

**SECTION 07155  
FLUID-APPLIED MEMBRANE AIR BARRIERS (AWB)**

**PART 1: GENERAL**

**1.1. GENERAL REQUIREMENTS**

- A. The General Conditions, Supplementary Conditions, Instructions to Bidders, and Division 01- General Requirements shall be read in conjunction with and govern this section.
- B. The Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete Work of any trade. The Contractor is solely responsible to make clear to the Subcontractor the extent of their Work.

**1.2. SUMMARY**

- A. This Section includes requirements for supplying labor, materials, tools, and equipment to complete the Work as shown on the Drawings Architectural Division as specified herein including, but not limited to, the following:
  - 1. Adhesives/Primers
  - 2. Fluid Applied, Vapor Permeable Air & Water Barrier Membrane
  - 3. Transition Membranes
  - 4. Sealant
  - 5. Thru-wall flashing
  - 6. Insulation Adhesive (Optional)

**1.3. RELATED REQUIREMENTS**

- A. DIVISION 03 – Concrete Section 03300 Cast-In-Place Concrete
- B. DIVISION 04 – Masonry Section 04221 – Concrete Masonry Building
- C. DIVISION 04 – Masonry Section 04300 – Masonry and Architectural Cast Stone Sills, Bands, and Trim
- D. DIVISION 07 – Thermal and Moisture Protection Section 07155 – Damp proofing
- E. DIVISION 07 – Thermal and Moisture Protection Section 07600 - Sheet Metal Flashing
- F. DIVISION 07 – Thermal and Moisture Protection Section 07951 – Caulking and Sealants
- G. DIVISION 09 – Finishes Section 09260 Gypsum Board Systems

**1.4. ALTERNATES**

- A. Primary membranes defined as Water Resistive Coatings are only considered acceptable substitutions when installed in conjunction with EIFS in accordance with ICC-ES AC 212 and are not considered acceptable substitutions for wall assemblies with alternate claddings.
- B. Submit requests for alternates in accordance with documents.

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- C. Alternate submission format to include:
  - 1. Evidence that alternate materials meet or exceed performance characteristics of product requirements and documentation from an approved independent testing laboratory certifying that the performance of the system including auxiliary components exceed the requirements of the local building code.
  - 2. References clearly indicating that the Air Barrier Manufacturer has successfully completed projects of similar scope and nature on an annual basis for a minimum of ten (10) years.
  - 3. Air Barrier Manufacturer's guide specification.
  - 4. Air Barrier Manufacturer's complete set of technical data sheets for assembly.
  - 5. Air Barrier Manufacturer's complete set of details for assembly.
  - 6. Product certification that the assembly components are supplied and warranted by single source Air Barrier Manufacturer.
  - 7. Sample warranty as specified.
- D. Submit requests for alternates to this specification a minimum of ten (10) working days prior to bid date. Include a list of twenty-five (25) projects executed over the past five (5) years.
- E. Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to tender closing shall not be permitted for use on this project.

1.5. REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AMMA 2400-02, Standard Practice for Installation of Windows with a Mounting Flange in Stud Frame Construction
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM D412, Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers - Tension
  - 2. ASTM D471, Standard Test Method for Rubber Property - Effect of Liquids
  - 3. ASTM D1970, Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
  - 4. ASTM D2243, Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings
  - 5. ASTM D5590, Standard Test Method for Determining the Resistance of Paint Films and Related Coatings to Fungal Defacement by Accelerated Four-Week Agar Plate Assay
  - 6. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials
  - 7. ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials
  - 8. ASTM E283, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
  - 9. ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
  - 10. ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
  - 11. ASTM E1354, Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
  - 12. ASTM E1677, Standard Specification for Air Barrier (AB) Material or System for Low-Rise Framed Building Walls

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13. ASTM E2112, Standard Practice for Installation of Exterior Windows, Doors and Skylights
14. ASTM E2178, Standard Test Method for Air Permeance of Building Materials
15. ASTM E2357, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

1.6. ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
  1. Coordinate the Work of this Section with the installation of exterior substrate. Sequence Work so that installation of fluid-applied air barrier coincides with installation of substrate preparation without causing delay to the Work.
- B. Pre-installation meetings:
  1. When required, and with prior notice, an Air Barrier Manufacturer representative will meet with the necessary parties at the jobsite to review and discuss project conditions as it relates to the integrity of the assembly.

1.7. SUBMITTALS

- A. Provide the following requested information in accordance with Section 01300 Submittals.
- B. Action Submittals:
  1. Product Data:
    - a. Air Barrier Manufacturer's guide specification.
    - b. Air Barrier Manufacturer's complete set of technical data sheets for assembly.
    - c. Air Barrier Manufacturer's complete set of standard detail drawings.
  2. Certificates:
    - a. Product certification that the assembly components are supplied and warranted by single source Air Barrier Manufacturer.
    - b. Statement that installing contractor is authorized by Air Barrier Manufacturer to complete Work as specified.
  3. Warranty:
    - a. Sample warranty as specified.

1.8. QUALITY ASSURANCE

- A. Single Source Responsibility:
  1. Obtain fluid-applied membrane air barrier, transition membranes, air barrier sealants, primers, mastics, and adhesives from a single Air Barrier Manufacturer regularly engaged in the manufacturing and supply of the specified products.
  2. Contactor to verify product compliance with federal, state, and local regulations controlling use of Volatile Organic Compounds (VOC).
- B. Manufacturer Qualifications:
  1. Air Barrier Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:
    - a. Air Barrier Manufacturer must not issue warranties for terms longer than they have been manufacturing and supplying specified products for similar scope of Work.
- C. Installer Qualifications:
  1. Perform Work in accordance with Air Barrier Manufacturer published literature and as specified in this section.

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2. Maintain one (1) copy of Air Barrier Manufacturer's instructions on site.
3. At all times during the execution of the Work allow access to site by the Air Barrier Manufacturer representative.
4. If meeting with Air Barrier Manufacturer during project construction, contact Air Barrier Manufacturer a minimum of two weeks prior to schedule meeting.

#### 1.9. DELIVERY, STORAGE, AND HANDLING

- A. Delivery of Materials:
  1. Materials shall be delivered to the jobsite in undamaged and clearly marked containers indicating the name of the Air Barrier Manufacturer and product.
- B. Storage of Materials:
  1. Store materials as recommended by Air Barrier Manufacturer and conforming to applicable safety regulatory agencies. Refer to all applicable data including but not limited to MSDS sheets, Product Data sheets, product labels, and specific instructions for personal protection.
  2. Keep solvents away from open flame or excessive heat.
  3. Products should be stored in closed containers.
  4. Store rolled materials on end in original packaging.
  5. Protect rolls from direct sunlight until ready for use.
  6. Refer to Air Barrier Manufacturer published literature.
- C. Handling:
  1. Refer to Air Barrier Manufacturer published literature.

#### 1.10. SITE CONDITIONS

- A. Environmental Requirements:
  1. No Work shall be performed during rain or inclement weather.
  2. No Work shall be performed on frost or wet covered surfaces.
- B. Protection:
  1. Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane.
- C. Ensure all preparation Work is completed prior to installing fluid-applied membrane air barrier.

