maximum 0.1 perm (57.5 ng/Pa x s x sq. m); ASTM E96/E96M, Wet Method, Procedure B
   g. Adhesion to Substrate: Minimum 16 lbf/sq. in. (110 kPa) when tested according to ASTM D4541 as modified by ABAA.
   h. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
   i. UV Resistance: Can be exposed to sunlight for 45 days according to manufacturer's written instructions.

2.5 SHEET MEMBRANE AIR BARRIERS, VAPOR PERMEABLE

A. Nonbituminous Sheet Vapor-Permeable (**AB-04**): Minimum 20-mil-thick, self-adhering sheet consisting of a breathable carrier film or fabric and an adhesive with release liner on adhesive side and formulated for application with primer that complies with VOC limits.

1. Products: Subject to compliance with requirements, provide one of the following:

   a. Carlisle Coatings & Waterproofing Inc; Fire Resist 705 VP.
   b. GCP Applied Technologies Inc. (formerly Grace Construction Products); Perm-A-Barrier VPS.
   c. Henry Company; Blueskin VP160
   d. W. R. Meadows, Inc; Air-Shield SMP

2. Physical and Performance Properties:

   a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa) pressure difference; ASTM E2178.
   b. Vapor Permeance: Minimum 15 perms; ASTM E96/E96M, Desiccant Method, Procedure A, or minimum 10 perms; ASTM E96, Wet Method, Procedure B.
   c. Adhesion to Substrate: Minimum 15 lbf/sq. in. (103 kPa) when tested according to ASTM D4541 as modified by ABAA.
   d. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
   e. UV Resistance: Can be exposed to sunlight for 150 days according to manufacturer's written instructions.

2.6 ACCESSORY MATERIALS

A. General: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer.

C. Stainless-Steel Sheet Flashing: ASTM A240/A240M, Type 304, 0.0250 inch (0.64 mm) thick, and Series 300 stainless-steel fasteners.

D. Preformed Silicone Extrusion Flashing: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; Dow Corning® 123 Silicone Seal.
b. GE Construction Sealants; Momentive Performance Materials Inc.; US11000 UltraSpan.
c. Pecora Corporation; Sil-Span.

E. Provide joint sealants that are compatible with membrane and adjacent materials, comply with requirements specified in Division 07, Section 07 92 00 “Joint Sealants” and that are recommended by selected manufacturer of membrane air barriers for intended use.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
3. Verify that substrates are visibly dry and free of moisture. Test concrete substrates for capillary moisture by plastic sheet method according to ASTM D4263.
4. Verify that masonry joints are flush and completely filled with mortar.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer’s written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.

E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

H. Bridge joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

I. Masonry joints shall be struck flush and cracks greater than crack bridging ability shall be filled (routed and filled where necessary) prior to application of membrane to the surface.

J. Sheathing joints shall be treated in accordance with manufacturer installation details.

1. Treat and seal all screw penetrations. Allow treatment to cure before installation of air and water barrier membrane.

3.3 INSTALLATION, GENERAL

A. Install materials according to air-barrier manufacturer's written instructions and details and according to recommendations in ASTM D6135 to form a seal with adjacent construction and ensure continuity of air and water barrier.

1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous air-barrier membranes produced for low-temperature application. Do not install low-temperature membrane if ambient or substrate temperature is higher than 60 deg F.
2. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.

B. Prepare, treat, and seal inside and outside corners and vertical and horizontal surfaces at terminations and penetrations with termination mastic and according to ASTM D6135.

3.4 ACCESSORIES INSTALLATION

A. Install transition strips and accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.

1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate.
3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.

a. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials as required to provide continuity of air barrier.

C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.

D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

E. Wall Openings: Prime concealed, perimeter frame surfaces of curtain walls, storefronts, and doors. Apply transition strip or preformed silicone extrusion so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames, with not less than 1 inch (25 mm) of full contact.

1. Transition Strip: Roll firmly to enhance adhesion.
2. Preformed Silicone Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air and water barrier material. Roll firmly to enhance adhesion.

F. Install membranes bottom up, in a method recommended by manufacture to shingle and direct water away from openings. Use manufacturer's prefabricated inside and outside corners. Apply 8 in wide air barrier transition strips extending 4 inches onto sides of frames and 4 inches onto adjacent sheathing substrates. Apply manufacturer's recommended silicone sealant/adhesive to overlap a minimum of 1 inch at junctures between preformed corners and vertical/horizontal transitions. Apply silicone lap sealant over exposed edges and on cavity side of flashing sheet. Verify that overlaps are bonded with silicone and that laps are fully embedded without fishmouths, skips, or misalignments of any kind.

G. Fill gaps in perimeter frame surfaces of curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.

H. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.

