

DIVISION 07

THERMAL AND MOISTURE PROTECTION

SECTION 07 1113
BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Bituminous Dampproofing: Installed on exterior concrete block walls behind masonry veneer.

1.02 RELATED REQUIREMENTS

- A. Section 04 2000 - Unit Masonry

1.03 REFERENCE STANDARDS

- A. ASTM D 1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 1995 (Reapproved 2000).
- B. ASTM D 2822 - Standard Specification for Asphalt Roof Cement; 1991 (Reapproved 1997).
- C. NRCA ML104 - The NRCA Roofing and Waterproofing; National Roofing Contractors Association; Fifth Edition.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide properties of primer, bitumen, and mastics.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Installer Qualifications: Company specializing in performing the work of this section.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sonneborn Waterproofing Systems; Product Sonoshield, Hydrocide 600.

2.02 COLD ASPHALTIC MATERIALS

- A. Bitumen: Emulsified asphalt, ASTM D 1227; with fiber reinforcement other than asbestos (Type II).
 - 1. Comply with ASTM D1227-95, Type S, Class 1.
 - 2. 50% solids by volume
 - 3. 52% solids by weight
 - 4. Viscosity: Stomer methods, 95-105
 - 5. Coverage: 70-100 sq. ft. per gallon
- B. Asphalt Primer: ASTM D41, compatible with substrate.
- C. Sealing Mastic: Asphalt roof cement, ASTM D2822, Type I.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- C. Verify items which penetrate surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

- A. Protect adjacent surfaces not designated to receive dampproofing.

- B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
 - 1. Surface to be free of oil, grease, dirt, laitance and loose material.
- C. Do not apply dampproofing to surfaces unacceptable to manufacturer.
- D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.

3.03 APPLICATION

- A. Prime surfaces in accordance with manufacturer's instructions, if required.
- B. Apply bitumen in one coat, continuous and uniform, at a rate of one gal/100 sq ft.
- C. Seal items projecting through dampproofing surface with mastic. Seal watertight.

END OF SECTION

SECTION 07 1900
WATER REPELLENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water repellents applied to exterior masonry surfaces.
 - 1. Locations as indicated on the drawings.

1.02 RELATED REQUIREMENTS

- A. Section 04 2000 - Unit Masonry
- B. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS

- A. ASTM D 5095 - Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes, and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments; 1991 (Reapproved 2002).
- B. ASTM D3278 - Standard Test Methods for Flash Point of Liquids.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide product description.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section.
- B. Installer Qualifications: Company specializing in performing the work of this section.

1.06 MOCK-UP

- A. Prepare a representative surface 48 x 48 inch in size using specified materials and preparation and application methods on surfaces identical to those to be coated; approved mock-up constitutes standard for workmanship.
- B. Locate where directed by architect in non-conspicuous location.
- C. Mockup may remain as part of the Work.

1.07 FIELD CONDITIONS

- A. Protect liquid materials from freezing.
- B. Do not apply water repellent when ambient temperature is lower than 50 degrees F or higher than 100 degrees F.

1.08 WARRANTY

- A. Installer's two year guarantee against defects, water penetrations, efflorescence, discoloring, etc.
- B. Manufacturer's ten year non-prorated labor and materials warranty for moisture penetration.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Water Repellents:
 - 1. "Weather Seal Siloxane WB" as manufactured by Prosoco, Inc., Kansas City, Kansas.
 - 2. "Enviroseal Clear Double 7" as manufactured by Hydrozo, Inc.

2.02 MATERIALS

- A. Water Repellent: Non-glossy, colorless, penetrating, water-vapor-permeable, non-yellowing sealer, that dries invisibly leaving appearance of substrate unchanged.
 - 1. Applications: Vertical surfaces and non-traffic horizontal surfaces.

- B. Water Repellent: Solvent-free blend of silanes and oligomeric alkoxy siloxanes.
 - 1. Form: Clear amber liquid.
 - 2. Specific Gravity: .96
 - 3. Active Content: 100%
 - 4. pH: Not applicable.
 - 5. Weight/Gallon: 7.9 lbs.
 - 6. Flash Point: 69 degrees F (21 degrees C) concentrate ASTM D 3278
 - a. 140 degrees F (60 degrees C) in 1:9 dilution
 - b. 145 degrees F (62 degrees C) in 1:14 dilution
 - 7. Freeze Point: < -22 degrees F (<-30 degrees C)
 - 8. VOC Content: Complies with national, state, and district AIM VOC regulations at recommended dilutions. Low VOC per ASTM D5095.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify joint sealants are installed and cured.
- C. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of water repellent.