#### 1.11. WARRANTY

- A. Manufacturer Material Warranty:
  1. Provide Air Barrier Manufacturer's standard material warranty.

## PART 2: PRODUCTS

### 2.1. MATERIALS MANUFACTURER

- A. Components and auxiliary materials must be obtained as a single-source from the assembly Air Barrier Manufacturer to ensure total system compatibility and integrity.
- B. Acceptable Manufacturers:
  1. Henry Company  
999 N. Sepulveda Blvd. Suite 800  
El Segundo, CA 90245

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(800) 486-1278

[www.Henry.com](http://www.Henry.com)

2. W.R. Meadows – Air-Shield AMP
3. Substitutions: Under provisions of Section 01600 and Instructions to Bidders

## 2.2. MATERIALS

- A. Primary Fluid-Applied Membrane Air Barrier (Basis of Design):
  1. One-component, water-based, elastomeric emulsion membrane, designed to provide a vapor permeable air and water barrier when applied above-grade wall assemblies, having the following properties:
    - a. Basis of Design Product: Air-Bloc 17MR
    - b. Color: Graphite
    - c. Solids Content:
      1. By Weight: 63%
      2. By Volume: 53%
    - d. Service Temperature:
      1. Low Temperature: -40 degrees F (-40 degrees C)
      2. High Temperature: +180 degrees F (+80 degrees C)
    - e. Application Temperature:
      1. Low Temperature: +20 degrees F (-6 degrees C)
      2. High Temperature: +122 degrees F (+50 degrees C)
    - f. Tensile Strength (ASTM D412): 104 psi (717 kPa)
    - g. Elongation (ASTM D412): 420%
    - h. Low Temperature Flexibility @ -22 degrees F (-30 degrees C) (ASTM D1970): Pass
    - i. Freeze-Thaw Resistance (ASTM D2243): Pass; 10 cycles
    - j. Nail Sealability (ASTM D1970): Pass
    - k. VOC Content: 100 grams/liter max.
    - l. Water Absorption (ASTM D471, modified): 5.6%
    - m. Water Vapor Permeance (ASTM E96 B) @ 40 mils nominal dry film: 14 perms
    - n. Air Permeability:
      1. Assembly Air Leakage (ASTM E2357): Pass
      2. Building Material (ASTM E2178): 0.0001 cfm/ft<sup>2</sup> (0.0005 L/s.m<sup>2</sup>)
    - o. Chemical Resistance: Resists salt solutions, mild acids and alkalis. Non-resistant to oils, grease or solvents
    - p. Flame Spread/Smoke Development (ASTM E84): 10/15
    - q. Resistance to Mold, Mildew, and Fungal Growth (ASTM D5590): No growth
- B. Auxiliary Materials
  1. Transition Membranes:
    - a. Liquid applied flashings:
      1. Moisture-curing one component elastomeric liquid applied flashing membrane using a highly advanced STPe (Silyl-Terminated Polyether) polymer, having the following properties:
        - a. Basis of Design Product: Air-Bloc LF
        - b. Color: Blue
        - c. Air Leakage (ASTM E2178): <0.004 L/s/m<sup>2</sup> @ 75Pa
        - d. Water Vapor Permeance (ASTM E96, Method B): 21.8 perms @25 mils
        - e. Air Leakage of Air Barrier Assemblies (ASTM E2357): Pass
        - f. Water Resistance (AC212/ASTM D2247): Pass
        - g. Nail Sealability (AMMA 711): Pass
        - h. Surface Burning Characteristics (ASTM E84):
          1. Class A

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2. Flame Spread/Smoke Development (ASTM E84): 20/5
      - i. Tensile Strength (ASTM D412): 132 psi
      - j. Elongation (ASTM D412): 264%
    - b. Self-Adhering flashings:
      1. Non-vapor permeable, self-adhered water resistive air and vapor barrier membrane consisting of an SBS rubberized asphalt compound, which is integrally laminated to a blue engineered thermoplastic film, having the following properties:
        - a. Basis of Design Product: Blueskin SA
        - b. Color: Blue
        - c. Water Vapor Permeance (ASTM E96, Method A): .86 perms
        - d. Air Leakage of Air Barrier Assemblies (ASTM E2357): Pass
        - e. Air Leakage (ASTM E2178): <0.0005 L/s/m<sup>2</sup> @ 75Pa
        - f. Water Tightness (CAN/CGSB-37.58-M86): Pass.
        - g. Nail Sealability (ASTM D1970): Pass.
        - h. Tensile Strength:
          1. Membrane (ASTM D412-modified): 500 psi minimum
          2. Film (ASTM D828): 5000 psi minimum
        - i. Elongation (ASTM D412-modified): 200% minimum
  2. Sheathing Joint Membranes:
    - a. Vapor permeable, self-adhered water resistive air barrier membrane consisting of an engineered film and patented, permeable adhesive technology with split-back poly-release film, having the following properties:
      1. Basis of Design Product: Blueskin VP160
      2. Color: Blue
      3. Air Leakage (ASTM E2178): <0.02 L/s/m<sup>2</sup> @ 75Pa
      4. Water Vapor Permeance (ASTM E96, Method A): 29 perms
      5. Air Leakage of Air Barrier Assemblies (ASTM E2357): Pass
      6. Resistance to Water Penetration (ICC-ES AC 38): Pass.
      7. Nail Sealability (ASTM D1970): Pass
      8. Surface Burning Characteristics (ASTM E84):
        - a. Class A
        - b. Flame Spread/Smoke Development (ASTM E84): 0/105
      9. Tensile Strength (ASTM D828): 182N MD/129N CD
      10. Cycling and Elongation (ICC-ES AC48): Pass
    - b. Contact Air Barrier Manufacturer for a complete list of authorized transition membranes.
  3. Adhesives and Primers:
    - a. Spray adhesive, and having the following properties:
      1. Basis of Design Product: Blueskin Spray Prep
      2. Color: Clear amber
      3. Solids Content (By Weight): 35%
      4. Aerosol
    - b. Synthetic rubber based adhesive type, quick setting, having the following properties:
      1. Basis of Design Product: Blueskin Adhesive
      2. Color: Blue.
      3. Solids Content (By Weight): 35%.
      4. Solvent based: Maximum VOC: 450 g/L
    - c. Polymer emulsion based adhesive type, quick setting, low VOC content, having the following properties:
      1. Basis of Design Product: Blueskin LVC Adhesive
      2. Color: Blue.
      3. Solids Content (By Weight): 40%.
      4. Solvent based: 240 g/L.
    - d. Polymer emulsion based primer for self-adhered membranes, and having the

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following properties:

1. Basis of Design Product: Aquatac Primer
  2. Color: Aqua.
  3. Solids Content (By Weight): 58%.
  4. Water based: Maximum VOC: 50 g/l
4. Sealants:
- a. Building Envelope Sealant:
    1. Moisture cure, medium modulus polymer modified sealing compound, having the following properties:
      - a. Basis of Design Product: HE925 BES Sealant
      - b. Complies with Fed. Spec. TT-S-00230C, Type II, Class A.
      - c. Complies with ASTM C920, Type S, Grade NS, Class 35.
      - d. Elongation: 450 – 550%.
      - e. Remains flexible with aging.
  - b. Sheathing Joint Sealants:
    1. As recommended by Air Barrier Manufacturer
  - c. Contact Air Barrier Manufacturer for a complete list of authorized sealants.
5. Self-Adhesive Thru-Wall Flashing Membrane:
- a. Non-vapor permeable, self-adhered water resistive air and vapor barrier membrane consisting of an SBS rubberized asphalt compound, which is integrally laminated to a blue engineered thermoplastic film, having the following properties:
    1. Basis of Design Product: Blueskin TWF
    2. Color: Yellow
    3. High Temperature Stability - Flow Resistance (ASTM D5147): Pass
    4. Air leakage (ASTM E283): 0.005 L/s.m<sup>2</sup> @ 75 Pa
    5. Water vapor permeance (ASTM E96, Method B): 0.03 perms
    6. Low temperature flexibility (CGSB 37-GP-56M): Pass
- C. Insulation Adhesive:
1. Synthetic rubber base compound having the following characteristics:
    - a. Basis of Design Product: Air-Bloc 21
    - b. Color: Cream.
    - c. Compatible with air barrier membrane, substrate and insulation materials.
    - d. Long term flexibility (CGSB 71-GP-24M): Pass.
    - e. Chemical resistance: Alkalies, mild acid and salt solutions.

**PART 3: EXECUTION**

**3.1. EXAMINATION**

- A. Substrate Conditions:
1. Verify substrates to receive work and surrounding adjacent surfaces are in accordance with Air Barrier Manufacturer published literature prior to installation of fluid applied membrane air barrier assembly.
  2. Sheathing panels must be securely fastened and installed flush to ensure a continuous substrate in accordance with Air Barrier Manufacturer published literature.
  3. Fastener penetrations must be set flush with sheathing and fastened into solid backing.
  4. Mortar joints in concrete block and form tie holes/voids in poured concrete shall be filled, flush, smooth, and allowed to be cured for a minimum of twenty-four (24) hours.

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5. New concrete should be cured for a minimum of sixteen (16) hours after forms are removed.
  6. Cap and protect exposed back-up walls against wet weather conditions prior to application of fluid applied membrane air barrier assembly.
- B. Notify contractor in writing of any conditions that are not acceptable.
- C. The installing contractor shall examine and determine that surfaces and conditions are ready to accept the Work of this section in accordance with published literature. Commencement of Work or any parts thereof shall mean installer acceptance of the substrate.

3.2. PREPARATION

- A. All surfaces must be sound, dry to touch, clean, and free of oil, grease, dirt, excess mortar, frost, laitance, loose and flaking particles, or other contaminants.
- B. Protect adjacent surfaces not included in scope of Work to prevent spillage and overspray.
- C. Hot weather or direct-sun applications over porous substrates, such as concrete, promote rapid surface drying and can form blisters in the fluid applied membrane air barrier during curing. To aid in blister prevention prepare substrate in accordance with one of the following optional procedures:
1. Prime coat:
    - a. Apply a thin prime coat of fluid applied membrane air barrier to substrate.
    - b. Allow fluid applied membrane air barrier to fully cure prior to subsequent application.
    - c. Install primary fluid applied membrane air barrier to Air Barrier Manufacturer minimum recommended mil thickness.
  2. Two coat:
    - a. Apply fluid applied membrane air barrier to achieve one-half (1/2) of Air Barrier Manufacturer minimum recommended mil thickness.
    - b. Allow fluid applied membrane air barrier to fully cure prior to subsequent application.
    - c. Apply fluid applied membrane air barrier to achieve one-half (1/2) of Air Barrier Manufacturer minimum recommended mil thickness.
    - d. Overall dry mil thickness shall be in accordance with Air Barrier Air Barrier Manufacturer published literature.

3.3. INSTALLATION

- A. Ensure substrate is ready to receive fluid applied membrane air barrier in accordance with published literature.
- B. If fluid applied membrane air barrier should freeze while in storage, move containers to a controlled environment above 32 degrees F (0 degrees C) until thawed and re-mix using a hand operated power mixer prior to use.
- C. Fluid applied membrane air barrier shall not be applied when ambient (air) and substrate temperatures are below 20 degrees F (-6 degrees C).
- D. Do not proceed with application of air barrier membrane when rain is expected within 16 hours.

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- E. Apply sealant at sharp corners, changes in substrate plane, penetrations, and edges to form a smooth transition from one plane to another.
- F. Non-Moving Substrate Joint and Crack Treatment:
  - 1. Gaps equal to or less than 3/8 inch (10 mm) wide:
    - a. Sheathing Joint Sealant:
      - 1. Apply sealant at rate recommended by Air Barrier Manufacturer.
      - 2. Spread sealant at joint extending a minimum one (1) inch beyond gap to ensure a continuous air and watertight assembly.
  - 2. Gaps equal to or less than 1/2 inch (12 mm) wide:
    - a. Building Envelope Sealant:
      - 1. Apply sealant at rate recommended by Air Barrier Manufacturer.
      - 2. Spread sealant at joint extending a minimum one (1) inch on each side of substrate gap.
    - b. Liquid applied flashings:
      - 1. Apply liquid applied flashing at rate recommended by Air Barrier Manufacturer.
      - 2. Apply liquid applied flashing in accordance with Air Barrier Manufacturer published literature extending a minimum of two (2) inches on each side of substrate gap.
    - c. Self-adhering flashings:
      - 1. Apply primer to substrate and allow curing in accordance with published literature prior to installation of self-adhered flashing.
      - 2. Apply self-adhering flashing in accordance with Air Barrier Manufacturer published literature extending a minimum of three (3) inches on each side of substrate gap.
      - 3. Roll membrane with countertop roller to eliminate air pockets between self-adhered flashing and substrate ensuring full adhesion of membrane onto substrate.
      - 4. Seal exposed leading edges of self-adhered membrane with sealant.
  - 3. Gaps greater than 1/2 inch wide:
    - a. Contact Air Barrier Manufacturer.
  - 4. Refer to Air Barrier Manufacturer published literature for a complete list of authorized Non-Moving Substrate Joint and Crack Treatment details.
- G. Moving Joints:
  - 1. Contact Air Barrier Manufacturer.
- H. Refer to Air Barrier Manufacturer detail drawings for installation procedures including, but not limited to, the following:
  - 1. Inside corners
  - 2. Outside corners
  - 3. Crack treatment
  - 4. Penetrations
  - 5. Rough openings
  - 6. Control joints
  - 7. Expansion joints
  - 8. Changes in substrate
- I. Contact Air Barrier Manufacturer to coordinate transition of fluid applied membrane air barrier to adjacent areas including, but not limited to, the following:
  - 1. Roof to air barrier
  - 2. Air barrier to waterproofing
  - 3. Fastener penetrations

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- J. Thru-Wall Flashing:
  - 1. Coordinate with Section [project specific].
- K. Primary Liquid Air Barrier Membrane
  - 1. Install fluid applied membrane air barrier in accordance with Air Barrier Manufacturer published literature to ensure an air and watertight fluid applied membrane air barrier assembly.
  - 2. Fluid applied membrane air barrier assembly must be installed in a monolithic application without sags, runs or voids, and transitioning with auxiliary components to create a uniform drainage plane and air barrier.
  - 3. Install fluid applied membrane air barrier and transition membranes so that subsequent membrane installation laps one (1) inch (2.5 cm) onto existing membrane ensuring an air and watertight fluid applied membrane air barrier assembly.
  - 4. Fluid applied membrane air barrier total dry thickness shall be in accordance with Air Barrier Manufacturer published literature. Refer to Air Barrier Manufacturer Technical Data Sheet.
- L. Insulation Adhesive (Optional):
  - 1. Coordinate with Section [project specific] for insulating materials.
  - 2. Upon curing of the air barrier membrane system apply insulation adhesive in a serpentine pattern.
  - 3. Immediately embed insulation into the adhesive and press firmly into place to ensure full contact. Apply additional adhesive if allowed to skin over.
  - 4. Fully butter all joints of insulation panels with adhesive during installation, with the exception of expansion joints.

