SECTION 07 53 00

EPDM THERMOSET SINGLE-PLY ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. EPDM thermoset single-ply roofing.

B. Membrane flashings.

C. Metal flashings.

D. Roof insulation.

1.2 REFERENCES

A. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures, Current Revision.

B. ANSI/SPRI RP-4 Wind Design Standard For Ballasted Single-ply Roofing Systems.

C. ANSI/SPRI WD-1 Wind Design Standard for Roofing Assemblies.

D. ASTM International (ASTM):
1. ASTM C 208 - Standard Specification for Cellulosic Fiber Insulating Board.
2. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
3. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
4. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
5. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
6. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
7. ASTM D 816 - Standard Test Methods for Rubber Cements.
8. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
9. ASTM D 4637 - Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane.
10. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.

E. Factory Mutual (FM Global):
1. Approval Guide.
   a. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
   b. Loss Prevention Data Sheets 1-28, 1-29.

F. International Code Council (ICC):
1. International Building Code (IBC).

G. National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.

H. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

I. Underwriters Laboratories (UL):
   1. TGFU R1306 - "Roofing Systems and Materials Guide".
   2. UL-790 - Standard Test Method for Fire Tests of Roof Coverings.

J. ANSI/ASHRAE/IESNA Standard 90.1 (2007): Energy Standard for Buildings Except Low-Rise Residential Buildings

1.3 DESIGN CRITERIA

A. Wind Uplift Performance:
   1. Roof system is designed to withstand wind uplift forces per the Massachusetts Building Code as applicable.
   2. Standard 55 MPH wind speed warranty.

B. Fire Resistance Performance:
   1. Roof system will achieve a UL Class A rating when tested in accordance with UL-790.
   2. Roof system will achieve a UL Class B rating when tested in accordance with UL-790.
   3. Roof system will achieve a UL Class C rating when tested in accordance with UL-790.

C. Thermal Performance: Roof system will achieve a minimum R value not less than 18.

D. Drainage: Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.

E. Building Codes:
   1. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Detail Drawings:
   1. Submit approved plan, section, elevation or isometric drawings which detail the appropriate methods for all flashing conditions found on the project.
   2. Coordinate approved drawings with locations found on the Contract Drawings.

D. Selection Samples: For each finish product specified, two complete sets of chips representing manufacturer's full range of available colors, membranes, and thicknesses.

E. Verification Samples: For each finish product specified, two samples, minimum size 4 inches (100 mm) square representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: All products specified in this section will be supplied by a single manufacturer with a minimum of twenty (20) years experience.

B. Installer Qualifications:
   1. All products listed in this section are to be installed by a single installer with a

minimum of five (10) years demonstrated experience in installing products of the same type and scope as specified.

2. Installer must be capable of extending the Manufacturer's Labor and Materials guarantee.
3. Installer must be capable of extending the Manufacturer's No Dollar Limit guarantee.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation, installation techniques and workmanship.

1. Do not proceed with remaining work until workmanship, color, and sheen are approved by the Town of Bridgewater.
2. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Safety Data Sheets (SDS) must be on location at all times during the transportation, storage and application of materials.

C. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.

D. When loading materials onto the roof, applicator must exercise caution to prevent overloading and possible disturbance to the building structure.

E. Proceed with roofing work only when weather conditions are in compliance with the manufacturer’s recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer’s requirements and recommendations.

F. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.

G. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.

H. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.

I. New roofing shall be complete and weathertight at the end of the workday.

J. Contaminants such as grease, fats, and oils shall not be allowed to come in direct contact with the roofing membrane.

1.8 WARRANTY

A. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's Total-System warranty, outlining its terms, conditions, and exclusions from coverage.
   1. 5 years.
   2. 10 years.
   3. 15 years.
   4. 20 years.
   5. 25 years.
   6. 30 years.
   7. Coverage to be extended to include accidental punctures in accordance with terms stated in the Warranty document.
   8. Coverage to be extended to include damage caused by a maximum 1 inch (25 mm) diameter hail in accordance with terms stated in the Warranty document.
   9. Coverage to be extended to include damage caused by a maximum 2 inch (51 mm) diameter hail in accordance with terms stated in the Warranty document.
   10. Coverage to be extended to include roof edge metal water tightness in accordance with terms stated in the Warranty document.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer.