3.02 PREPARATION

- A. Prepare surfaces to be coated as recommended by water repellent manufacturer for best results.
- B. Do not start work until masonry mortar substrate is cured a minimum of 60 days.
- C. Remove loose particles and foreign matter.

3.03 APPLICATION

- A. Apply water repellent in accordance with manufacturer's instructions, using procedures and application methods recommended for best results.
 - 1. Follow manufacturer's recommended dilution ratios.
- B. Vertical Application Instructions
 - 1. For best results, apply diluted protective treatment "wet-on-wet" to a visibly dry and absorbent surface.
 - 2. Alternate application methods.
 - a. Spray: Saturate from the bottom up, creating a 4" to 8" (15 to 20 cm) rundown below the spray contact point. Let the first application penetrate for 2-3 minutes. Resaturate. Less material will be needed for the second application.
 - b. Brush or Roller: Saturate Uniformly. Let diluted protective treatment penetrate for 2 to 3 minutes. Brush out heavy runs and drips that do not penetrate.
- C. Product must be applied within 24 hours of dilution for maximum effectiveness.
 - 1. Product should be applied within 8 hours of dilution.

3.04 PROTECTION OF ADJACENT WORK

- A. Protect adjacent landscaping, property, and vehicles from drips and overspray.
- B. Protect adjacent surfaces not intended to receive water repellent.
- C. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.

END OF SECTION

SECTION 07 5200

MEMBRANE ROOFING – MODIFIED BITUMINOUS

PART 1 GENERAL

1.01 SUMMARY

- A. Furnish and install elastomeric sheet roofing system, including:
 - 1. Roofing manufacturer's requirements for the specified warranty.
 - 2. Preparation of roofing substrates.
 - 3. Wood nailers for roofing attachment.
 - 4. Insulation.
 - 5. Cover boards.
 - 6. Modified bitumen roofing.
 - 7. Metal roof edging and copings.
 - 8. Flashings.
 - 9. Other roofing-related items specified or indicated on the drawings or otherwise necessary to provide a complete weatherproof roofing system.
- B. This project is a complete tear off. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- C. Comply with the published recommendations and instructions of the roofing membrane manufacturer, at <http://manual.fsbp.com>.
- D. Commencement of work by the Contractor shall constitute acknowledgement by the Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

1.02 RELATED SECTIONS

- A. Section 02 4100 - Demolition
- B. Section 06 1000 - Rough Carpentry: Wood nailers associated with roofing and roof insulation.
- C. Section 07 6200 - Sheet Metal Flashing and Trim: Formed metal flashing and trim items associated with roofing.

1.03 REFERENCES

- A. Referenced Standards: These standards form part of this specification only to the extent they are referenced as specification requirements.
- B. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2004.
- C. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2005.
- D. ASTM D 1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials; 2005a.
- E. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2000.
- F. ASTM D 6163 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements; 2000.
- G. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified

Bituminous Sheet Materials Using Polyester Reinforcements; 2000.

- H. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- I. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2004.
- J. CAN-ULC-S770 - Standard Test Method Determination of L-Term Thermal Resistance Of Closed-Cell Thermal Insulating Foams; 2003.
- K. PS 1 - Construction and Industrial Plywood; 1995.
- L. PS 20 - American Softwood Lumber Standard; 2005.
- M. FM DS 1-28 – Wind Design; Factory Mutual Research Corporation; 2007.

1.04 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 for definition of terms related to roofing work not otherwise defined in the section.
- B. LTTR: Long Term Thermal Resistance, as defined by CAN-ULC S770.