### 3.4. FIELD QUALITY CONTROL

- A. Final Observation and Verification:
  - 1. Final inspection of fluid applied membrane air barrier assembly shall be carried out by the Owner's representative, the contractor, or Air Barrier Manufacturer as required by warranty.
  - 2. Contact Air Barrier Manufacturer for warranty issuance requirements.
- B. Fluid applied membrane air barrier assembly is not designed for permanent UV exposure. Refer to Air Barrier Manufacturer published literature for product limitations.

### 3.5. CLEANING

- A. Promptly as the Work proceeds, and upon completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing Work.
- B. Clean soiled surfaces, spatters, and damage caused by Work of this Section.
- C. Check area to ensure cleanliness and remove debris, equipment, and excess material from the site.

END OF SECTION 07272

SECTION 07175  
WATER REPELLENT COATING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish and install water repellent coating to all new exterior masonry and cast stone surfaces.

1.02 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacture of water repellent coatings.
- B. Applicator: Acceptable to manufacturer.

1.03 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Include details of product description, tests performed, limitations to coating , cautionary procedures required during application, and chemical properties, including percentage of solids.
- C. Submit manufacturer's installation instructions under provisions of Section 01300.
- D. Submit manufacturer's certificate under provisions of Section 01400 that coating meets or exceeds specified requirements.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply coating when ambient surface temperature is lower than 40 degrees F or higher than 200 degree F and per manufacturers recommendations.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Protectosil CHEM-TRETE 40 VOC, Evonik Industries
- B. Hydrozo Clear 40 VOC by Degussa Building Systems.
- C. Substitutions: Refer to Article 4.3 - Instructions to Bidders and Section 01600 - Materials and Equipment

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Verify joint sealants are installed and cured.
- B. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of coating.
- C. Beginning of installation means acceptance of substrate.

### 3.02 PREPARATION

- A. Remove loose particles and foreign matter.
- B. Remove oil or foreign substance with a chemical solvent which will not affect coating.
- C. Scrub and rinse surfaces with water and let dry.
- D. Protect adjacent surfaces not scheduled to receive coating.
- E. If applied on unscheduled surfaces, remove immediately, by approved method.
- F. Protect Landscaping, property, and vehicles.

### 3.03 APPLICATION

- A. Delay work until masonry mortar, concrete substrate is cured a minimum of 60 days.
- B. Apply coating in accordance with manufacturer's instructions.

END OF SECTION

SECTION 07210  
BUILDING INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Sound Batt insulation in walls & ceilings.
- B. Batt insulation as indicated on Drawings and/or as specified herein.
- C. Furnish and install drainable insulation as indicated on drawings and as specified herein.

1.02. SUBMITTALS

- A. Submit manufacturer's installation instructions and product literature under provisions of Section 01300.
- B. Submit 2 samples of each type of insulation. (Samples size: 6" x 6" minimum.)
- C. Submit 2 samples of each type of fastener proposed and recommended by manufacturer.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - BATT INSULATION

- A. Batt Insulation
  - 1 Owens/Corning Fiberglas, Unfaced
  - 2. Manville Fiberglass- Unfaced
  - 3. CertainTeed Fiberglass - Unfaced
  - 4. Substitutions: Under provisions of Section 01600 and Instructions to Bidders

2.02 BATT INSULATION

- A. Unfaced fiberglass blankets (exterior walls only): The manufacturer's certified "R: factor designation shall be shown on the product packages or on the product.
  - 1. Thickness: 3-1/2" inches at interior walls only . "R" Value: 13 for 3-1/2" inch thick insulation.
  - 2. Thickness: 6-1/4" inches at exterior walls. "R" Value: 19.
  - 3. Thickness: 9-1/2" at **ceilings**. "R" Value: 30 . (Only as indicated on Drawings.)
- B. Testing Information
  - 1. Flame Spread Classification: 25
  - 2. Smoke Developed Classification: 50 or less
  - 3. Fuel Contributed Classification: 25 or less
  - 4. Testing; ASTM E-84-68, UL 723, NFPA 255.

## 2.03 SOUND ATTENUATION BATTS

- A. Unfaced mineral wool fiber blanket insulation produced by combining mineral fibers.
- B. Materials to comply with ASTM C 665 for Type I .
- C. Thickness: 3-1/2" min.

## 2.04 CONTINUOUS EXTERIOR WALL INSULATION: MINERAL FIBER BLOCK AND BOARD THERMAL INSULATION

- A. Product: Equal to Cavityrock by ROCKWOOL - [www.rockwool.com](http://www.rockwool.com).
- B. Overall Thickness: **1 1/2"**
- C. R-Value: 4.2/inch
- D. Accessories: Provide all accessories as recommended by manufacturer for complete installation.

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. Verify adjacent materials are dry and ready to receive installation.
- B. Verify mechanical and electrical services within walls have been installed and tested.

### 3.02 INSTALLATION OF BATT INSULATION

- A. Install batt insulation in accordance with manufacturer's instructions.
- B. Install batt insulation, in exterior walls and ceiling spaces without gaps or voids and as indicated on drawings.
- C. Trim insulation neatly to fit spaces. Use batts free of damage.
- D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.
- E. Install insulation with factory applied membrane facing the **exterior side** of building spaces. Lap ends and side flanges of membrane to provide complete system.

### 3.03 INSTALLATION OF DRAINABLE INSULATION: POLYISOCYANURATE INSULATED DRAINAGE SYSTEM

- A. Install per manufacturer's written instructions and recommendations.
- B. Tape all exterior corner conditions.
- C. Coordinate with installation of exterior sheathing and Self-Adhered Sheet Membrane Air Barrier, Vapor Impermeable- Section 07273.

END OF SECTION

SECTION 07212  
BLANKET INSULATION FOR METAL BUILDINGS

**PART 1 – GENERAL**

**1.1 SUMMARY**

- A. Thermal insulation and moisture control system for metal buildings for the following applications:
  - 1. Roofs, with OSHA Compliant, leading-edge fall protection.
- B. Related Sections:
  - 1. Fabricated Engineered Structures.
  - 2. Metal Building Systems.
  - 3. Fire Suppression.
  - 4. Plumbing; Rough-in utilities.
  - 5. HVAC; Rough-in utilities.
  - 6. Electrical; Rough-in utilities.

