SECTION 07 27 26 - FLUID-APPLIED AIR AND WATER BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Fluid applied air and water barriers located within exterior wall assemblies; and supplementary items necessary for installation.

1. Fluid applied air and water barrier - vapor permeable **AB-01**.
2. Fluid applied air and water barrier - vapor retarder **AB-02.**

B. 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 21 80 "Fluid Applied Thermal Insulation" for aerogel type liquid applied thermal insulation.
6. Division 07, Section 07 27 20 “Sheet Membrane Air Barriers” for liquid applied air-barriers.
7. Division 07, Section 07 52 16 “Modified Bituminous Membrane Roofing” for roof vapor barriers.
8. Division 07, Section 07 62 00 "Sheet Metal Flashing and Trim" for sheet flashings.
9. Division 07, Section 07 72 00 "Roof Accessories".
10. Division 07, Section 07 92 00 "Joint Sealants" for joint-sealant materials and installation.

1.2 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.

1.3 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; dry film thickness; and tested physical and performance properties of products.
2. Include data on air and water-vapor permanence based on testing according to referenced standards.
3. Include VOC content of each material, and applicable legal limit in the jurisdiction of the project.

B. Shop Drawings: For air and water barrier assemblies.

1. Show locations and extent of air and water barrier assemblies and details of typical and project specific conditions.

a. Include recommended values for field adhesion test on each substrate.

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.

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.

1.4 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 Project Acceptance Document: Certification by the manufacturer that its products and systems are approved, acceptable, suitable for use in specific locations, for specific details, and for applications indicated, specified, or required, and that a warranty will be issued.

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

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

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

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.

1.5 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:

1. Experience: Installer's personnel with not less than 5 years of experience in the successful performance of Work similar to scope of this Project.

2. Supervision: Installer shall maintain a competent supervisor at Project while the Work is in progress, and who has not less than 5 years of experience installing products and systems similar to scope of this Project.
3. 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.

1.6 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.

1.7 PRE-INSTALLATION CONFERENCE

A. Pre-Installation Conference: Before Work begins, conduct conference at Project site.

1. Participants:

   a. Architect.
   b. Contractor, including superintendent.
   c. Installer, including project manager and supervisor.
   d. Manufacturer's qualified technical representative.
   e. Installers of other construction interfaced with Work.

2. Minimum Agenda: Installer shall demonstrate understanding of the Work required by describing detailed procedures for preparing, installing, and cleaning the Work. Demonstration shall include, but not be limited to, following topics:

   a. Tour representative areas of Work, inspect and discuss condition of substrate, and other preparatory work performed by other trades.
   b. Review Contract Document requirements.
   c. Review approved submittals.
   d. Review inspection and testing requirements.
   e. Review environmental conditions and procedures for coping with unfavorable conditions.
   f. Resolve deviations or differences between Contract Documents and the manufacturer's specifications.

3. Record discussions, including decisions and agreements, and prepare report.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturers original, unopened, undamaged containers with identification labels intact.

B. Store materials as recommended by manufacturer.

1.9 PROJECT CONDITIONS

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

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

1.10 COORDINATION

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

1.11 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, GENERAL

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

2.3 PERFORMANCE REQUIREMENTS

A. General: Air and water barrier assembly and seals with adjacent construction shall be capable of per-forming as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior. Air and water barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to embedded flashing, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

1. Assembly shall perform as a drainage plane flashed to discharge condensation or water penetration to the exterior.
2. Assembly shall accommodate movements of building materials by providing expansion and control joints as required, with accessory air and water seal materials at such locations, changes in substrate and perimeter conditions.

3. Assembly shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement and shall transfer the load to the structure.
4. Assembly shall not displace adjacent materials under full load.
5. Assembly shall be joined in an airtight and flexible manner to the air and water barrier material of adjacent assemblies, allowing for the relative movement of assemblies due to thermal and moisture variations and creep, and anticipated seismic movement.

B. Connections to Adjacent Materials: Provide connections to prevent air leakage and water migration at the following locations:

1. Foundation and walls, including penetrations, ties and anchors
2. Walls, curtain walls, storefronts, louvers or doors.
3. Different wall assemblies and fixed openings within those assemblies.
4. Wall and roof connections.
5. Floors over unconditioned space.
6. Walls, floor and roof across construction, control and expansion joints.
7. Walls, floors and roof to utility, pipe and duct penetrations.
8. Seismic and expansion joints.
9. Other leakage pathways in the building envelope.

C. 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.

D. 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 FLUID APPLIED MEMBRANE AIR AND WATER BARRIER –VAPOR PERMEABLE

A. High-Build, Vapor-Permeable Air Barrier **AB-01**: Synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 25 mils (0.6 mm) or thicker over smooth, void-free substrates.

1. Synthetic Polymer Type:

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

1) Carlisle Coatings & Waterproofing; Barritech VP.
2) GCP Applied Technologies Inc (formerlay Grace Construction Products); W.R. Grace & Co. -- Conn.; Perm-A-Barrier VPL
3) Henry Company, Sealants Division; Air-Bloc 17MR
4) W. R. Meadows, Inc; Air-Shield LMP

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 E 2178.

b. Vapor Permeance: Minimum 10 perms (580 ng/Pa x s x sq. m); ASTM E 96/E 96M, Wet Method, Procedure B.
c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
d. Adhesion to Substrate: Minimum 16 lbf/sq. in. (110 kPa) when tested according to ASTM D 4541.
e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
f. UV Resistance: Can be exposed to sunlight for 180 days according to manufacturer's written instructions.