1.05 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog data for membrane and bitumen materials, base flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and mechanical fastener layout, edge details, terminations, penetrations, drains and any other relevant details.
- D. Samples: Submit two samples 3 x 5 inches in size illustrating granule surfaced sheet and insulation.
- E. Manufacturer's qualification data.
- F. Installer's qualification data.
 - 1. Letter attesting that roofing contractor is currently licensed by the manufacturer.
- G. Manufacturer's Installation Instructions: Indicate special procedures.
- H. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- I. Manufacturer's Field Reports: Indicate procedures followed.
- J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
 - 1. Maintain one copy on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section.
- C. Installer Qualifications: Company specializing in performing the work of this section.
 - 1. Roofing contractors performing work under this section must be familiar with the specified requirements and methods needed for proper performance of the work of this section. Installer shall be approved by the roof materials manufacturer and be a licensed applicator of the specified system prior to the bidding of this project, and have successfully completed a minimum of three projects equal in size and scope to the project specified

herein. Written verification of the installer's status shall be supplied, in writing, by the manufacturer upon request.

2. Proof of Applicator's Qualifications: A photo copy of the manufacturer's current and valid (at least three months prior to the bid date) "Approved Applicator" Certificate.
 3. Installer shall have a fully staffed office within 100 mile of the job site.
 4. Shall have at least \$1,000,000 (One Million Dollars) insurance liability umbrella.
- D. Pre-Installation Conference: Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.
 2. Notify Architect well in advance of meeting.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Store materials clear of ground and moisture with weather protective covering.
- C. Keep combustible materials away from ignition sources.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Installer's Warranty
 1. Terms: Upon completion of all work and as a condition of its acceptance, deliver to the owner a written guarantee signed by the General Contractor and/or the installing subcontractor agreeing to correct all leaks and defects in the roofing system work to the satisfaction of the owner and the manufacturer of the installed roof system. Installer's warranty to be issued on company's printed letterhead.
 2. Time Period: The time period for correction for the roofing system work shall be two (2) years from the date of final acceptance of the roof by the Owner. Sixty (60) days before the end of the two year period, review roof conditions on the site with the owner and all parties concerned and correct all defects in conformance with specifications.
 3. Warranty Repairs: During the correction of work period, the roofing installer shall, upon notice from the owner, make immediate temporary repairs and notify the roofing materials manufacturer, a report made, and, if covered by this guarantee or the roofing manufacturer's guarantee, the roof shall be permanently restored to a watertight condition, all at no cost to the owner.
- C. Manufacturer's Warranty
 1. Type/Term:
 - a. Provide 20 year manufacturer's roofing system limited warranty. Warranty shall include membrane, roof insulation, and all other products supplied by the roofing manufacturer.
 - b. Provide a separate insulation warranty. Warranty term shall coincide with roofing manufacturer's warranty.
 2. Coverage:
 - a. Warranty:
 - 1) Limit of Liability: No dollar limit.
 - 2) Scope of Coverage: Repair any leak in the Modified Bitumen Roofing System caused by the ordinary wear and tear of the elements, manufacturing defect in brand materials, and the workmanship used to install these materials.
 - b. Insulation Warranty:
 - 1) Limit of Liability: No Dollar Limitation

- 2) **Scope of Coverage:** Provide replacement insulation which warps, bows, or destabilizes to the point of causing a roof leak as a result of any manufacturing defect.

D. Installer's Responsibilities:

1. Installer shall notify the roofing materials manufacturer's representatives for attendance at all Pre-Installation Conferences, review the project requirements with the manufacturer's representatives, pay all required fees, secure all required inspections and do all things necessary to secure and deliver to the Owner the specified guarantee from the manufacturer of the approved materials.
2. During the Guarantee Period, the roofing installer shall, upon notice from the owner, have immediate temporary repairs made and notify the roofing manufacturer.
3. During the warranty period, the manufacturer shall, upon written notice from the owner, investigate, report, and if covered by the guarantee, permanently restore roof to watertight conditions under terms of the guarantee within thirty days. Regardless of the cause of the leak or defect, the owner/agency and the roofing manufacturer shall document and correspond as to the problem location and corrective action needed or taken to prevent future similar occurrences.

E. Quality Inspection/Observation

1. **Inspection by Manufacturer:** Provide a final inspection of the roofing system by a technical representative employed by the roofing system manufacturer.
 - a. Technical representative shall not perform any sales functions.
 - b. Contractor shall complete any necessary repairs required for issuance of warranty.

F. Installer's Warranty Signs

1. Provide 10-inch by 12-inch minimum size painted signs made of aluminum with a white background and gloss black letters. Use paint that is compatible with the aluminum. Make the sign to read:
 - a. "DO NOT MAKE REPAIRS OR ALTERATIONS TO THIS ROOF WITHOUT THE WRITTEN APPROVAL FROM THE OWNER OR AUTHORIZED REPRESENTATIVE. THIS ROOF IS MAINTAINED UNTIL (insert the month and two (2) years after date of final acceptance), BY (insert contractor or manufacturer's name, address and telephone number)."
2. Permanently post signs as directed by the owner's representative. Provide at least one (1) sign on each roof with a minimum of two (2) signs per building.