**1.2 REFERENCES**

- A. American Society for Testing of Materials (ASTM):
  - 1. ASTM C991 - Standard Specification for Flexible Fibrous Glass Insulation for Metal Buildings.
  - 2. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
  - 3. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 4. ASTM E 96 - Standard Test Method for Water Vapor Transmission of Materials in Sheet Form (Procedure A).
  - 5. ASTM E 2178 – Standard Test Method for Air Permeance of Metal Buildings.
- B. North American Insulation Manufacturers Association (NAIMA):
  - 1. NAIMA 202-96(R) (Rev. 2000) STANDARD For Flexible Fiberglass Insulation to be Laminated for Use in Metal Buildings.
- C. National Fire Protection Association (NFPA):
  - 1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- D. Underwriters Laboratories (UL):
  - 1. UL 723 - Test for Surface Burning Characteristics of Building Materials.

**1.3 DESIGN REQUIREMENTS**

- A. Insulation **R-Value of 30** for installed roof system.
- B. The installed roof and wall systems shall provide a continuous vapor barrier.

**1.4 SUBMITTALS**

- A. Product Data: Provide manufacturer's data for each of the following, including:
  - 1. Roof installation instructions.
  - 2. Product data sheet.
  - 3. Design consideration guide.
  - 4. Recycle content certification for fiberglass insulation products – minimum 50% recycled content for all fiberglass insulation materials.
- B. Shop Drawings: Provide shop drawings that indicate the following:
  - 1. Liner fabric layout.
  - 2. Insulation layout and cut list.

3. Customer and project information.

## **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: Companies shall be familiar with the installation practices associated with banded liner systems.

## **1.6 SAFETY PRECAUTIONS**

- A. Installation contractor must have a site-specific safety plan and comply with all OSHA applicable local rules and regulations when installing this system.
- B. Workers must use OSHA required fall protection when installing the banding and fabric system at heights (see OSHA regulations at 29 CFR 1926, Subpart M).
- C. Insulation System shall meet the following:
  1. OSHA 29 CFR 1926.502(c)(4)(i) – Except as provided in paragraph (c)(4)(ii) of this section, safety nets and safety net installations shall be drop-tested at the jobsite after initial installation and before being used as a fall protection system, whenever relocated, after major repair, and at 6-month intervals if left in one place. The drop test shall consist of a 400-pound (180 kg) bag of sand 30" ± 2" (76 cm ± 5 cm) in diameter dropped into the net from the highest walking/working surface at which employees are exposed to fall hazards, but not less than 42" (1.1 m) above that level.
  2. OSHA 29 CFR 1926.502(i)(2) – All other covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment and materials that may be imposed on the cover at any one time.
  3. OSHA 29 CFR 1926.754(e)(3) – covering roof and floor openings.
  4. OSHA 29 CFR 1926.754(e)(3)(i) – Covers for roof and floor openings shall be capable of supporting, without failure, twice the weight of the employees, equipment and materials that may be imposed on the cover at any one time.
- D. Banding has sharp edges. Cut proof gloves should be worn when handling.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Store products indoors or in a dry, covered area.
- B. Do not open products until ready to use.
- C. Protect products from potential construction site damage.
- D. Use care when opening products as pallets may shift during shipment.
- E. Banding has sharp edges. Wear cut proof gloves when handling.
- F. Wear safety glasses when unpacking materials.

## **1.8 PROJECT CONDITIONS**

- A. For best results, do not install this system outside of the temperature, humidity, ventilation, and environmental limits recommended by the manufacturer. Products should be kept covered and dry at temperatures less than 100°F prior to installation.

## **PART 2 – PRODUCTS**

### **2.1 MANUFACTURER**

- A. For the purpose of establishing quality and type products as manufactured by Bay Insulation Systems, Inc., Green Bay, WI, 54311; [www.bayinsulation.com](http://www.bayinsulation.com). Have been specified.
- B. Equal products as manufactured by Thermal Design ([info@thermaldesign.com](mailto:info@thermaldesign.com) Phone 800-255-0776) are approved for bidding.

- C. Substitutions: Per Instructions to Bidders and Section 01600.

## **2.2 MATERIALS**

Note: Bay Insulation Systems shall approve all materials used in the SkyLiner® Insulation System. Contact Bay Insulation for specific materials approved for use within the SkyLiner® Insulation System.

- A. The SkyLiner® System materials:
1. Fabric liner facing/vapor barrier composed of woven high-density polyethylene coated on both sides with polyethylene. Complies with the following:
    - a. ASTM C1136, Types I through VI.
      - 1) Type 1-IV exception for dimensional stability (value is <2.0%).
    - b. Perm rating: 0.02 or 0.03 when tested in accordance with ASTM E 96 Procedure A.
    - c. Flame Spread Index < 25 and Smoke Developed Index < 50 when tested in accordance with ASTM E 84.
    - d. Color:
      - 1) Bright White,
  2. Vapor barrier adhesive. Complies with the following:
    - a. BayGrip™ Contact Adhesive; CA Compliant.
    - b. BayGrip™ Fast Dry Pressure Sensitive Adhesive; CA Compliant.
  3. Double sided vapor barrier tape. Complies with the following:
    - a. SkyLiner Double-Faced Tape.
    - b. 2" width.
  4. Patch tape. Complies with the following:
    - a. SkyLiner Repair Tape.
  5. Metal Banding/Straps. Complies with the following:
    - a. SkyLiner® Banding, 1" x 0.023 continuous length metal banding.
    - b. Exposed color to match vapor barrier.
      - 1) White.
  6. Thermal breaks.
    - a. Closed cell polyethylene foam tape for wall applications. Complies with the following:
      - 1) 0.125" thick to 0.375" thick.
      - 2) 3.0" wide.
    - b. Thermal spacer blocks. Complies with the following:
      - 1) Extruded or expanded polystyrene.
      - 2) Minimum width 3.0".
      - 3) Thickness 0.5" to 1.0".
  7. Fasteners & Clips.
    - a. SkyLiner® Safety Clip System, to include offset clip + fastener + banding, 16" either side of each frame. (Required for fall protection installation.)
    - b. Tek 2 and Tek 4.5.
  8. Insulation Hangars.
    - a. SkyLiner® SkyHook™ for Walls.
    - b. SkyLiner® Insul-Hold for Walls, insulation hangars.

## **PART 3 – EXECUTION**

### **3.1 EXAMINATION**

- A. Examine the areas and conditions under which work of this section will be installed. Verify that adjacent materials are dry and ready to receive insulation. Verify structure, bracing, and concealed building systems

have been tested and inspected.

- B. Provide written report listing conditions detrimental to performance of work in this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Install liner system in accordance with manufacturer's installation instructions and approved shop drawings.
- B. Purlin and girt attachment surfaces should be clean and dry prior to attaching two-faced tape or sealing adhesive.
- C. Installed fiberglass insulation should fit snugly against purlin and girt walls in the cavity space. Avoid gaps, voids, and any excess compression.