B. Substitutions: Not permitted.

2.2 SCOPE / APPLICATION

A. Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in Design Criteria.

B. Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.

C. Insulation: Provide a roof insulation system beneath the finish membrane.

2.3 MEMBRANE BASE SHEET

A. Base Sheet 1S: A non-asphaltic, resin-bound, fiberglass-reinforced mat, coated on one side with a mineral-filled fire-resistant coating (42 inch wide and 200' long). Designed for use as a suitable substrate for direct application of Mechanically Fastened Roofing Systems over decks requiring a fastened base sheet.** NOTE TO SPECIFIER ** Delete the next paragraph if a Hot Mopped FleeceBACK Roofing System is not specified.

B. Modified Base Sheet: 70-mil smooth surface, self-adhered base ply. Reinforced with a fiberglass mat that is saturated and coated with asphaltic bitumen and SBS elastomer and meets ASTM D6163 Type 1, Grade S. 70 SA is designed to be used as a base ply or interplay in multiple-ply system and can be used as an air and vapor barrier or temporary (up to 60 days) roof. Available in 39-3/8" wide and 61' long (200 square feet) weighing 0.39 lbs per square foot. Chris, is this

2.4 INSULATION

A. Rigid board with glass fiber reinforced facers (GRF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 1.
   1. Compressive Strength: Grade 2 (20 psi) (138 kPa).
   2. Compressive Strength: Grade 3 (25 psi) (173 kPa).
   3. Density: 2 lb per cubic foot (24 kg/cu m) minimum.

B. SecurShield Polyiso: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 2.
   1. Compressive Strength: Grade 2 (20 psi) (138 kPa).
   2. Compressive Strength: Grade 3 (25 psi) (173 kPa).
   3. Density: 2 lb per cubic foot (24 kg/cu m) minimum.
   4. Density (Polyiso): 2 lb per cubic foot (24 kg/cu m) minimum.
   5. Board Thickness: 1/2 inch (13 mm).
   6. Board Thickness: 5/8 inch (15 mm).

C. SecurShield HD Polyiso Cover board: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 4, Grade 1.
   1. Compressive Strength: 80 psi min. (751 kPa).
   2. Board Thickness: 1/2 inch (13 mm).

D. SecurShield HD Plus Polyiso Cover board: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 4, Grade 1. Designed for higher uplift with fewer fasteners per board.
   1. Compressive Strength: 80 psi min. (751 kPa).
   2. Board Thickness: 1/2 inch (13 mm).

E. Any replacement Insulation that matches the existing is acceptable.

2.5 INSULATION ADHESIVE

A. Flexible FAST Adhesive: A spray or extruded applied, two-component polyurethane, low-rise expanding foam adhesive used for attaching approved insulations to compatible substrates (concrete, cellular lightweight insulating concrete, gypsum, cementitious wood fiber, wood or steel) or existing smooth or gravel surfaced BUR, modified bitumen or cap sheets.

B. Flexible FAST Dual Cartridge Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

C. Flexible FAST Dual Tank Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

D. Flexible FAST 5 gallon Jug Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with spray application rigs.

E. OlyBond 500 BA - A two-component, polyurethane, low-rise expanding adhesive used to bond insulation to various substrates using a mechanical dispenser system.

F. OlyBond Spot Shot - A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

G. One-Step: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

2.6 ETHYLENE, PROPYLENE, DIENE TERPOLYMER (EPDM) MEMBRANE

A. Sure-White Non-Reinforced Membrane: Cured, non-reinforced EPDM membrane meeting the requirements of ASTM D 4637 Type I.
   1. Attachment Method: Fully adhered.
   2. Attachment Method: Mechanically fastened.

3. Attachment Method: Ballasted.
4. Color: White on Black.
5. Membrane Thickness: 60 mil nominal.
6. Membrane Thickness: 90 mil nominal.
7. Sheet Dimensions:
    a. Width: 10 feet (3.05 m) maximum.
    b. Width: 16.5 feet (5.0 m) maximum.
    c. Width: 20 feet (6.1 m) maximum.
    d. Length: 100 feet (30.5 m) maximum.
8. Performance:
    a. Tensile Strength: 1685 psi (11.6 MPa) minimum.
    b. Tear Resistance: 200 lbf/in (35 kN/m) minimum.
    c. Elongation: 480 percent.