- G. **Metal Roof Edging with Exposed Decorative Fascia:** Provide 20 year warranty for painted finish covering color fade, chalk, and film integrity.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer - Roofing System

1. Firestone Building Products Co: www.firestonebpco.com.
2. Siplast: www.siplast.com.
3. Tamko Roofing Products, Inc: www.tamko.com.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Manufacturer of Insulation and Cover Boards: Same manufacturer as roof membrane.

C. Manufacturer of Metal Roof Edging: Same manufacturer as roof membrane.

1. Metal roof edging products by other manufacturers are not acceptable.
2. Field- or shop-fabricated metal roof edgings are acceptable, but must be covered under the terms and conditions of the roof system warranty.

2.02 ROOFING SYSTEM DESCRIPTION

ROOF AREA 1: CONCRETE DECK- ALL INSULATION WILL BE MOPPED TO THE CONCRETE DECK AND THE MEMBRANES ATTACHED AS SPECIFIED

ROOF AREA 2: TECTUM DECK- ATTACH A FIRESTONE MB BASE SHEET WITH APPROPRIATE FASTENERS. INSULATION AND MEMBRANES WILL THEN BE ATTACHED AS LISTED IN THE SPECIFICATION.

- A. Roofing System:
1. Membrane: SBS modified bitumen, 2 ply.
 2. Thickness: As specified elsewhere.
 3. Membrane Attachment: Top ply in Cold Adhesive, base ply and insulation installed in type IV hot asphalt.
 4. Slope: Deck is sloped but not enough; provide additional slope of 1/4 inch per foot (1:48) by means of tapered insulation.
 5. Comply with applicable local building code requirements.
 6. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
 7. Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM DS 1-28 and 1-29, and meeting minimum requirements of FM 1-90 wind uplift rating.
- B. Insulation:
1. Total R Value: 20, minimum. Base layer of 3" Iso with a 1/4" per foot tapered system indicated on plans to promote positive drainage
 2. Tapered: Slope as indicated; provide minimum R-value at thinnest point; place tapered layer on bottom.
 3. Base Layer: Polyisocyanurate foam board, non-composite.
 - a. Attachment: hot asphalt. (type IV asphalt)
- NOTE: ROOF AREA 2 WHERE TECTUM DECK IS PRESENT WILL REQUIRE 1/8" PER FOOT TAPERED SYSTEM WITH A 1.5" MIN START DUE TO WINDOW HEIGHTS**
- C. Insulation Cover Board:
1. Type: 1/2" Wood Fiber
 2. Attachment: hot asphalt. (type IV asphalt)

2.03 SBS MODIFIED BITUMEN MATERIALS

NOTE: A FIRESTONE MB GLASS BASE SHEET WILL BE INSTALLED OVER THE TECTUM DECK SECTION PRIOR TO INSTALLING THE INSULATION.

- A. Cap Sheet: Granule surfaced SBS polymer-modified bitumen sheet, ASTM D 6163, Type I, Grade G, with glass fiber reinforcing fabric, formulated for hot asphalt and cold adhesive application with the following additional characteristics:
1. Formulated for hot asphalt and cold adhesive application.
 2. Reinforcing Fabric: Fiberglass
 3. Sheet Width: 3.3 feet (1 m), nominal.
 4. Granule Color: White.
 5. Acceptable Product: SBS Glass FR Cap by Firestone.
- B. Interply Base Sheet: SBS polymer-modified bitumen sheet, complying with ASTM D 6163, Type I, Grade S, with glass fiber reinforcing fabric, formulated for hot asphalt and cold adhesive application to substrate and cap sheet, with the following additional characteristics:
1. Nominal Thickness: 0.087 inch (2.2 mm).
 2. Sheet Width: 3.3 feet (1 m), nominal.