### **3.3 CLEANING**

- A. Clean dirt from vapor barrier fabric using a soft cloth with soap and water or non-abrasive household cleaner. Solvent-based cleaners and abrasive pads should be avoided.

**END OF SECTION**

SECTION 07215  
SMOKE/FIRESTOPPING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish and install all materials and accessories required to maintain all fire partitions as indicated on plans (2 hour fire, one hour fire, 2 hour fire and smoke, and one hour fire and smoke partitions only) and as specified herein.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 thru Division 16 of these Specifications.

1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Upon completion of this portion of the Work, complete and post a certificate of insulation compliance in accordance with pertinent requirements of governmental agencies having jurisdiction.

1.03 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01600.

1.04 SUBMITTALS

- A. Submit shop drawings, "UL" System No. & Design No., product data, and manufacturers installation instructions under provisions of Section 01300.
- B. Provide penetration details of all conditions including but not limited to, duct, conduit, cable trays, piping, cable, etc.

PART 2 - PRODUCTS

2.01 SMOKE /FIRESTOPPING MATERIAL - APPROVED MANUFACTURERS

- A. HILTI: phone 800-879-8000.
- B. TREMCO
- C. Spec Seal
- D. Substitutions: under provisions of Section 01600 and Instructions to Bidders.

2.02 OTHER MATERIALS

- A. Pipes, conduits, bus ducts, cables, wires, air ducts, pneumatic tubes and ducts, and similar building service equipment that pass through fire barriers shall be protected as follows:
  - 1. Space between the penetrating item and the fire barrier shall:
    - a. Be filled with a appropriate material capable of maintaining the fire resistance of the fire barrier, or

- b. Be protected by an approved device designed for the specific purpose.
- 2. Where the penetrating item uses a sleeve to penetrate the fire barrier, the sleeve shall be solidly set in the fire barrier, and the space between the item and the sleeve shall:
  - a. Be filled with a material capable of maintaining the fire resistance of the fire barrier, or
  - b. Be protected by an approved device designed for the specific purpose.
- B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

### PART 3 - EXECUTION

#### 3.01 SURFACE CONDITION

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Remove, or protect against, projections in construction framing which may damage or prevent proper insulation.

#### 3.02 INSTALLATION

- A. Install the work of this Section in strict accordance with the original design, requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position.
- B. Fire stops and fire and smoke stops shall be rated for assemblies as indicated on Drawings.

END OF SECTION

SECTION 07216  
GRANULAR INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Granular insulation in cavities of concrete masonry unit walls.
- B. Option: Expanded polystyrene insulation in masonry cavities.

1.02 References

- A. ANSI/ASTM C549 - Perlite Loose Fill Insulation.
- B. ASTM C516 - Vermiculite Loose Fill Insulation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Grace, Zonolite
- B. Perlite Institute, Inc.
- C. **Contractor's Option:** Expanded polystyrene insulation: KORFIL Block Insulation by Concrete Block Insulating Systems, Inc.
- D. Substitutions: Under provisions of Section 01600 and Instructions to Bidders, Article 3.3.

2.02 MATERIALS

- A. Granular Insulation: Vermiculite type or Perlite type, water repellent, fire resistant, flame/fuel/smoke contribution of 0/0/0, in accordance with ANSI/ASTM E84.
- B. **Option:** Expanded polystyrene insulation shall be individually molded to have a minimum density of 1.0 P.C.F., and shall conform to ASTM C578 Standard Type I.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Place granular insulation in walls in accordance with manufacturer's instructions. Verify holes and openings have been sealed to prevent escape of insulation.
- B. Place after masonry materials have sufficiently dried and attained optimum moisture content.
- C. Place as masonry is erected.
- D. Ensure spaces are completely free of mortar to allow free flow of insulation.
- E. Completely fill spaces. Place in lifts and rod to eliminate air pockets. Do not exceed six feet pouring height. Place prior to covering cores with bond beams or lintels.

- F. Place temporary signs in rooms which face insulated walls warning workers to use caution to prevent loss of insulation if cutting into walls.

### 3.02 INSTALLATION OPTION

- A. Inserts shall be installed in the cores of blocks at the Block Producer's Plant so that only blocks with inserts already installed are delivered to the job site.
- B. Inserts shall be properly installed in accordance with manufacturer's specifications to allow blocks to be handled or saw cut without danger of insert dislodgment.

END OF SECTION

SECTION 07600  
SHEET METAL FLASHING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. All Flashings unless specified or noted otherwise.
- B. Installation of lead flashings for vent pipes.

1.02 STANDARDS

- A. Meet requirements and recommendations of applicable portions of Standards listed:
  - 1. American Society for Testing and Materials. ASTM
  - 2. Lead Industries Association. LIA
  - 3. Federal Specifications. FS
- B. Meet the applicable requirements of the "Architectural Sheet Metal Manual" of the Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA) unless exceeded by specific requirements of this Section.

1.03 SUBMITTALS

- A. Shop Drawings shall show locations, markings, quantities, materials sizes, fastenings, and shapes. Indicate by dimensions, locations of sheet metal items. Indicate methods of connecting, anchoring, fastening, bracing and attaching work of other trades. Draw Profiles, Sections, and Views of items especially fabricated for this work at a scale large enough to permit checking for design conformity.
- B. Submit descriptive literature and actual samples of any manufactured item approved during bid period, such as gravel stop system, which varies from that specified and detailed.
- C. Submit in accordance with Section 01300.

1.04 COORDINATION

- A. Coordinate sheet metal work with roofing, insulation, mechanical and related work of other trades.

1.05 WIND REQUIREMENTS

- A. All metal flashing shall be installed to withstand a wind load imposed by a **120 m.p.h. wind**, while remaining in place and meet **IBC 2021** requirements.

1.06 DELIVERY AND STORAGE

- A. Arrange deliveries to provide sufficient quantities to permit continuity of installation of any phase or work. Store to prevent damage to materials or structure.

1.07 WARRANTY

- A. The Contractor for the sheet metal work shall warranty his work in writing free from defects in workmanship for a period of two years after completion, and shall make good all such defects discovered during this period. The warranty, addressed to the Owner, shall be delivered to the Architect.
- B. Material shall be warranted in writing for twenty (20) years non-prorated covering fade, chalking and film integrity - not show a color change greater than 5 NBS color units per ASTM D2244-79. Not show chalking excess of 8 per ASTM D659-80.
- C. This warranty shall include labor and materials through the 20th year.

## PART 2 - PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS - PAINTED SHEET METAL FLASHING

- A. Vincent Metal Goods ColorKlad - *Color selected by architect from no less than 24 colors.*
- B. Pac-Clad (same as above)
- C. Substitutions: See Instructions to Bidders and Section 01600 - Substitutions.