2.7 FLASHING ACCESSORIES

A. Sure-White (white) Pressure-Sensitive Pipe Seals with Factory-Applied TAPE on the deck flange are available for use with Sure-Seal/Sure-White Roofing systems.

B. Sure-Seal/Sure-White Pressure-Sensitive (PS) Inside/Outside Corner: A 7 inch by 9 inch precut 60-mil thick Elastoform Flashing with a 30-mil Factory-Applied TAPE.

C. Sure-Seal/Sure-White Pressure-Sensitive (PS) Curb Flashing - A 60-mil thick, 20 inch (508 mm) wide cured EPDM membrane with 5 inch (126 mm) wide Factory-Applied Pressure-Sensitive TAPE along one edge to be used to flash curbs/skylights, etc.

D. Sure-Seal 20" pressure-Sensitive Cured Flashing - A 20" wide (508 mm) cured EPDM membrane with Pressure-Sensitive TAPE the full width, factory applied, used to flash curbs/skylights, etc.

E. Sure-Seal/Sure-White Pressure-Sensitive Cured Cover Strip: Sure-Seal or Sure-White 60-mil cured EPDM membrane laminated to a nominal 35-mil cured Factory-Applied TAPE.

F. Sure-Seal/Sure-White Pressure-Sensitive "T" Joint Covers: A factory cut uncured 60-mil thick EPDM flashing laminated to a nominal 35-mil Factory-Applied TAPE, used to overlay field splice intersections and to cover field splices at angle changes. Available in 6 inch by 6 inch and 12 inch by 12 inch for Sure-Seal applications, and 6 inch by 6 inch for Sure-White applications.

G. Sure-Seal/Sure-White Pressure-Sensitive Elastoform Flashing: 60-mil thick uncured EPDM Flashing laminated to a 30-mil Factory-Applied Pressure-Sensitive TAPE used in conjunction with Sure-Seal Primer.

H. Sure-Seal Pressure-Sensitive RUSS (Reinforced Universal Securement Strip):
1. 6 inch (152 mm) RUSS: A nominal 6 inch (152 mm) wide, 45-mil thick reinforced EPDM membrane with a nominal 3 inch (76 mm) wide 30-mil thick cured synthetic rubber pressure-sensitive adhesive laminated to one edge. This product provides perimeter securement, and additional membrane securement at angle changes for Adhered, Ballasted, and Mechanically Fastened Roofing Systems.
2. 9 inch (228 mm) RUSS: A nominal 9 inch (228 mm) wide, 45-mil thick reinforced EPDM membrane with a nominal 3 inch (76 mm) wide 30-mil thick cured synthetic rubber pressure-sensitive adhesive laminated to both edges. This product is used in place of narrow sheets to secure the membrane in the perimeter roof area. The use of this product allows field membrane to be utilized over the entire roof area.

I. Sure-White Pressure-Sensitive RUSS (Reinforced Universal Securement Strip): 6 inch (152 mm) RUSS: A nominal 6 inch (152 mm) wide, 45-mil thick reinforced EPDM membrane with

a nominal 3 inch (76 mm) wide 30-mil thick cured synthetic rubber pressure-sensitive adhesive laminated to one edge. This product provides perimeter securement, and additional membrane securement at angle changes for Adhered, and Mechanically Fastened Roofing Systems.

2.8 CLEANERS, PRIMERS, ADHESIVES AND SEALANTS

1) Weathered Membrane Cleaner: Clear, solvent-based cleaner used to loosen and remove contaminants from the surface of exposed EPDM membrane prior to applying EPDM Primer.

B. Sure-Seal SecurTAPE: 3 inch (76 mm) or 6 inch (152 mm) wide by 100 foot (30.5 M) long splice tape used for splicing adjoining sections of EPDM membrane.

C. Sure-White SecurTAPE: A 3 inch (76 mm) or 6 inch wide (152 mm) wide by 100 foot (30.5 M) long, white colored splice tape used with Sure-White Systems.