3. Acceptable Product: SBS Base by Firestone.

FLASHING TO BE TWO PLY: SBS BASE AND SBS GLASS FR TORCH

2.04 ASPHALT ROOFING MATERIALS

- A. Asphalt Primer: ASTM D 41, suitable for use on concrete and insulation substrates.
- B. Flashings: Aluminum faced flashing sheet; SBS Metal-Flash AL.
- C. Flashing Cement: Asphalt-based, asbestos-free, complying with ASTM D 4586.
- D. Roof Walkway Pads: Granule surfaced SBS polymer-modified cap sheet.

2.05 ROOF INSULATION AND COVER BOARDS

- A. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C 1289 Type II Class 1, with the following additional characteristics:
 1. Thickness: 3" ISO base layer with ¼" per foot tapered
 2. Size: 48 inches (1220 mm) by 96 inches (2440 mm), nominal.
 - a. Exception: Insulation to be attached using adhesive or asphalt may be no larger than 48 inches (1220 mm) by 48 inches (1220 mm), nominal.
 3. R-Value (LTTR): 20
 4. Compressive Strength: 20 psi (138 kPa) when tested in accordance with ASTM C 1289.
 5. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 6. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.
 7. Acceptable Product: ISO 95+ GL and Tapered Polyisocyanurate Insulation by Firestone.
- B. Wood Fiber Cover Board: Cellulosic fiber insulating board complying with ASTM C 208 Grade 2, surfaced with non-asphaltic coating to reduce asphalt absorption, and with the following additional characteristics:
 1. Size: 48 inches by 96 inches, nominal.
 - a. Exception: Board to be attached using adhesive or asphalt may be no larger than 48 inches by 48 inches, nominal.
 2. Thickness: ½ inch.
- C. Insulation Attachment: Type IV Hot asphalt

2.06 ACCESSORIES

- A. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer.
 1. Fascia Material and Finish: 22 gage, galvanized steel with Kynar 500 finish in manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.
- B. Wood Nailers: PS 20 dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.
 1. Width: 5-1/2 inches (90 mm), nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it.
 2. Thickness: Same as thickness of roof insulation.
- C. Pre-Fabricated Can and edge strips: Asphalt-Impregnated wood fiberboard, compatible with roofing materials.
- D. Sealants: As recommended by membrane manufacturer.

PART 3 INSTALLATION (TEAR OFF DOWN TO STRUCTURAL CONCRETE DECK)

3.01 GENERAL

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- C. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
- D. Perform work using competent and properly equipped personnel.
- E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- F. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (15 to 25 degrees C).
- G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
 - 1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
 - 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 - 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- H. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- I. Consult membrane manufacturer's instructions, container labels, and Material Safety Data Sheets (MSDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.02 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

3.03 PREPARATION

- A. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.
- B. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that

may damage the membrane.

- C. Fill all surface voids in the immediate substrate that are greater than 1/4 inch (6 mm) wide with fill material acceptable insulation to membrane manufacturer.
- D. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.

3.04 INSULATION AND COVER BOARD INSTALLATION

- A. Install insulation in configuration and with attachment method(s) specified in PART 2, under Roofing System.
- B. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- C. Lay roof insulation in courses parallel to roof edges.
- D. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch (6 mm). Fill gaps greater than 1/4 inch (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch (6 mm).
- E. Hot Asphalt Attachment: Apply in accordance with membrane manufacturer's instructions and recommendations

3.05 MODIFIED BITUMEN BASE SHEET INSTALLATION WITH HOT ASPHALT

- A. In air temperature below 50 degrees F, unroll sheets and allow to relax; flatten with broom if necessary to eliminate voids and obtain proper embedment.
- B. Start at the low point with a full width sheet; embed sheets in full mopping of asphalt.
- C. Apply asphalt at rate recommended by roof membrane manufacturer; a minor flow of hot asphalt should be seen coming from the side laps.
- D. Granule Surfaced Sheets: Apply matching granules to areas of asphalt "bleed-out" while the asphalt is still hot.
- E. Complete the entire membrane installation without undue delay.

3.06 MODIFIED BITUMEN CAP SHEET INSTALLATION WITH COLD ADHESIVE

- A. Start at the low point with a full width sheet; embed sheets in full application of cold adhesive.
- B. Maintain one-half sheet stagger between first and second layer; install with minimum 3 inch (75 mm) side laps and 6 inch (150 mm) end laps; keep sheets free of wrinkles, buckles and fish mouths.
- C. Apply adhesive by method and at rate recommended by roof membrane manufacturer.
- D. Heat fuse the side and end laps of all layers, or if approved by manufacturer, laps can be sealed with cold adhesive
- E. Perform heat fusing using a roofing torch or automatic heat welding equipment in accordance with roofing manufacturer's recommendations.
- F. Complete the entire membrane installation without undue delay.