### 2.02 MATERIALS - PAINTED SHEET METAL FLASHING

- A. All materials shall be 24 gauge hot dipped galvanized steel (G-90) commercial quality, extra smooth primed and finished one side with Kynar based fluoropolymer coating 1.0±0.1 mil total dry film thickness unless noted otherwise.
- B. A wash coat of .3-.4 mil dry film thickness shall be applied to the reverse side.
- C. The pre-painted finished side shall be coated with a liquid applied factory installed strippable film for protection of the finished surface during shipping, fabrication and installation.
- D. The material shall be protected from heat and direct sunlight to prevent deterioration of the strippable film and possible finished coating.
- E. **Color as selected by Architect.**

### 2.03 PERFORMANCE CRITERIA - PAINTED SHEET METAL FLASHING

- A. The 70 percent Kynar based finish coating shall conform to the following tests and standards: Hardness-F Minimum NCCA Technical Bulletin 11-12. Adhesion, Cross Hatch- 1/16 inch (no removal): NCCA Technical Bulletin 11-5. Formability, 2T Bend (no cracking or removal): ASTM D522-60 (1973). Reverse Impact, no removal when taped: NCCA Technical Bulletin 11-6 (impact force-70 in. lbs.).
- B. The base metal shall conform to the following tests and standards: Minimum yield: 36,000 PSI ASTM 370-77. Coefficient of Thermal Expansion -  $6.7 \times 10^{-6}$  in/in/F°; ASTM E228-71 (1979), Modulus of Elasticity -  $29 \times 10^6$ , ASTM E111-61 (1978).

### 2.04 SHEET METAL TYPES AND USES

- A. Cap flashing, fascias, gravel stops and cleats, splice plates at gravel stops and cap flashing and equipment curbs: Painted sheet metal.

- B. Expansion joints and cleats, area divider flashing and all other areas not specifically addressed: Pre-painted sheet metal.
- C. Vertical expansion joints and through wall flashing: Pre-painted sheet metal.
- E. Stack projections and plumbing vents: 4# lead.
- F. Roof vents, watertight umbrellas and pitch pockets: Pre-painted sheet metal.

## 2.05 MISCELLANEOUS MATERIALS

- A. Lead: 4# hard lead, containing not less than 3-3/4% nor more than 4-1/4% antimony, not less than 0.07% nor more than 0.10% arsenic and the remainder shall be lead.
- B. Solder: Conform to ASTM B32-70, 60% tin,, and 40% lead used with acid flux of type recommended for stainless steel; except use non-corrosive rosin flux over tinned surfaces.
- C. Nails: Stainless steel, size and type recommended for each application.
- D. Flashing Cement: Asphalt based.
- E. Primer Coating: Asphalt based.
- F. Caulking: See Section 07951.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine surfaces that are to receive sheet metal. Report unsatisfactory conditions.
- B. Do not start installation of sheet metal until unsatisfactory conditions have been corrected.
- C. Proceeding with installation of sheet metal will be construed as evidence of acceptance of conditions under which sheet metal work will be done.
- D. Except as otherwise indicated, comply with SMACNA's "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

### 3.02 CORROSION PROTECTION

- A. Provide positive protection to prevent electrolysis between dissimilar metals used in contact with one another.
- B. Protect metals from corrosion when embedded in, or in contact with other materials.

- C. Coat flanges of sheet metal in contact with roofing with one coat primer coating prior to installing.

### 3.03 SHEET METAL

- A. Install all shop and job fabricated flashing according to details and approved Shop Drawings or the SMACMA manual.
- B. Fabricate sections up to 10 feet long in one piece. Fold all exposed edges back.
- C. Install flashing items as necessary to obtain weathertight condition.
- D. Leave 1/2 inch gap at end joints and install 18 inches long cover plates set in roofing cement.
- E. Solder all corner joints. (Inside and outside corners)
- F. Form all sheet metal accurately to the dimensions and shapes required, finishing all molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit and soldering securely.
- G. Unless otherwise specifically permitted by the Architect, turn all exposed edges back 1/2 inch.
- H. Expansion: Form, fabricate, and install all sheet metal so as to adequately provide for expansion and contraction in the finished work.
- I. Weatherproofing: Finish watertight and weathertight where so required.
- J. Make all lock seam work flat and true to line, and sweated full of solder.
- K. Make all lock seams and lap seams, when soldered, at least 1/2 inch wide.
- L. Where lap seams are not soldered, lap according to pitch but in no case less than 3 inches.
- M. Make all flat and lap seams in direction of flow.

### 3.04 INSTALLATION OF PAINTED SHEET METAL

- A. Colorclad shall be cut, formed, or riveted using hand or power tools. Fabricate and install in accordance with drawing and specification using recognized sheet metal practices.
- B. Keep cutting edges sharp, clean, properly dressed and closely aligned. Exercise care during fabrication and erection to avoid damage.
- C. Use color matched touch-up paint and rivets where required.
- D. Coating must be mechanically removed if soldering is necessary.
- E. All fabrication and installation shall be accomplished with the strippable film in place.
- F. After installation is complete immediately remove strippable film. Extended exposure of strippable film to ultraviolet light may damage paint coating underneath.

### 3.05 NAILING

- A. Wherever possible, secure metal by means of clips or cleats without nailing through the metal.
- B. In general, space all nails, rivets, and screws not more than 8 inches apart and, where exposed to the weather, use lead washers.
- C. For nailing into wood, use barbed roofing nails 1-1/4 inch long by 11 ga. through flat tin discs.

### 3.06 SOLDERING

- A. Thoroughly clean and tin all joint materials prior to soldering.
- B. Perform all soldering slowly in order to heat the seams thoroughly and to completely fill them with solder.
- C. Make all exposed soldering on finished surfaces neat, full flowing, and smooth.
- D. Cleaning: After soldering, thoroughly wash acid flux with a soda solution.

### 3.07 CLEAN-UP

- A. Remove soil, stain, and extraneous materials incidental to sheet metal work from adjacent surfaces. Remove and replace work that cannot be satisfactorily cleaned.
- B. Remove foreign matter and clean sheet metal work to satisfactory conditions to receive specified finish.
- C. For sheet metal work to receive no further finish, clean and protect exposed surfaces to present a neat, uniform and specified finish on completion of work.
- D. Repair any damaged sheet metal to match adjacent sheet metal work. Remove and replace damaged or defective work that cannot be satisfactorily repaired. Repairs that appear obvious as a patch will not be acceptable

END OF SECTION

SECTION 07605  
THRU-WALL FLASHING (DAMP COURSE)

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Thru-Wall Flashing shall be provided at Door Lintels, Window Lintels and Sills, Base of Walls, Wall Lintels, and as indicated on Drawings and as required to maintain positive drainage from within walls to the exterior.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Description: Electrolytic sheet copper, bonded on both sides and edges to asphalt saturated cotton fabric with ductile asphalt mastic, full sheet crimped 3 oz or 5 oz copper coated with flexible asphalt: Cop-A-Cote by Afco Products  
ACC by Phoenix Building Products  
Copper Seal by York Manufacturing
- B. Mastic: Asphaltic type as recommended by flashing manufacturer.  
Manufacturers:
  - 1. Plascal Corp.
  - 2. Nevastrol

PART 3 - EXECUTION

3.01 INSTALLATION OF THRU-WALL FLASHING

- A. All surfaces to be flashed shall be clean and dry.
- B. Lay flashing material in a slurry of fresh mortar topped with a full bed of mortar.
- C. Start flashing 1/2 inch from outside face of wall. Turn flashing up as detailed and secure in reglet where reglets are called for on Drawings. Coordinate work with masonry work.
- D. Carry flashing 6 inches beyond steel lintels at heads. Turn flashing up to divert water at heads & sills.
- E. When membrane flashing makes level changes and turns at corners, tightly place flashing material against surface it is protecting and secure in place with mastic. Provide weeps over flashing at 24 inches o.c.
- F. Use mastic on all vertical surfaces and wherever required to hold flashing material in place.