I. Seal top of through-wall flashings to air barrier with an additional 6-inch- (150-mm-) wide, transition strip.

J. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

K. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction. At fasteners and other penetrations required to support exterior wall panels and skins, apply manufacturer recommended seals necessary to maintain continuity of air barriers.

3.5 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

A. General: Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.

1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.

4. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

B. Sheet Membrane Application: Apply and firmly adhere air-barrier sheets over area to receive air barrier. Accurately align sheets and maintain uniform 2-1/2-inch-minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.

1. Apply sheets in a shingled manner to shed water.
2. Roll sheets firmly to enhance adhesion to substrate.

C. Apply continuous air-barrier sheets over accessory strips bridging substrate cracks, construction, and contraction joints.

D. CMU: Install air-barrier sheet horizontally against the CMU beginning at base of wall. Align top edge of air-barrier sheet immediately below protruding masonry ties or joint reinforcement or ties, and firmly adhere in place.

1. Overlap horizontally adjacent sheets a minimum of 2 inches and roll seams.
2. Apply overlapping sheets with bottom edge slit to fit around masonry reinforcing or ties. Roll firmly into place.
3. Seal around masonry reinforcing or ties and penetrations with termination mastic.
4. Continue the sheet into all openings in the wall, such as doors, and terminate at points to maintain an airtight barrier that is not visible from interior.

E. Seal top of through-wall flashings to air-barrier sheet with an additional 6-inch-wide, transition strip.

F. Seal exposed edges of sheet at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

G. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending 6 inches beyond repaired areas in all directions.

H. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

I. Do not cover air barrier until it has been tested and inspected by testing agency.

J. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.6 FIELD QUALITY CONTROL

A. Manufacturer’s Field Service: Manufacturer’s qualified technical representative shall periodically inspect Work to ensure installation is proceeding in accordance with manufacturer’s designs, recommendations, instructions, and warranty requirements. Representative shall submit written reports of each visit indicating observations, findings, and conclusions of inspection.

1. Manufacturer’s Technical Representative Qualifications: Direct employee of technical services department of manufacturer with experience in providing recommendations, observations, evaluations, and problem diagnostics.

B. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program. ABAA audit inspection and testing is performed at the following rate:

1. Up to 10,000 Sq. Ft. of Air Barrier: One audit.
2. 10,000 to 35,000 Sq. Ft. of Air Barrier: Two audits.
3. 35,000 to 75,000 Sq. Ft. of Air Barrier: Three audits.
4. 75,000 to 125,000 Sq. Ft. of Air Barrier: Four audits.
5. 125,000 to 200,000 Sq. Ft. of Air Barrier: Five audits.
6. 200,000 Sq. Ft. and Over of Air Barrier: Six audits.

C. Testing Agency: The Owner may employ and pay a qualified testing agency to perform tests and inspections in compliance with local Energy Code requirements for air sealing and insulation visual inspection.

1. Coordinate with Division 08, Section 08 40 00 "Exterior Enclosure System Requirements" for other required testing, and with Division 01 "Building Enclosure Commissioning Requirements" for commissioning of exterior walls.

D. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:

1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
2. Continuous structural support of air-barrier system has been provided.
3. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
4. Site conditions for application temperature and dryness of substrates have been maintained.
5. Maximum exposure time of materials to UV deterioration has not been exceeded.
6. Surfaces have been primed, if applicable.
7. Laps in sheet materials, strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
8. Termination mastic has been applied on cut edges.
9. Sheets, Strips and transition strips have been firmly adhered to substrate.
10. Compatible materials have been used.
11. Transitions at changes in direction and structural support at gaps have been provided.
12. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
13. All penetrations have been sealed.
14. Dry film thickness of installed membrane

E. Tests: Field testing shall be performed on the first installation of air barriers. Testing requirements shall be determined by testing agency from among the following tests:

1. Air Leakage Volume Testing - Assembly: Air-barrier assemblies tested according to ASTM E 2357.
2. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D 4541 for each 600 sq. ft. (56 sq. m) of installed air barrier or part thereof. Each test is an average of three pulls within a 3 meter area, with the following conditions requiring additional pull tests:

    a. When there is a crew change during installation.
    b. When there was a weather change that could affect adhesion of air barriers.
    c. If formulation changed (due to weather or other reasons).

d. If there are multiple substrate types, each substrate requires separate testing.
e. Frequency of testing may be increased or reduced based on track record of leaks/failures reported by ABAA inspections at the discretion of the Architect.

F. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Document repair/recommendations of Owner's testing agency and manufacturer's representative to use on balance of installations.
3. Remove and replace deficient air-barrier components for retesting as specified above.

G. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

H. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

C. Remove masking materials after installation.

END OF SECTION