3.07 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.

- B. **Metal Accessories:** Install metal edgings, gravel stops, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
 - 1. Follow roofing manufacturer's instructions.
 - 2. Remove protective plastic surface film immediately before installation.
 - 3. Install water block sealant under the membrane anchorage leg.
 - 4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
 - 5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
- C. **Roofing Expansion Joints:** Install as shown on drawings and as recommended by roofing manufacturer.
- D. **Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces:** Install weathertight flashing at all walls, curbs, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches (200 mm) high above membrane surface.
 - 1. Use the longest practical flashing pieces.
 - 2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
 - 3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
 - 4. Provide termination directly to the vertical substrate as shown on roof drawings.
- E. **Flashing at Penetrations:** Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
 - 1. **Pipes, Round Supports, and Similar Items:** Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.
 - 2. **Pipe Clusters and Unusual Shaped Penetrations:** Provide penetration pocket at least 2 inches deep, with at least 1 inch clearance from penetration, sloped to shed water.
 - 3. **Flexible and Moving Penetrations:** Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.

3.08 FIELD QUALITY CONTROL

- A. **Inspection by Manufacturer:** Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).
- B. Perform all corrections necessary for issuance of warranty.

3.09 CLEANING

- A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
- B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
- C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

3.10 PROTECTION

- A. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings and miscellaneous flashing.
- B. Metal Reglet System

1.02 RELATED REQUIREMENTS

- A. Section 07 5200 – Membrane Roofing – Modified Bituminous
- B. Section 07 6500 - Through-wall flashings in masonry.
- C. Section 07 9005 - Joint Sealers.

1.03 REFERENCES

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process;2009a
- B. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials which may cause discoloration or staining.

1.06 WARRANTY

- A. All sheet metal flashing and trim that is a part of the roofing system is a part of the roof weather-tightness warranty for each type of roofing.
- B. All sheet metal flashing and trim that is part of the wall panel system is a part of the wall panel warranty.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Pre-Finished Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum 24 gauge thick base metal, shop pre-coated with Kynar 500 coating.
- B. Same material as sheet metal roofing.

2.02 REGLET SYSTEMS

- A. Manufacturer: Fry Reglet Corporation, Alhambra, CA, "Springlok" flashing systems.
- B. Type: "MA" masonry reglet
 1. Material: 24 gauge galvanized steel
 2. Finish: Kynar 500 finish
 3. Top Flange: 1-1/2" for brick
 4. Both reglet and flashing to have end lap.

2.03 ACCESSORIES

- A. Fasteners: Lapped and riveted.
- B. Provide all accessories essential to completeness of installation.
- C. Sealant: Type as specified in Section 07 9005.

- D. Provide all clips and concealed fasteners at coping system to make complete installation.

2.04 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Metal flashings shall lap a minimum of 6 inches each joint and shall lap over a bead or brushing of non-setting caulking compound and be riveted.
- D. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- E. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
- F. See details on drawings.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- B. Seal metal joints watertight.
- C. Install metal reglet and flashing system per manufacturer's recommendations with manufacturer approved fasteners.

END OF SECTION

**SECTION 07 6500
FLEXIBLE FLASHING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Laminated metal flashings and counterflashings.
 - 1. Through wall flashing at masonry

1.02 RELATED SECTIONS

- A. Section 04 2000 - Unit Masonry.

1.03 REFERENCES

- A. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Product Data: Manufacturer's data sheets showing product characteristics and including installation instructions.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company with at least five years of successful experience in weathertight installation of flashing.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in manufacturer's sealed containers and packaging, bearing manufacturer's name and product identification.
- B. Stack flashing materials to avoid twisting, bending, and abrasion. Protect materials from weather before installation.
- C. Store mastic materials in sealed containers under cover.

1.07 WARRANTY

- A. To be warranted to be free of defects in manufacture for five (5) years. Material will be provided at no charge to replace any defective product.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer: Sandell Manufacturing Company, Inc; 310 Wayto Rd., Schenectady, NY 12303. ASD. Tel: (518) 357-9757. Fax: (518) 357 9636.
- B. York Manufacturing Inc.; 43 Community Drive, Sanford, Maine 04073. Tel: (800) 551-2828. Fax: (800) 819-2592.
- C. Advanced Building Products, Inc.; P.O. Box 98., Springvale, ME 04083. Tel: (800) 252-2306. Fax: (207) 490-2998.