3.02 CLEANING

- A. Remove all soil and stain from adjacent surfaces caused by membrane flashing work. Dispose of excess materials and debris away from site. Remove and replace all defective flashing.

END OF SECTION

SECTION 07951  
CAULKING AND SEALANTS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Interior and exterior caulking.

1.02 SUBMITTALS

- A. Samples: Submit for selection by Architect, samples of caulking compound for each color required. Prepare sample joint where directed by Architect/Engineer before using caulking compound of color selected; work shall be done in accordance with the approved sample.
- B. Manufacturer's Recommendations: Submit two copies of manufacturer's written recommendations for use and installation of each product used. Keep one copy of each on Project site when caulking and sealing is in progress.

1.03 DELIVERY AND STORAGE

- A. Deliver packaged materials to site in manufacturer's original, unopened, labeled containers.
- B. Arrange deliveries to provide sufficient quantities as necessary to permit continuity of any phase of work.
- C. Store and handle caulking and sealing items to prevent damage to materials or work in place.

1.04 WARRANTY

- A. Warranty this work in writing against defects in materials and workmanship for a period of one year from date of acceptance of Project.

1.05 WEATHER CONDITIONS

- A. Do not proceed with caulking and sealing under adverse weather conditions, or when temperatures are above or below manufacturer's recommended limitations for installation or excessive moisture is present.
- B. Proceed with this work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength, and so sealant will not be subjected to excessive elongation and bond stresses.

PART 2 - PRODUCTS

2.01 MATERIALS - GENERAL

- A. Exterior Caulking Compound: One-component, silicone sealant. Colors as selected by Architect. The following are approved for bidding, all others require pre-bid approval per 3.3 of Instructions to Bidders and Section 01600 Material and Equipment - Substitutions.
  - 1. Omniseal: by Sonneborn
  - 2. 795 by Dow Corning Corp.
  - 3. Silpurf 2000 by G.E.

- B. Interior Caulking Compound: Latex-rubber-modified, acrylic-emulsion-polymer sealant, permanently flexible, non-staining and non-bleeding. The following are approved. All others require pre-bid approval per 3.3 of Instructions to Bidders and Section 01600 Material and Equipment - Substitutions.
  - 1. Ac-20 Acrylic Latex, manufactured by Pecora Chemical Corp.
  - 2. Chem-Calk 600, manufactured by Woodmont Products, Inc.
  - 3. Sonolac, manufactured by Sonneborn.
- C. Back-Up for Joints in Hollow Metal and Aluminum Frames: Resilient type such as resilient foam rod, sponge rubber hose or rod stock, or supporting type such as cork or non-impregnated fiber board.
- D. Back-Up Material for Joints in Masonry, Precast Concrete and Natural Stone Panels and Use at Joints Between Dissimilar Materials:

Resilient, open cell foam rod, or approved equal.
- E. Caulking Primer: As recommended by manufacturer of caulking compound.
- F. Bond Breakers: Polyethylene tape, or equal as recommended by manufacturer of caulking compound.

### PART 3 - EXECUTION

#### 3.01 WORKMANSHIP

- A. Employ only qualified workmen, skilled in this type of work.

#### 3.02 EXAMINATION

- A. Examine surfaces that are to be caulked. Report unsatisfactory conditions. Before beginning caulking make sure clear liquid sealers used on precast concrete panels have been mechanically removed from all surfaces which are to receive caulking compounds.
- B. Do not start caulking until unsatisfactory conditions have been corrected.
- C. Proceeding with installation of caulking will be construed as evidence of acceptance of conditions under which work will be done.

#### 3.03 PROTECTION

- A. Protect adjacent surfaces from damage, soiling and adhering of compound.
- B. Protect caulked surfaces from scratching, scraping and puncturing.

#### 3.04 PREPARATION

- A. Properly prepare joints and surfaces to receive caulking compound. Mask or protect as necessary to prevent smearing adjacent surfaces.
- B. Remove dust, soil, moisture, rust, grease and loose foreign materials that could interfere with caulking.
- C. Rake mortared or grouted joints requiring caulking as necessary to obtain minimum of 1/4 inch for caulking. Maintain caulking width of not more than dimension indicated.
- D. Complete caulking before finish painting is started.

### 3.05 INSTALLATION

- A. Comply with compound manufacturer's printed installation recommendations except where more stringent requirements are shown on Drawings or specified.
- B. Prior to applying caulking compound, clean and prime all joint surfaces in accordance with manufacturer's recommendations.
- C. Apply bond breakers where specified and wherever required by manufacturer's recommendations to ensure that compound will perform properly.
- D. Pack joints with specified backer as required. Install specified gaskets and other materials as detailed.
- E. Apply compound with gun having nozzles of proper size and shape for joint required. Use sufficient pressure to fill all of joint leaving no voids. Superficial pointing of joints with a slim bead will not be accepted. Do not permit excess caulking or priming material to remain on exposed faces of adjacent surfaces. Do not trim edges of caulking with knife or instrument after joints have been tooled.
- F. Finish joints to a slightly concave surface, unless specified or shown otherwise.
- G. Remove excess caulking and leave surface of applied compound neat, smooth and clean. All caulked joints  
  
shall be watertight and conform in size and shape to that indicated on Drawings or as required to render the building watertight.
- H. Use only colors matching approved samples.

### 3.06 CAULKING JOINTS IN EXTERIOR SURFACES

- A. Apply bond breakers where required to prevent adhesion of compound to back of joint.
- B. Pack joints where a suitable backing has not been provided with specified backing material of proper dimensions, to allow for the correct balance of joint and compound dimensions. Regulate joint width to depth proportions generally as follows:

#### WIDTH

#### DEPTH

1/4"(-) 1/4"

1/4" to 1/2" Same as width dimension

1/2" to 1"1/2"

1" (+)Half of width dimension

- C. Install caulking compound as specified under "Installing" above.

### 3.07 CAULKING PERIMETER JOINTS IN EXTERIOR DOORS AND WINDOWS

- A. Pack joints more than 1/2 inch deep and joints not properly backed with specified backing material to 1/4 inch of adjacent surface.
- B. Caulk both sides of frame. Provide completely weathertight joint securely adhered to frame and surrounding surface. Set threshold, saddles, and sills in non-sag compound.
- C. Install caulking compound as specified under "Installing" above.

3.09 CLEAN-UP

- A. Remove soil, stain and extraneous material, caused by caulking work, from adjacent surfaces. Use only solvents or cleaning agents recommended in writing by caulking compound manufacturer.
- B. Repair or remove and replace damaged, defective or sloppy work.
- C. Remove and replace adjacent work that cannot be satisfactorily cleaned.

END OF SECTION