2.5 FLUID APPLIED MEMBRANE AIR AND WATER BARRIER –VAPOR RETARDER

A. Vapor-Retarder Air and Water Barrier **AB-02**: Modified bituminous or synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils (0.9 mm) or thicker over smooth, void-free substrates.

1. Synthetic Polymer Type:

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

1) Carlisle Coatings & Waterproofing Inc; Fire Resist Barritech NP.
2) GCP Applied Technologies Inc. (formerly Grace Construction Products); W.R. Grace & Co. -- Conn.; Perm-A-Barrier NPL 10.
3) Henry Company; Air-Bloc 16MR.
4) W. R. Meadows, Inc; Air-Shield LSR.
5) Tremco Commercial Sealants & Waterproofing; ExoAir 230

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 E 2178.
b. Vapor Permeance: Maximum 0.1 perm (5.8 ng/Pa x s x sq. m); ASTM E 96/E 96M, Desiccant Method.
c. Ultimate Elongation: Minimum 500 percent; ASTM D 412, Die C.
d. Adhesion to Substrate: Minimum 16 lbf/sq. in. (110 kPa) when tested according to ASTM D 4541.
e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
f. UV Resistance: Can be exposed to sunlight for 90 days according to manufacturer's written instructions.

2.6 ACCESSORY MATERIALS

A. General: Provide compatible accessory materials recommended by air and water barrier manufacturer to produce a complete air and water barrier assembly.

1. 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 and water barrier manufacturer to produce a complete air and water barrier assembly and that are

compatible with primary air and water 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 stain-less-steel fasteners.

D. Preformed Silicone Extrusion: 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 fluid applied membrane air barriers for intended use.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and as-sociated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

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 period recommended by air and water barrier manufacturer.
3. Verify that substrates are visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.
4. Verify that masonry joints are flush and filled completely with mortar.
5. Verify sealants and joint treatments used in sheathing are compatible with membrane.

3.2 INSTALLATION, GENERAL

A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:

1. Respective Manufacturer's written installation instructions.
2. Accepted submittals.
3. Contract Documents.

3.3 PREPARATION

A. General: Comply with manufacturer's instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

B. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air and water barrier application.

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

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

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

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

G. 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.

H. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another to pro-vide continuous support for air and water barrier.

I. 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.

J. 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.

K. 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.

3.4 ACCESSORIES INSTALLATION

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

1. Coordinate the installation of air and water barrier with installation of roofing membrane and base flashing to ensure continuity of air and water 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 and water barrier material on same day. Re-prime areas exposed for more than 24 hours.

B. Connect and seal exterior wall air and water barrier material continuously to roofing-membrane air and water 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.

C. One-Piece Electrical Box: Install in accordance with manufacturer's recommendations. Cover shall project from face of wall surface enough to allow hinged cover to fully open for access.

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

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

F. 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.

G. Fill gaps in perimeter frame surfaces of curtain walls, storefronts, and doors, and miscellaneous penetrations of air and water 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 counter-flashings or ending in reglets with termination mastic

K. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fish mouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction

L. Anchors and Fasteners: Install a strip of barrier flashing tape behind through-wall attachments, including masonry veneer anchors, that penetrate air and water barrier.

3.5 AIR AND WATER BARRIER MEMBRANE INSTALLATION

A. Apply air and water barrier material to form a seal with strips and transition strips and to achieve a continuous air and water barrier according to air and water barrier manufacturer's written instructions and de-tails. Apply air and water 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 and water barrier material on same day. Re-prime areas exposed for more than 24 hours.
3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.

B. Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply an increased thickness of air-barrier material in full contact around protrusions such as masonry ties

1. Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, applied in one or more equal coats. Apply additional material as needed to achieve void- and pinhole-free surface, but do not exceed thickness on which required vapor permeability is based

C. Transition and Detailing Treatment: Install appropriate materials to treat sheathing joints, expansion joints, drift joints, rough openings, transitions, terminations, penetrations and similar surface irregularities. Transitions and detailing can be performed before or after air and water barrier membrane application. Ensure installation is performed in accordance with manufacturers written installation instructions and details.

D. Do not cover air and water barrier until it has been tested and inspected by Owner's testing agency.

E. Correct deficiencies in or remove air and water barrier that does not comply with requirements; repair substrates and reapply air and water 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 independent testing agency to perform field quality control and inspections in compliance with local Energy Code requirements for air sealing and insulation visual inspection. Materials and installation failing to meet specified requirements shall be replaced at Contractor's expense. Retesting of materials and installations failing to meet specified requirements shall be done at Contractor's expense.

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

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

E. Tests: Field testing shall be performed on the first installation of fluid applied 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. Repair testing area according to manufacturer's written instructions, where inspection results indicate insufficient thickness.

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

1. Apply additional air and water barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Remove and replace deficient air and water barrier components for retesting as specified above.

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

H. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

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

1. Protect air and water barrier from exposure to UV light and harmful weather exposure as required by manufacturer.
2. Protect air and water barrier from contact with incompatible materials and sealants not approved by air and water barrier manufacturer.

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

C. Remove masking materials after installation.

END OF SECTION