D. Sure-Seal HP-250 Primer: A solvent-based primer used to prepare the surface of EPDM membrane for application of Splice Tape or Pressure-Sensitive products.

E. Low VOC EPDM and TPO Primer - A low VOC (volatile organic compound) primer (less than 250 grams/liter) for use with SecurTAPE or Pressure-Sensitive products.

F. Sure-Seal/Sure-White Splicing Cement: A high-strength, butyl-based contact cement which is used for splicing adjoining sections of EPDM membrane (cured or uncured).
1. Sure-Seal Splicing Cement: Black splicing cement for use with Sure-Seal (black) Roofing Systems.
2. Sure-White Splicing Cement: White splicing cement used with Sure-White (white-on-black) Adhered Roofing Systems.

G. Sure-Seal/Sure-White Lap Sealant: A heavy-bodied material (trowel or gun-consistency) used to seal the exposed edges of a membrane splice.
1. Sure-Seal Lap Sealant: Black sealant for use with Sure-Seal (black) Roofing Systems.
2. Sure-White Lap Sealant: White sealant for use with Sure-White (white-on-black) Roofing Systems.

H. 90-8-30A Bonding Adhesive: A high-strength, yellow colored, synthetic rubber adhesive used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.

I. EPDM x-23 Low-VOC Bonding Adhesive: A Low-VOC (volatile organic compound) bonding adhesive (less than 250 grams/liter) used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.

J. Low-VOC Bonding Adhesive: A Low-VOC (volatile organic compound) bonding adhesive (less than 250 grams/liter) used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.

K. Solvent-Free EPDM Bonding Adhesive: A solvent free, odor free, non-flammable, low VOC Bonding Adhesive used to adhere EPDM to multiple substrates. This one-sided application adhesive requires adhesive to be applied to substrate only, when slopes are less than 1". Slopes greater than 1" or vertical substrates may require 2-sided application.

L. Flexible FAST Adhesive: A spray or extruded applied, two-component, polyurethane, low-rise expanding foam adhesive used to securely bond FleeceBACK membranes to a variety of substrates.

M. Flexible FAST Dual Cartridge Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive used to securely bond FleeceBACK membranes to a variety of substrates. The adhesive is extrusion applied 4 inch (102 mm), 6 inch (152 mm) or 12 inch

(305 mm) on center (depending on project conditions) using a portable applicator.

N. Flexible FAST Dual Tank Adhesive: A spray applied, two-component, polyurethane construction grade, low-rise expanding adhesive used to securely bond FleeceBACK membranes to a variety of substrates.

O. Flexible FAST 5-gallon Jug Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with low pressure urethane equipment.

P. Aqua Base 120 Bonding Adhesive: a semi pressure-sensitive water based adhesive. Used as a one-sided, wet lay-in adhesive with Sure-Seal, or Sure-White FleeceBACK 100 or 115 mil membranes or as a two-sided contact adhesive with non-fleece backed Sure-Seal, Sure-Tough, or Sure-White EPDM membranes.

Q. Water Cut-Off Mastic: A one-component, low viscosity, self wetting, Butyl blend mastic used as a compression sealing agent between EPDM membranes and applicable substrates.

R. terminations cannot be completed by the end of each work day. Can also be used for attaching lightning rod bases and ground cable clips to the membrane surface.

S. Sure-Seal/Sure-White One-Part Pourable Sealer: A one-component, moisture curing, elastomeric polyether sealant used as a sealant around hard-to-flash penetrations such as clusters of pipes, and is available in white or black.

T. Universal Single-Ply Sealant: A 100 percent solids, solvent free, one-part, polyether sealant that provides a weather tight sealant to a variety of building substrates; used as a termination bar sealant. Available in white only.

U. CCW 702 Primer and 702LV Primer (Low VOC) - A single component, solvent based, high-tack primer used to provide maximum adhesion between Air and Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 300 to 350 square feet per gallon on smooth finishes (i.e., concrete) to 75 square feet per gallon on porous surfaces (i.e., Dens-Deck Prime gypsum board). Available in 5-gallon containers. CCW 702LV Primer contains less than 250g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.