2.02 MATERIALS

- A. Flexible Flashing: Copper fabric flashing; laminated sheet comprised of copper sheet, asphalt mastic coated on both sides, bonded under pressure between two layers of asphalt saturated, woven glass fabric.
 - 1. Copper weight: 5 oz/sq ft.
 - 2. Size: 36" x 25'-0".
- B. Mastic: Cut-back asphalt containing long fibered material, in trowel grade consistency.
 - 1. Sandell's Trowel Mastic

2.03 FABRICATION

- A. Forming: Fabricate flashings true to shape and accurate in dimension. Form pieces in longest possible lengths to minimize joints. Fold flashing at corners and at ends of pans instead of cutting.
- B. Joints: Provide not less than 4 inches of overlap at flashing joints.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces to receive flashing are thoroughly dry, free from loose materials, and reasonably smooth, with no sharp edges or projections.

3.02 INSTALLATION

- A. General: Comply with recommendations of SMACNA Architectural Sheet Metal Manual.
 - 1. Lap joints minimum of 4 inches and seal watertight with mastic.
 - 2. Carry flashing vertically as detailed, but not less than 8 inches above horizontal plane
 - 3. Extend head and sill flashings not less than 6 inches beyond edges of openings and turn up to form watertight pan; seal with mastic.
- B. Coordination: Interface flashing work with adjacent and adjoining work to ensure best possible weather resistance and durability of completed flashing.
- C. Masonry Flashing: Comply with requirements of sections where masonry installation is specified.
- D. Masonry Flashing: Lay horizontal flashing in slurry of fresh mortar and top with fresh full bed of mortar to receive masonry units. At vertical surfaces, spot flashing with mastic to hold in place until masonry has set.
 - 1. Carry flashing through wall and leave exposed for inspection.
 - 2. After inspection, cut flashing flush with surface of masonry.
 - 3. Remove mortar or other obstructions from weep holes at flashing locations.
 - 4. Flashing around corners to be continuous.
 - 5. Spandrel and Shelf Angles: Entire faces to be flashed.
 - 6. Sills: Place through wall flashing under all sills and from end dam at all terminations to form a continuous water deterrent seal.
 - 7. Flashing at Vertical Supports: When application requires puncturing or slitting, make sure all openings in the flashing are tightly sealed and that that flashing is terminated onto the supports with mastic.
 - 8. Weep Holes: In order to properly drain any water collected from properly applied flashing, weep holes must be provided immediately above the flashing at all flashing locations. In general, weep holes should be ¼" diameter, and should be spaced no further than 24" horizontally.
 - 9. Cleaning of all Excess Mortar: It is also necessary to clean out all excess mortar that may have dropped onto the flashing to ensure clear passage way for water to drain off flashing to the weep holes and out the exterior of the wall.
- E. Installing Flashing: Thru wall flashing membrane is installed at locations requiring flashing to channel water out of cavity wall system through weep holes. If exterior drip edge is required terminate flashing 1" on stainless drip edge. Thru Wall Flashing is installed on base of walls, spandrel beams, ledges, window and door headers and other penetrations/interruptions of wall system. Use of drip edge is strongly recommended where flashing is being installed over a bridge course (to avoid efflorescence) or over concrete masonry (to avoid leaving CMU's holes exposed).

END OF SECTION

SECTION 07 7123
MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Pre-finished metal gutters and downspouts.
- B. Metal Splash Pans

1.02 RELATED REQUIREMENTS

- A. Section 07 5200 – Membrane Roofing – Modified Bituminous
- B. Section 07 6200 - Sheet Metal Flashing and Trim.
- C. Section 32 1750 – Concrete Splash Blocks

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2010.
- B. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- C. ASTM B 209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric; 2014.
- D. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 7th Edition

1.04 DESIGN REQUIREMENTS

- A. Conform to SMACNA Architectural Sheet Metal Manual for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.
- B. Conform to applicable code for size and method of rain water discharge.
- C. Maintain one copy of each document on site.

1.05 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal procedures.
- B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
- C. Product Data: Provide data on prefabricated components.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
- B. Prevent contact with materials that could cause discoloration, staining, or damage.