V. CCW 702 WB - a high-tack, water-based contact adhesive for promoting adhesion of air/vapor barrier membranes and an approved substrate (i.e., concrete, Dens-Deck Prime and Securock). Applied by roller, brush or spray with an application rate of approximately 200 sq. ft. per gallon. Available in 5-gallon containers. CCW 702 WB Primer contains 57g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.

## 2.9 FASTENING COMPONENTS

A. HP Fastener: Threaded, black epoxy electro-deposition coated (E-Coat) fastener for use with steel, wood plank or oriented strand board (OSB).

B. InsulFast Fasteners: Threaded, #12 fastener with #3 Phillips head used with 3 inch (76 mm) diameter Insulation Plates. For insulation attachment into steel or wood decks.

C. Pre-Assembled ASAP Fasteners: InsulFast Fastener and pre-assembled 3 inch (76 mm) diameter Plastic Insulation Plate for insulation attachment on adhered and mechanically-fastened roofing systems.

D. CD-10 Concrete Fastener: A hammer-driven, non-threaded, black epoxy electro-deposition coated (E-Coat) fastener for use with structural concrete decks rated 3,000 psi or greater.

E. HD 14-10 Concrete Fastener: A #14 threaded fastener used for minimum 3,000 psi concrete decks.

F. HP-NTB Fastener: A non-penetrating, plastic fastener and plate for cementitious wood fiber and gypsum.

G. Lite-Deck Fastener: An oversized diameter metal fastener and associated 3 inch diameter Lite-Deck metal plate for use on adhered roofing systems to attach insulation to dense gypsum decks, cementitious wood fiber and lightweight insulating concrete.

H. HP-X Fasteners: Heavy-duty #15 threaded fastener with a Phillips head for adhered assemblies where increased pullout resistance is necessary for steel and wood decks.

I. HP Purlin Fastener: Hex-head, threaded, self-drilling, non-threaded, black epoxy electro-deposition coated (E-Coat) fastener used for membrane/RUSS securement into structural purlins.

J. HP Term Bar Nail-In: A 1 1/4 inch (32 mm) long expansion anchor with threaded drive pin used for fastening Sure-Seal Termination Bar or Seam Fastening Plates to concrete, brick or block walls.

K. Dual Prong Fasteners: A factory pre-assembled, 1.8 inch long fastener consisting of a precision tube formed from galvanized (G-90) coated steel, a 2.7 inch disk formed from Galvalume (AX-55) coated steel and a locking staple of high tensile steel wire used to secure base sheets to fibrous cement, lightweight concrete and gypsum providing 70 pounds of pullout resistance is achieved.

L. HP XTRA: Oversized diameter 0.315 inch (8 mm) steel threaded fastener for use with 22 gauge steel decks for maximum pullout.

M. HP Polymer Seam Plate: A 2 inch (51 mm) diameter plastic barbed fastening plate used for membrane and Pressure-Sensitive RUSS securement for Mechanically Fastened Roofing Systems over steel roof decks.

N. HP XTRA Polymer Seam Plates: 2 3/8 inch (61 mm) diameter plastic fastening plate with barbs on the underside, allowing a wider fastening pattern while maintaining pullout resistance.

O. Seam Fastening Plate: 2 inch (51 mm) diameter metal plate for insulation, membrane and RUSS attachment.

P. Insulation Fastening Plate: Nominal 3 inch (76 mm) diameter FM approved metal plate used for insulation attachment.

Q. Polymer Batten Bar: A 1 inch wide by 0.05 inch thick (25 mm x 1.3 mm) polymer bar pre-punched 6 inches (152 mm) on center for membrane securement.

R. Sure-Seal Metal Fastening Bar: 1 inch by 10 foot long (25 mm x 3048 mm) Galvalume-coated steel fastening bar pre-punched 6 inches (152 mm) on center for membrane securement on Mechanically Fastened Roofing Systems.

2.10 EDGINGS AND TERMINATIONS

A. SecurEdge 200: A snap-on edge system consisting of a 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.

B. SecurEdge 300: A 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.

C. SecurEdge 400: A 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.

D. SecurEdge 2000: An anchor bar roof edge fascia system consisting of 0.100 inch (2.5 mm) thick extruded aluminum bar, corrosion resistant stainless steel fasteners and snap-on fascia cover.

E. SecurEdge 3000: A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and aluminum or 24 gauge steel snap-on fascia cover.

F. SecurEdge 4000: A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and aluminum or 24 gauge steel snap-on fascia cover.

G. Sure-Seal Drip Edge: A 22 gauge pre-punched 90-degree angle cleat and 12 foot (3658 mm) long fascia sections. Kynar 500 or aluminum finish as noted on the Finish Schedule of the Contract Drawings.

H. SecurEdge 200 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.

I. SecurEdge 300 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.

J. SecurEdge 400 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.

K. Sure-Seal Ballast Retaining Bar: A ballast retaining perimeter securement system comprised of a slotted extruded aluminum retention bar with integrated compression fastening strip.

L. Sure-Seal Termination Bar: 1 inch (13 mm) wide, .098 inch (2.5 mm) thick extruded aluminum bar pre-punched 6 inches (152 mm) on center with sealant ledge to support Lap Sealant.

M. SecurEdge Term Bar Fascia: A 1.75" wide formed aluminum termination bar with pre-slotted fastening holes for ease of locating and installing. The decorative cover is available in 0.040" aluminum or 24-gauge galvanized steel. SecurEdge Term Bar Fascia is manufactured in 12' lengths for fewer joints/seams, fewer sections to handle and faster installation.
    a. Panel Thickness: 1.21 inches (30.1 mm).
    b. Water Flow Rate: 75 gpm/ sf in accordance with ASTM D 4491.

PART 3

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Do not commence work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.

D. A vapor retarder / temporary roof may be applied to protect the inside of the structure prior to the roof system installation.

3.3 INSULATION - SYSTEM DESIGN

A. Base Layer:
1. Type: Match Existing
2. Thickness Match Existing
3. Attachment Method Match Existing

B.
1. Top Layer:
2. Type Match Existing
3. Thickness Match Existing
4. Attachment Method Match Existing

C. Tapered System:
1. Type Match Existing
2. Field Slope Match Existing
3. Sump Slope Match Existing
4. Cricket Slope Match Existing
5. Attachment Method: Match Existing

3.4 INSULATION PLACEMENT

A. Install insulation or membrane underlayment in multiple layers over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch (6 mm). Stagger joints both horizontally and vertically.

B. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive in accordance with the manufacturer's current application guidelines.

C. Do not install wet, damaged or warped insulation boards.

D. Stagger joints in one direction unless joints are to be taped. Install insulation boards snug. Gaps between board joints shall not exceed 1/4 inch (6 mm). Fill all gaps in excess of 1/4

E. Wood nailers must be at least 3 1/2 inches (89 mm) wide or 1 inch (25 mm) wider than adjacent metal flange. Thickness must equal that of insulation but not less than 1 inch (25 mm) thickness.

F. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.

G. Do not install any more insulation than will be completely waterproofed each day.

3.5 INSULATION ATTACHMENT

A. Securely attach insulation to the roof deck for Adhered or Mechanically Fastened Roofing Systems. Attachment must have been successfully tested to meet or exceed the calculated uplift pressure required by the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

B. Enhance the perimeter and corner areas in accordance with the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

C. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm) board size, in a full and uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/sm). Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm).

D. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm), applied with adhesive, coverage rate as necessary to achieve the specified attachment and uplift rating. Press each board firmly into place after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a weighted roller. Add temporary weight and use relief cuts to ensure boards are well adhered. Stagger the joints of additional layers by a minimum of 6 inches (152 mm).

E. For ballast attachment loose lay insulation. Where necessary, minimal fastening may be performed to inhibit movement. Fastening plates will require an overlayment of small sections of cured reinforced EPDM membrane in conjunction with Lap Sealant to cover the fastener head and insulation fastening plate.

3.6 WOOD SLEEPER

A. Contractor shall furnish all labor, materials, and equipment needed to remove, dispose and replace any portion of the wood sleeper experiencing dry rot.

B. The estimated amount of wood sleeper requiring replacement is 20 linear feet. Any portion of the wood sleeper in excess of 20 linear feet requiring replacement shall be performed on a time and material basis.