1.07 PROJECT CONDITIONS

- A. Coordinate the work with downspout discharge pipe inlet.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Metal gutters and downspouts to be same material as used for fascia trim and metal flashings. See Sections 07 5200 and 07 6200.

2.02 COMPONENTS

- A. Gutters: CDA rectangular style profile as shown on the drawings.
- B. Downspouts: CDA Rectangular profile. 4" X 6" ; Provide 45 degree turn out at base.
- C. Anchors and Supports: Profiled to suit gutters and downspouts.
 - 1. Anchoring Devices: In accordance with CDA requirements.

2. Gutter Supports: Brackets.
 3. Downspout Supports: Brackets; minimum three (3) per downspout.
- D. Metal Splash Pan: Size and profile as shown on the drawings. (provide at all downspouts on roof).
1. 0.040" mill finished aluminum.
 2. Compatible metal rivets for fastening angles.
 3. Coordinate height of bottom of downspout to top of splash pan; Downspout to be 1" from bottom of downspout to top of splash pan.
 4. Set splash pan in full bed of mastic to adhere to roof. Verify that method of adhering splash pan does not void warranty.

2.03 FABRICATION

- A. Form gutters and downspouts of profiles and size indicated on drawings.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- D. Hem exposed edges of metal.

2.04 FACTORY FINISHING

- A. Finish equal to "Acrylume" AZ55 as manufactured by Firestone or equal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that surfaces are ready to receive work.

3.02 PREPARATION

- A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

- A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.
- B. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.

END OF SECTION

SECTION 07 9005
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.
- C. Hollow gaskets.

1.02 RELATED REQUIREMENTS

- A. Section 07 6500 - Flexible Flashing: Sealants required in conjunction with through wall flashing.
- B. Section 08 8000 - Glazing: Glazing sealants and accessories.

1.03 REFERENCE STANDARDS

- A. ASTM C 510 - Standard Test Method for Staining and Color Change of Single or Multicomponent Joint Sealers
- B. ASTM C 719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cuclick Movement (Hockman Cycle).
- C. ASTM C 794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
- D. ASTM C 834 - Standard Specification for Latex Sealants; 2010.
- E. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2002.
- F. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005.
- G. ASTM D 1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2000.
- H. ASTM D 1667 - Standard Specification for Flexible Cellular Materials--Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam); 1997.

1.04 SUBMITTALS

- A. See Section 01 3323 - Submittals, for submittal requirements.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section.
- B. Applicator Qualifications: Company specializing in performing the work of this section.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.
 - 1. Install only when atmosphere temperature or joint surface temperature is above 40 degrees F.

1.07 COORDINATION

- A. Coordinate the work with all sections referencing this section.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a three year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sealants
 - 1. Tremco, Sealant/Weatherproofing Division, Beachwood, Ohio. www.tremcosealants.com
 - 2. Dow Corning Corporation, Midland, Michigan
 - 3. Degussa Building Systems/Sonneborn; www.chemrex.com
 - 4. Bostik, Inc.; www.bostik-us.com
 - 5. Pecora Corporation; www.pecora.com

2.02 SEALANTS

- A. Type A - General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component.
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Product: Vulkem manufactured by Tremco.
 - 3. Applications: Use for:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between metal frames and other materials.
- B. Type B - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
 - 1. Product: Butyl Sealant manufactured by Tremco.
 - 2. Applications: Use for:
 - a. Concealed sealant bead in sheet metal work.

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width; "Rescor" manufactured by W. R. Meadows.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- E. Sealant System Backing: "Backer-Rod" as manufactured by W. R. Meadows.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C 1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C 1193.
- C. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
 - 1. Width/depth ratio of 2:1.
 - 2. Neck dimension no greater than 1/3 of the joint width.

- 3. Surface bond area on each side not less than 75 percent of joint width.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.
- H. Apply caulking compound with hand gun having proper sized nozzles to fit joints and with sufficient pressure to completely fill voids and joints.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION

- A. Protect sealants until cured.

3.06 SCHEDULE

- A. Control, Expansion, and Soft Joints in Masonry, and Between Masonry and Adjacent Work: Type A.
- B. Lap Joints in Exterior Sheet Metal Work: Type B.
- C. Any location not listed: According to manufacturer's recommendations.

END OF SECTION