C. Contractor shall notify the Town 48 hours in advance of replacing any portion of the wood sleeper in excess of 20 linear feet to verify necessity and amount of wood sleeper installed in excess of 20 linear feet.

3.7 MEMBRANE PLACEMENT AND ATTACHMENT (Fully Adhered)

A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.

B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.

C. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.

D. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.

E. Install adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

3.8 MEMBRANE PLACEMENT AND ATTACHMENT

A. Position and unroll successive sheets and align to provide for a minimum 3 inch (76 mm) wide splice.

B. Fold adjacent sheets in half lengthwise to expose an approximate 10 foot (3046 mm) wide substrate area.

C. Membrane which will have the adjacent sheet spliced over it should be adhered to the substrate first. In this fashion, selvage edge splice area will not be contaminated by setting splice edge into the FAST or Flexible FAST Adhesive.

D. Spray or extrude FAST or Flexible FAST Adhesive onto the substrate and allow to foam up approximately 1/8 inch (3 mm). Wait for the adhesive to achieve "string" when a small object is lifted out if the adhesive.

E. Place the membrane into adhesive after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a 150 lb (68 kg) segmented weighted roller.

F. Apply FAST Adhesive to the substrate and continue process described above until all sheets are fully bonded, allowing for necessary splice overlaps at selvage edges. At end laps (along the width of the sheet) membrane shall be butted together which will be overlaid with 6 inch wide Pressure-Sensitive Cured Cover Strip or Pressure-Sensitive Overlayment Strip.

3.9 MEMBRANE PLACEMENT AND ATTACHMENT (Mechanically Attached)

A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour prior to attachment. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.

B. Secure the membrane along the pre-printed blue line approximately 3 inches (76 mm) from the edge of the membrane sheet with the required Sure-Seal Fastener and Polymer Seam Plate or Seam Fastening Plate spaced a maximum of 12 inches (305 mm) on center. The minimum distance between the edge of the fastening plate and the edge of the membrane must be 2 inches (51 mm).

C. As an alternate to the use of fastening plates, Sure-Seal Metal Fastening Bars may be used for membrane securement.

D. Position adjoining field membrane sheets to allow a minimum overlap of 6 inches at locations where Fastening Plates are located (along the length of the membrane); at the same time overlap end roll sections (width of the membrane) a minimum of 3 inches.

3.10 MEMBRANE PLACEMENT AND ATTACHMENT (Ballast Applied)

A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour prior to splicing.

B. Install adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

3.11 MEMBRANE PLACEMENT AND ATTACHMENT (Asphalt Adhered)

A. General:
   1. Store membrane in a dry area to prevent absorption of moisture in the fleece backing. If moisture is present, it must be removed with a wet-vac system and the membrane must be allowed to fully dry prior to membrane adhesion.

2. The temperature of the asphalt during application shall be within 25 F (4 C) from the Equiviscous Temperature (EVT). The manufacturer's heating instructions (i.e., maximum heating temperature, prolonged storage temperature guidelines) must be strictly followed.
3. Apply asphalt at a coverage rate of 18-22 pounds per square (100 square feet). It is important that "heavy spots" of asphalt, typically occurring at mopping overlaps or where the mop is first positioned, be avoided. At these areas, the asphalt must be spread evenly to avoid a heavy coverage rate that can cause asphalt saturation of the fleece backing. Asphalt saturation of the fleece must be avoided.
4. If spreaders are used to apply asphalt, care must be taken to ensure the proper coverage rate is maintained. Do not overlap asphalt layers at multiple pass lines since the heavy coverage rate occurring at these overlapping areas must be avoided.
5. Mopping the membrane directly to Polyisocyanurate insulation is not permitted.

B. When positioning membrane along the length for tape or adhesive splices, allow the fleece backing to extend approximately 1/2 inch (13 mm) above adjoining membrane to avoid direct contact between EPDM membrane and hot asphalt.

C. When using a mop to apply asphalt, position the membrane over the substrate overlapping adjacent sheets to accommodate membrane splicing and fold in half lengthwise to expose the substrate and the back side of the membrane (full width of the membrane by approximately half the length).

D. Beginning at the membrane fold, apply asphalt to the full width of the membrane extending a maximum of 3 to 6 feet while rolling the membrane into the asphalt immediately. The asphalt temperature at the time of membrane adhesion must be above 350 F (176.7 C). Continue to apply asphalt for the full width of the membrane extending 3 to 6 feet (914 - 1828 mm) at a time while embedding the membrane into the asphalt until the entire half of the sheet is adhered. Fold back the unbonded half of the membrane and repeat the bonding procedures identified above.

E. When using spreaders to apply asphalt, the membrane is folded widthwise dependent on the size of the spreader (36 to 57 inches wide); i.e., if a 36 inch wide spreader is used, the membrane will be folded to expose approximately a 36 inch wide by 50 foot long area. After the asphalt is applied in a single pass, the membrane is rolled into the asphalt. After mopping the membrane, apply asphalt to the remaining substrate area in single passes and continue to bond membrane as identified above.
1. Membrane must be embedded into asphalt immediately after each spreader pass to ensure asphalt temperature is at least 350 F (176.7 C) at the time of membrane embedment.
2. Take care that the asphalt is not dropped directly on the back of the membrane. Use a mop to spread asphalt at pass lines and under sheet folds to prevent a heavy coverage rate.

F. After membrane mopping, immediately after adhesion, brush down the sheet with a soft bristled broom using light to medium pressure. Do not use weighted rollers or heavy pressure when brooming the membrane to avoid asphalt saturation of the fleece.

3.12 MEMBRANE SPLICING (Adhesive Splice)

A. Fold the top sheet back and clean the dry splice area (minimum 3 inches wide) of both membrane sheets by scrubbing with clean natural fiber rags saturated with Splice Cleaner or HP-250 Primer. When using Sure-Seal (black) PRE-KLEENED membrane, cleaning the splice area is not required unless contaminated with field dirt or other residue.

B. Apply Splicing Cement in accordance with the manufacturer's current application guidelines, and roll the top sheet onto the mating surface.

C. Roll the splice with a 2 inch wide steel roller and wait at least 2 hours before applying Lap Sealant to the splice edge following the manufacturer's requirements.

D. Field splices without In-Seam Sealant must be overlaid with uncured flashing.

3.13 MEMBRANE SPLICING (Tape Splice)

A. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.

B. Fold the top sheet back and clean the dry splice area (minimum 2 1/2 inches (64 mm wide) of both membrane sheets with Sure-Seal Primer as required by the membrane manufacturer.

C. Where Splice Tape is not Factory-Applied, apply Splice Tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch (13 mm).

D. Remove the release film and press the top sheet onto the tape using hand pressure.

E. Roll the seam toward the splice edge with a 2 inch (51 mm) wide steel roller.

F. Install Pressure-Sensitive "T" Joint Cover, a 6 inch wide (152 mm) section of Pressure-Sensitive Elastoform Flashing over all field splice intersections.

G. When using non-Pressure-Sensitive Elastoform Flashing or Elastoform Flashing, seal edges of flashing with Lap Sealant.

H. The use of Lap Sealant with tape splices is optional except at tape overlaps and cut edges of reinforced membrane where Lap Sealant is required.

3.14 FLASHING

A. Wall and curb flashing shall be cured EPDM membrane. Continue the deck membrane as wall flashing where practicable.

B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.15 BALLASTING

A. Install ballast in accordance with the manufacturer's installation instructions.

B. Install ballast evenly without bare spots to provide complete coverage over the membrane.

C. When specified, overlap HP Protective Mat a minimum of 6 inches prior to ballast or paver installation.

D. Comply with published ANSI (American National Standards Institute) ANSI/SPRI RP-4 guidelines concerning applicable coverage rates.

3.16 WALKWAYS

A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the Contract Drawings.

B. Adhere walkways pads to the EPDM membrane in accordance with the manufacturer's current application guidelines.

3.17 COORDINATION WITH POLICE DEPARTMENT OPERATIONS

A. Contractor to meet with the Police Chief prior to commencing construction to coordinate roofing operations with the Police Department operations.

B. No staging or construction operation shall impede access into the police station building or its paring lot.

3.18 DAILY SEALS

A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the workday, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

B. Use Sure-Seal Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

3.19 CLEAN UP

A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

3.20 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION